REMEDIAL REMOVAL
INTEGRATED INVESTIGATION REPORT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, ORLEANS PARISH, LOUISIANA
VOLUME 4

March 1995

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 6
Dallas, Texas 75202
Contract No. 68-WO-0037

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Dallas, Texas 75201

137648

001160

APPENDIX O

AQUIFER TEST DATA

APPENDIX O

Appendix O presents the results of rising head and falling head slug tests conducted in monitoring wells installed at the Agriculture Street Landfill (ASL) site. Results of the slug tests were used to determine hydraulic conductivity. Both rising head and falling head slug tests were performed in each well as presented in Section 2.5.

Table O-1 summarizes slug test data for the shallow groundwater wells. The hydraulic conductivities for the shallow groundwater wells from both the rising head and falling head data sets were calculated using the method described by Bouwer and Rice (1976). Table O-2 summarizes slug test data for the sand unit wells. Hydraulic conductivities for the sand unit wells from both the rising head and falling head data sets were calculated using the methods described by Bouwer and Rice (1976) and Cooper *et al.* (1967).

Graphic presentations of the hydraulic conductivity solutions for all wells are presented on pages O-13 to O-128. The rising head graphics are labeled with the designation MW001, while the falling head graphics are distinguished from the rising head graphical solutions with an "I" added to the monitoring well designation, such as MW001I. The method used for the solution of each hydraulic conductivity is indicated on each graph. Raw data from the rising head and falling head field tests are presented on pages O-129 to O-327.

Table O-1

**SLUG TEST RESULTS FOR SHALLOW GROUNDWATER WELLS
REMEDIAL REMOVAL INTEGRATED INVESTIGATION
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA**

Monitoring Well	Method	Test	Hydraulic Conductivity (feet/minute)
MW0011	BR	R	0.000032694
	BR	F	0.000033675
MW003	BR	R	0.002147
	BR	F	0.001686
MW005	BR	R	0.000062428
	BR	F	0.000043369
MW007[a]	BR	R	0.0002611
	BR	F	0.004168
MW009	BR	R	0.008924
	BR	F	0.000019757
MW011	BR	R	0.0001344
	BR	F	0.0007956
MW013	BR	R	0.0009649
	BR	F	0.0008607
MW015[a]	BR	R	0.0004999
	NA	F	No value - poor data
MW017	BR	R	0.006869
	BR	F	0.003234
MW019	BR	R	0.001211
	BR	F	0.0006072
MW021[a]	BR	R	0.001072
	BR	F	0.0002388
MW023	BR	R	0.0006257
	BR	F	0.0005577
MW025	BR	R	0.0002482

Key at end of table.

Table O-1

**SLUG TEST RESULTS FOR SHALLOW GROUNDWATER WELLS
REMEDIAL REMOVAL INTEGRATED INVESTIGATION
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA**

Monitoring Well	Method	Test	Hydraulic Conductivity (feet/minute)
	BR	F	0.0004709
MW027[a]	BR	R	0.001898
	BR	F	0.000056589
MW029[a]	BR	R	0.01454
	BR	F	0.01535
MW031[a]	BR	R	0.006466
	BR	F	0.02791
MW033	BR	R	0.002316
	NA	F	No value - poor data
MW036[a]	BR	R	0.001511
	NA	F	No value - poor data
MW038[a]	BR	R	0.001953
	BR	F	0.001039
MW040[a]	BR	R	0.00103
	BR	F	0.001193
MW041	BR	R	0.001197
	BR	F	0.001759
MW043	BR	R	0.001641
	BR	F	0.002456
MW046[a]	BR	R	0.004038
	BR	F	0.008128

Key at end of table.

[a] Well was screened across the water table.

Key:

BR = Bouwer and Rice solution.
F = Falling head test.
NA = Not applicable.
R = Rising head test.

Sources:

Bouwer and Rice, 1976, A Slug Test Method for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells, *Water Resources Research*, Volume 12, No. 3, pp. 423-428.

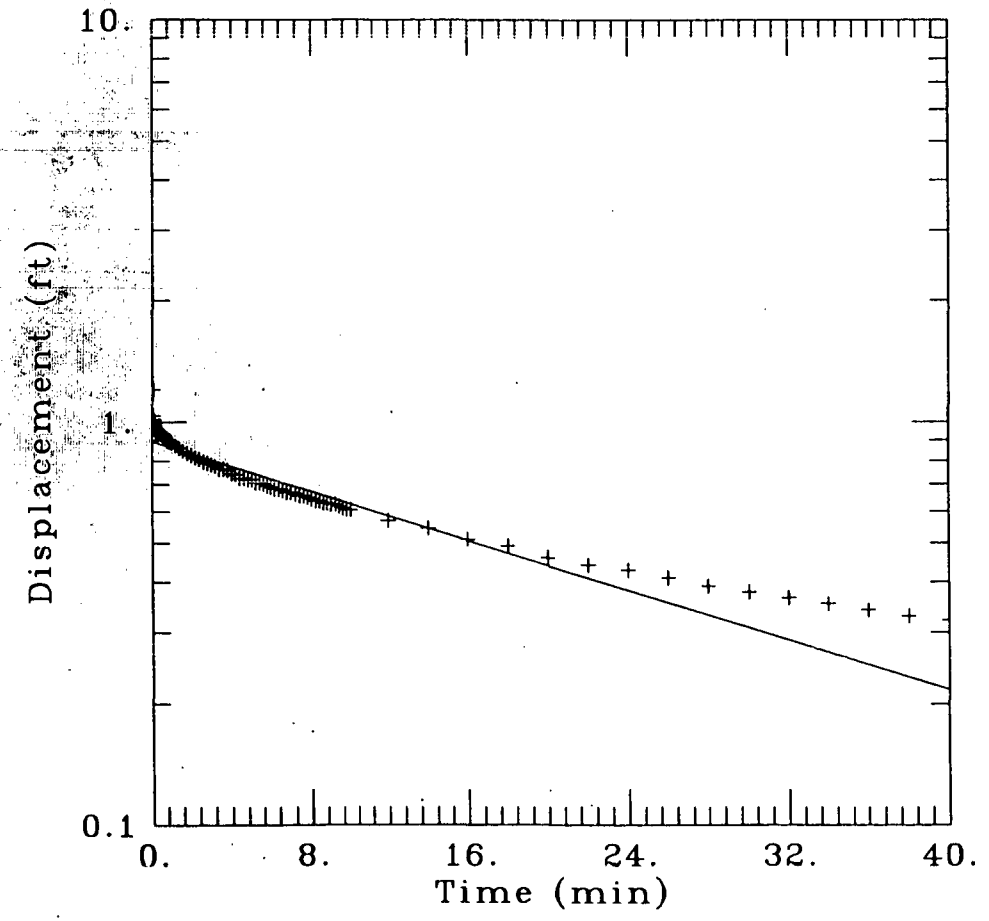
Bouwer, 1989, The Bouwer and Rice Slug Test - An Update, *Groundwater*, Volume 27, No. 3.

Ecology and Environment, Inc., 1994.

001160.0005

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-001



DATA SET:
mw-001a.dat
07/01/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

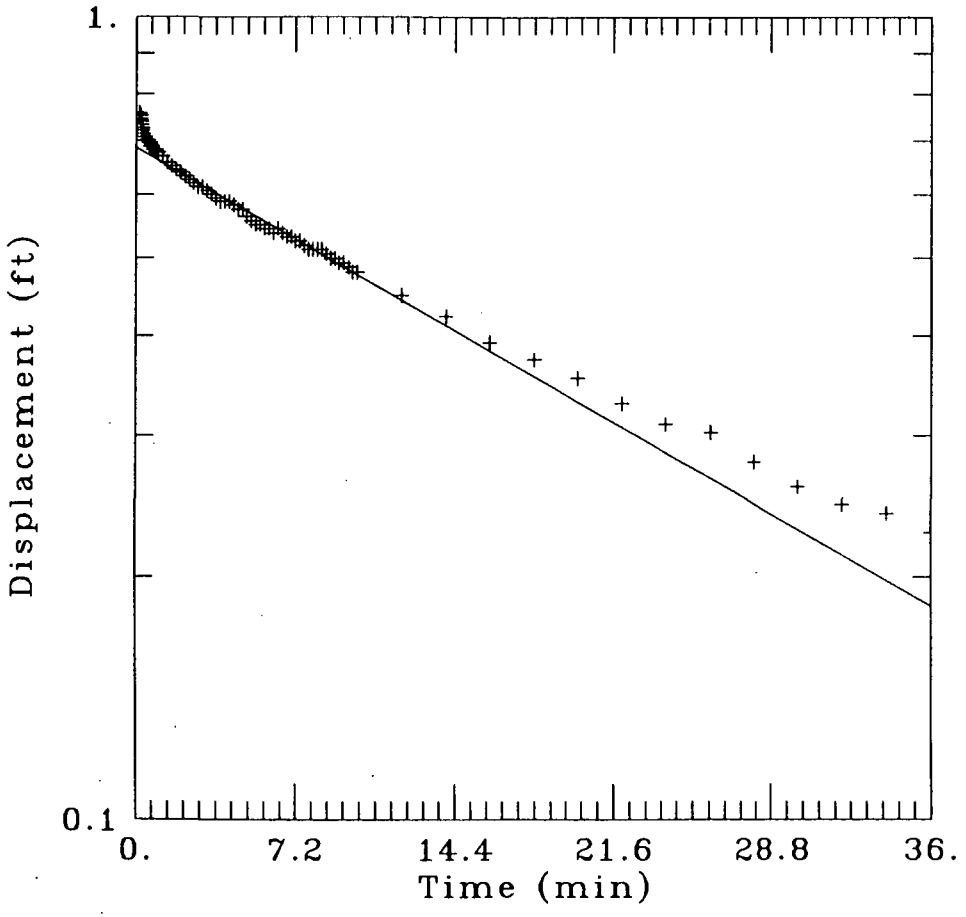
TEST DATE:
24 May 94

ESTIMATED PARAMETERS:
K = 3.2694E-05 ft/min
y0 = 0.8933 ft

TEST DATA:
H0 = 1.202 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.67 ft
H = 11.67 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-001I



DATA SET:
mw-001i.dat
06/21/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 MAY 94

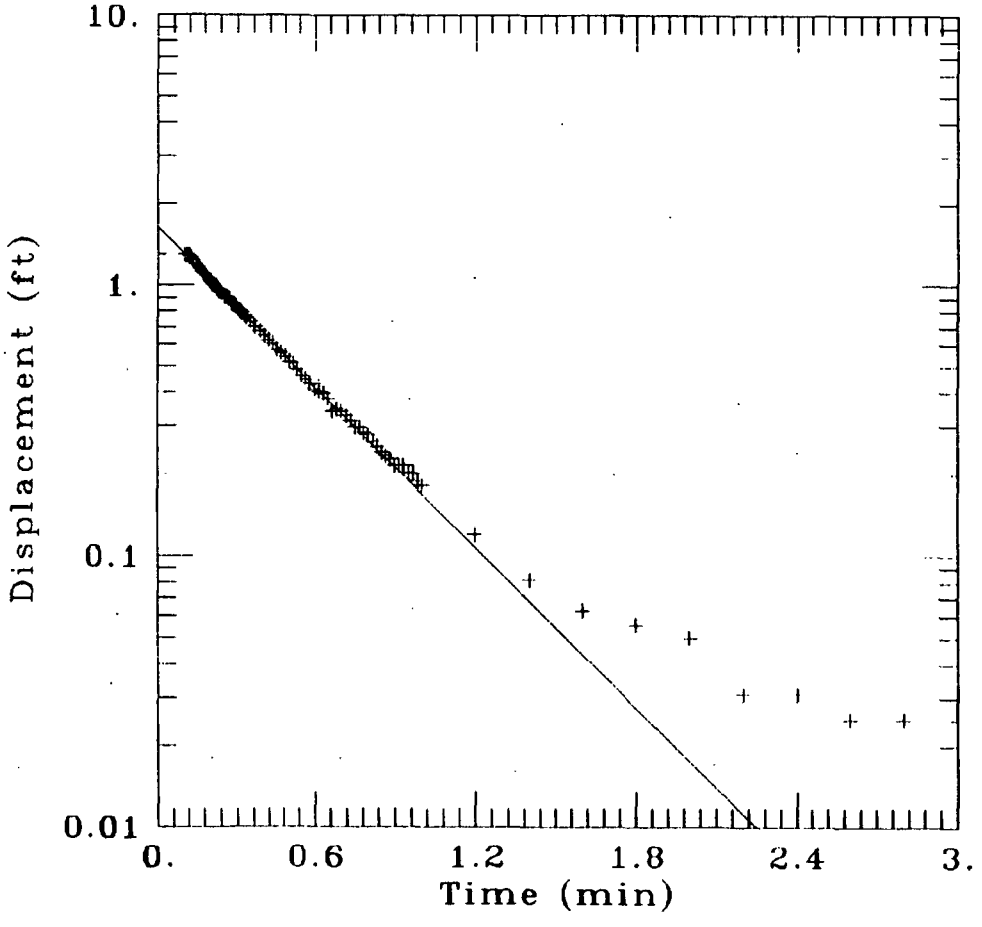
ESTIMATED PARAMETERS:
K = 3.3675E-05 ft/min
y0 = 0.6861 ft

TEST DATA:
H0 = 0.759 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.67 ft
H = 11.67 ft

0011
60.0
007

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-003



DATA SET:
mw 003a dat
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATE:
23 May 94

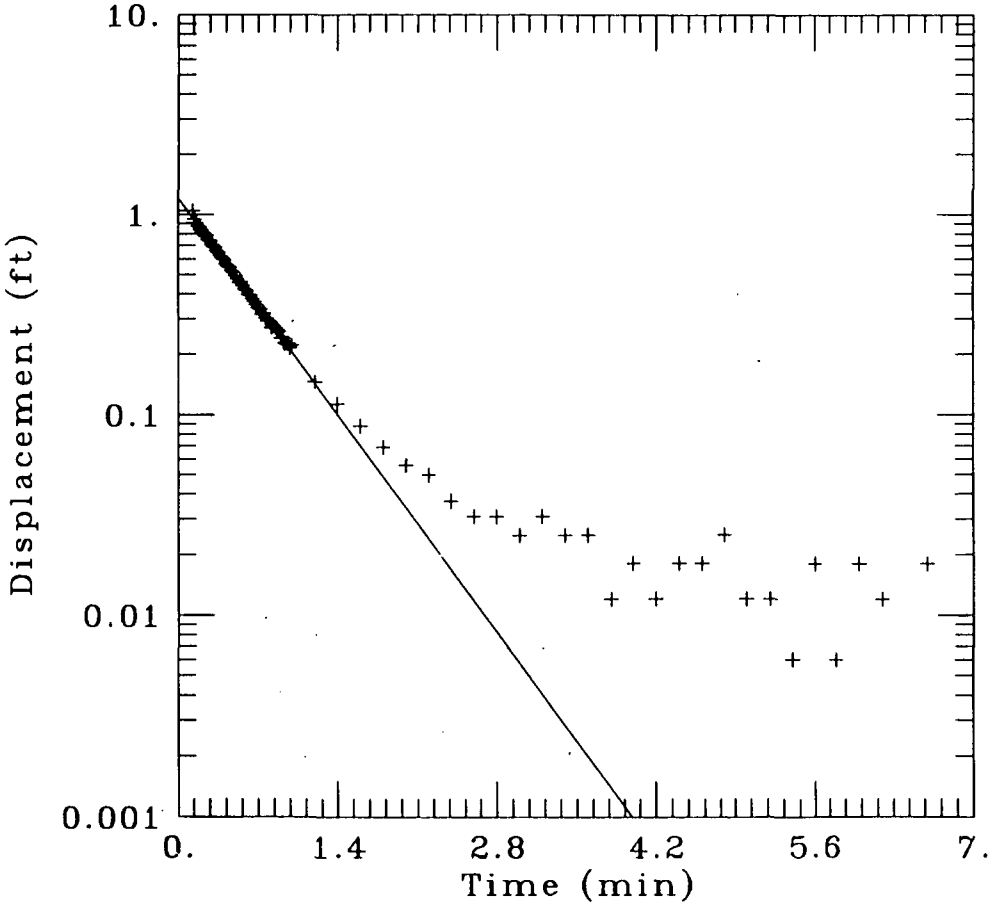
ESTIMATED PARAMETERS:
K = 0 002147 ft/min
y0 = 1 633 ft

TEST DATA:
H0 = 1 291 ft
rc = 0 083 ft
rw = 0 33 ft
L = 10 ft
b = 13 15 ft
H = 13 15 ft

001160.0008

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-003I



DATA SET:
mw-003i.dat
06/21/94

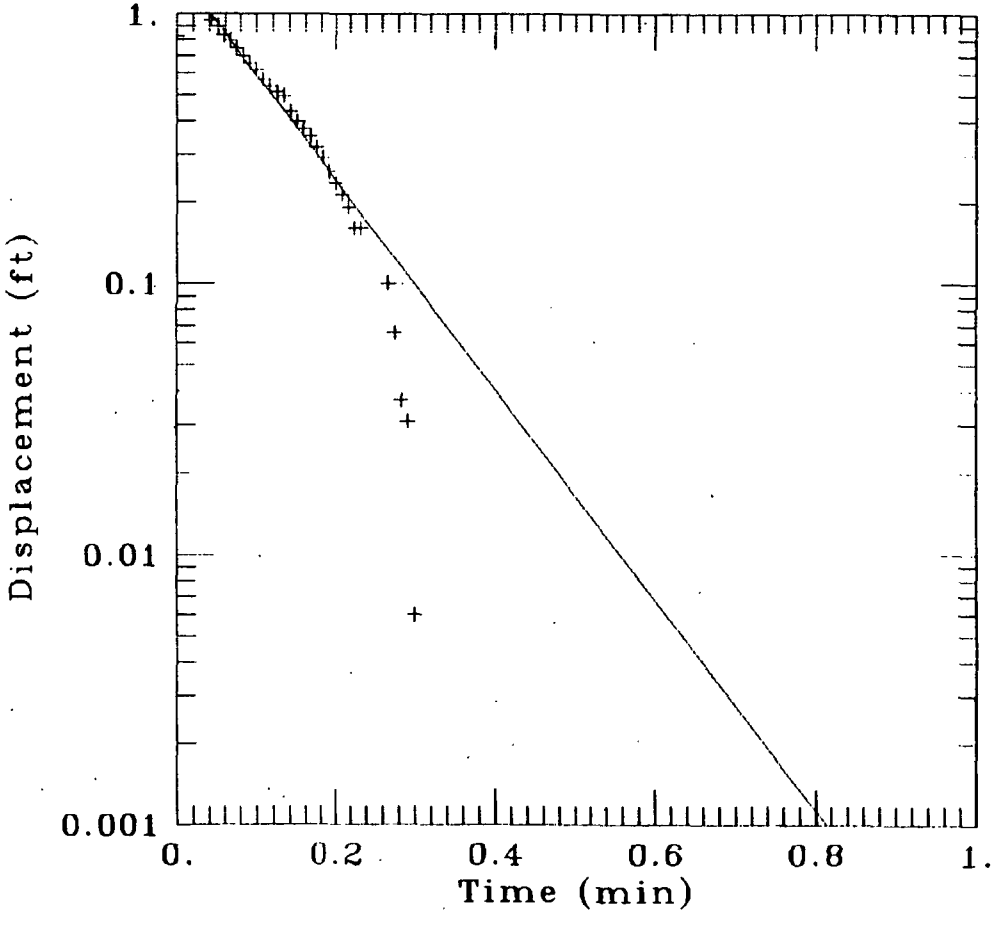
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

ESTIMATED PARAMETERS:
K = 0.001686 ft/min
y0 = 1.208 ft

TEST DATA:
H0 = 1.038 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 13.15 ft
H = 13.15 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-001



DATA SET:
mw-004a.dat
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATE:
26 MAY 94

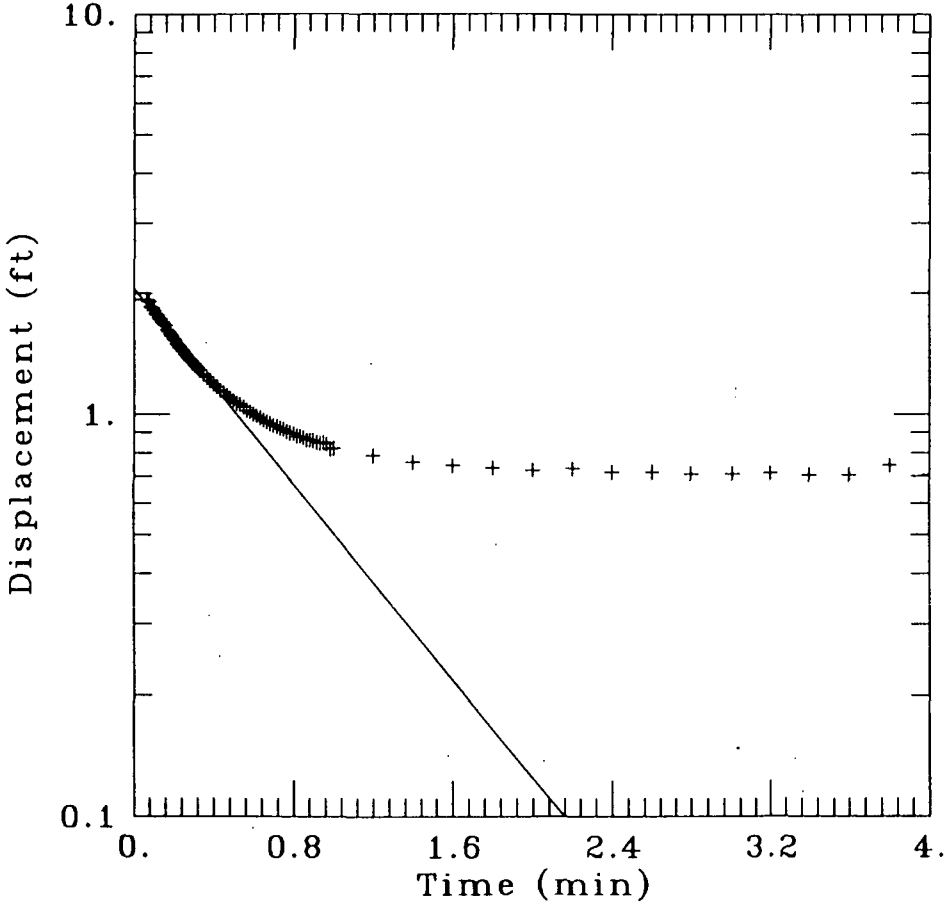
ESTIMATED PARAMETERS:
K = 0.01321 ft/min
y0 = 1.448 ft

TEST DATA:
H0 = 0.822 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 67. ft

001160.0010

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-004I



DATA SET:
mw-004i.dat
06/21/94

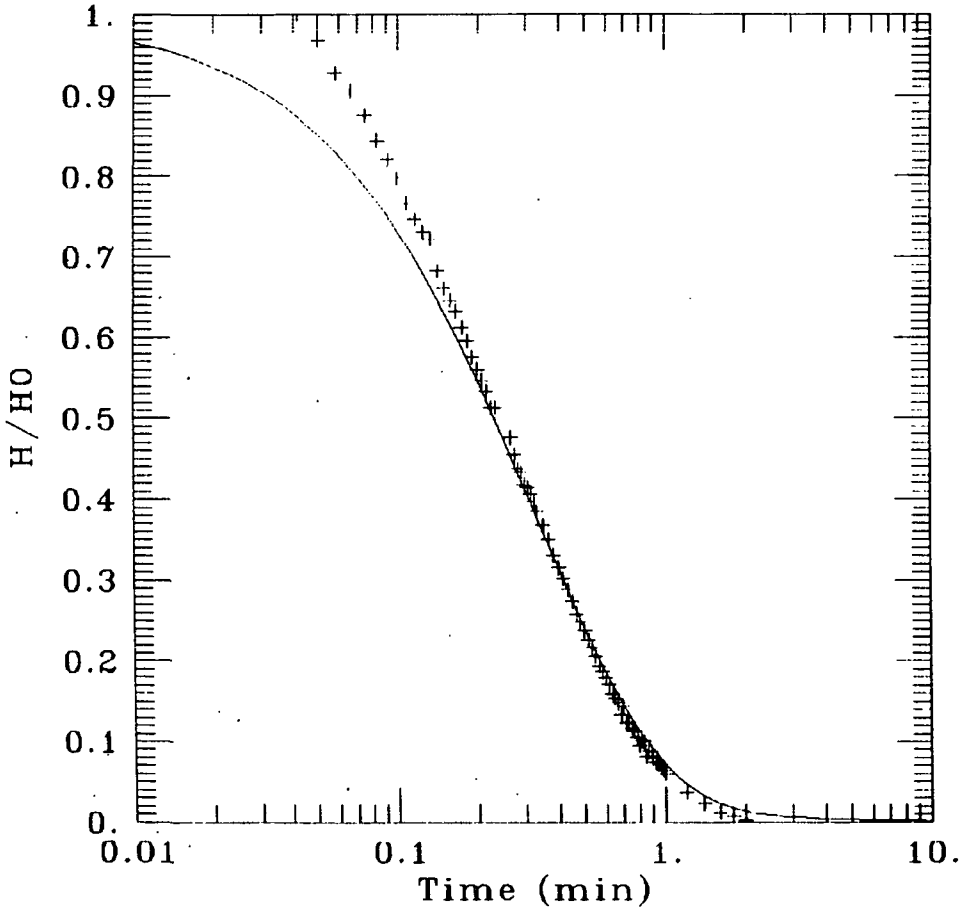
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
26 MAY 94

ESTIMATED PARAMETERS:
K = 0.002071 ft/min
y0 = 2.056 ft

TEST DATA:
H0 = 1.929 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10. ft
b = 10. ft
H = 67. ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-004



DATA SET:
mw-004a2.dat
06/30/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

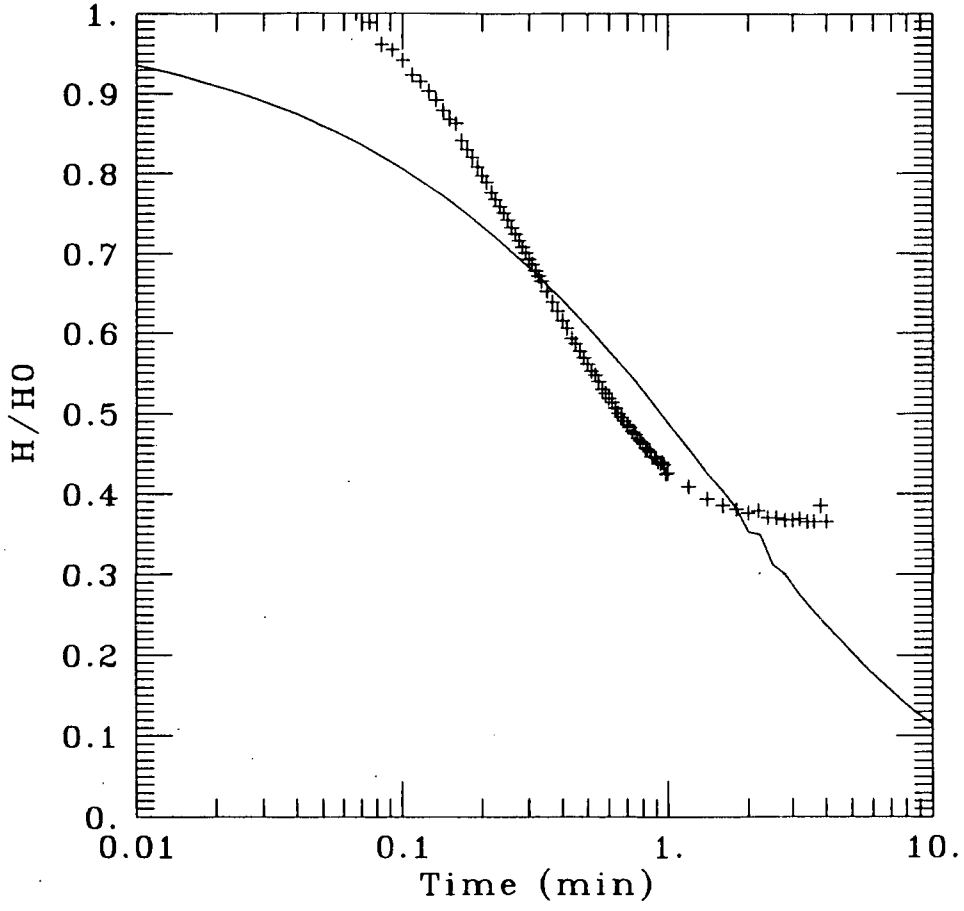
TEST DATE:
26 MAY 94

ESTIMATED PARAMETERS:
T = 0.1333 ft^2/min
S = 8.488E-12

TEST DATA:
H0 = 1.62 ft
rc = 0.083 ft
rw = 0.166 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-004I



DATA SET:
MW-004I.DAT
07/08/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
26 MAY 94

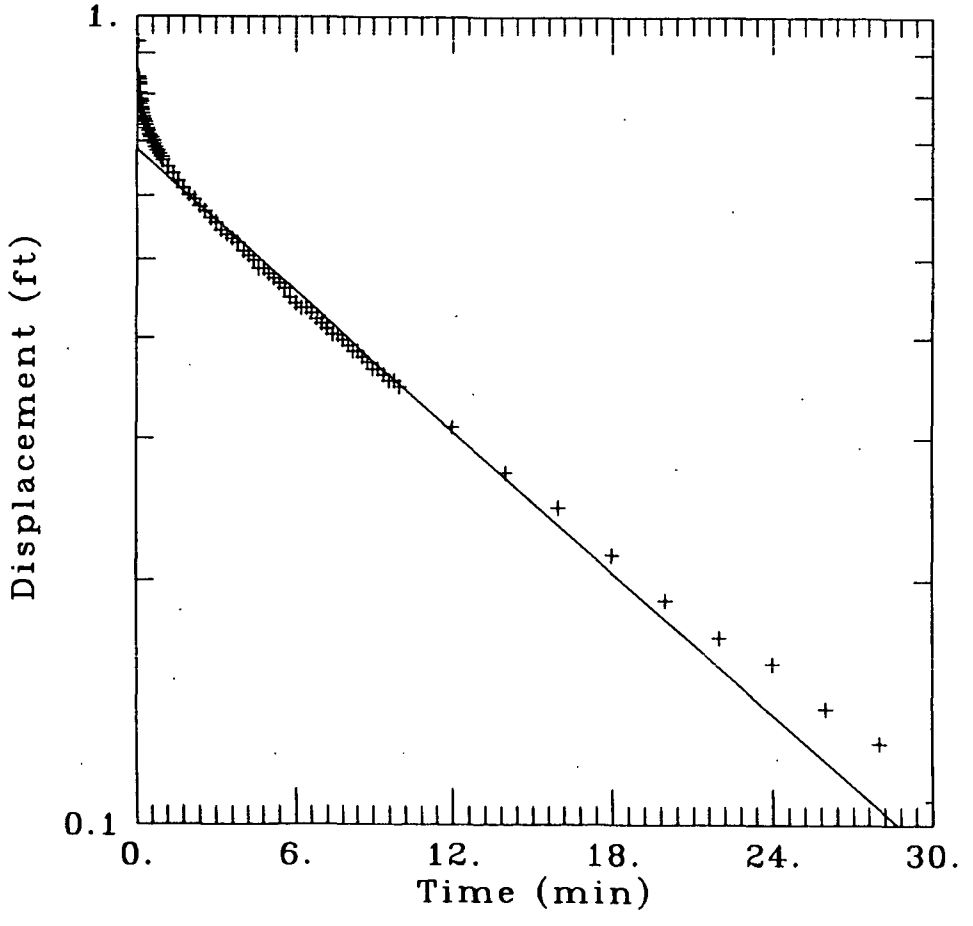
ESTIMATED PARAMETERS:
T = 0.001594 ft^2/min
S = 0.09044

TEST DATA:
H0 = 1.929 ft
rc = 0.083 ft
rw = 0.1666 ft

001160.0013

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-005



DATA SET:
mw-005a.dat
07/29/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

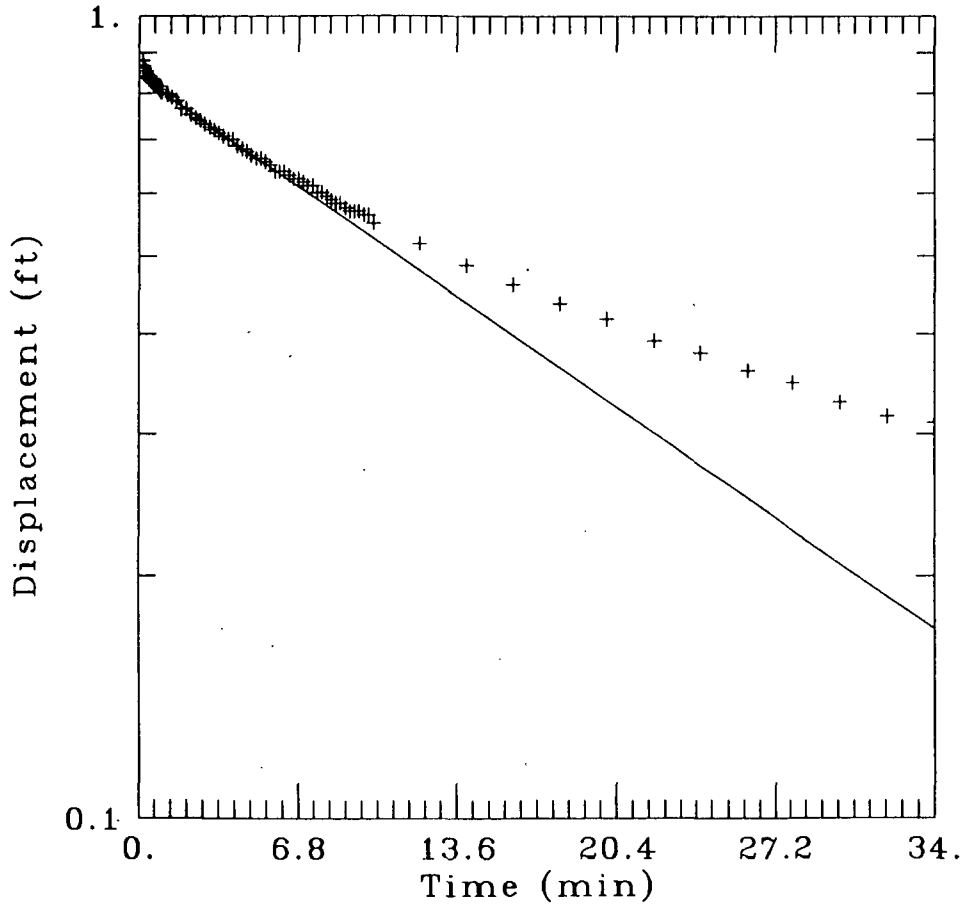
ESTIMATED PARAMETERS:
K = 6.2428E-05 ft/min
y0 = 0.6845 ft

TEST DATA:
H0 = 0.93 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 12.12 ft
H = 12.12 ft

001160.0014

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-005I



DATA SET:
mw-005i.dat
06/21/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

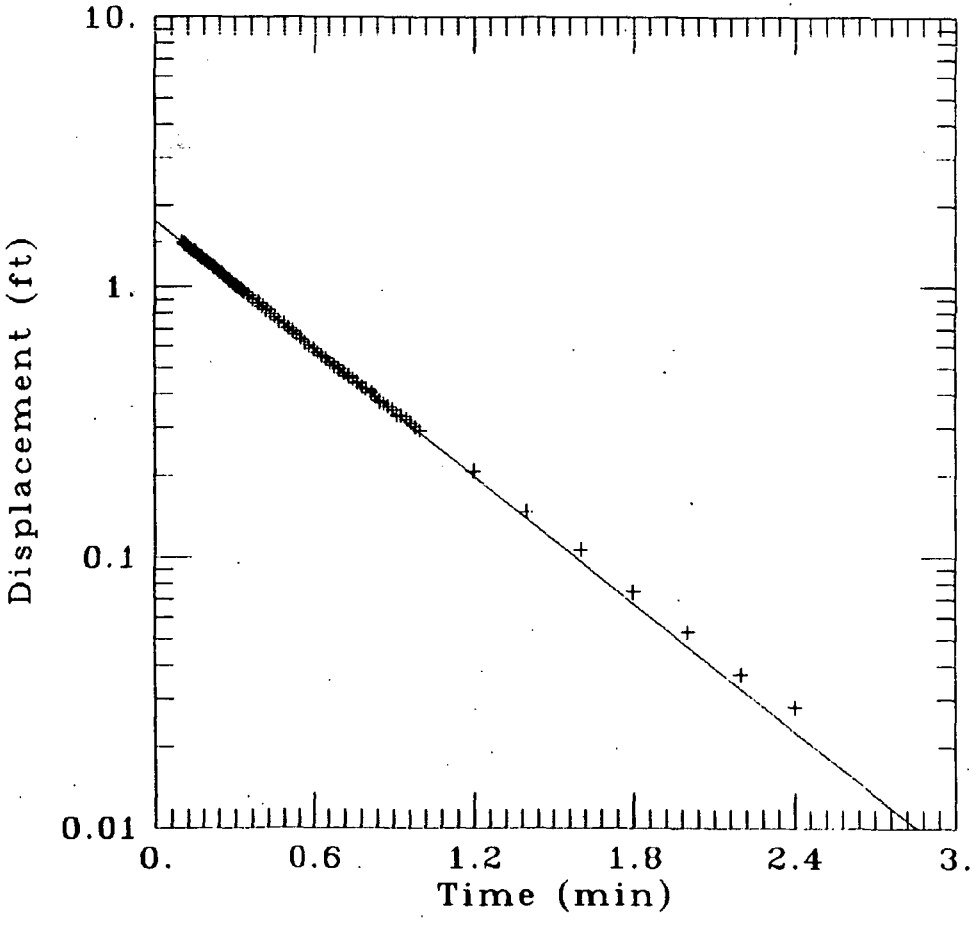
ESTIMATED PARAMETERS:
K = 4.3369E-05 ft/min
y0 = 0.8398 ft

TEST DATA:
H0 = 0.879 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 12.12 ft
H = 12.12 ft

001160.0015

Ecology & Environment, Inc.	Client USEPA
	Location: Agricultural Street Landfill

MW-006



DATA SET:
mw-006a dat
06/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
26 May 94

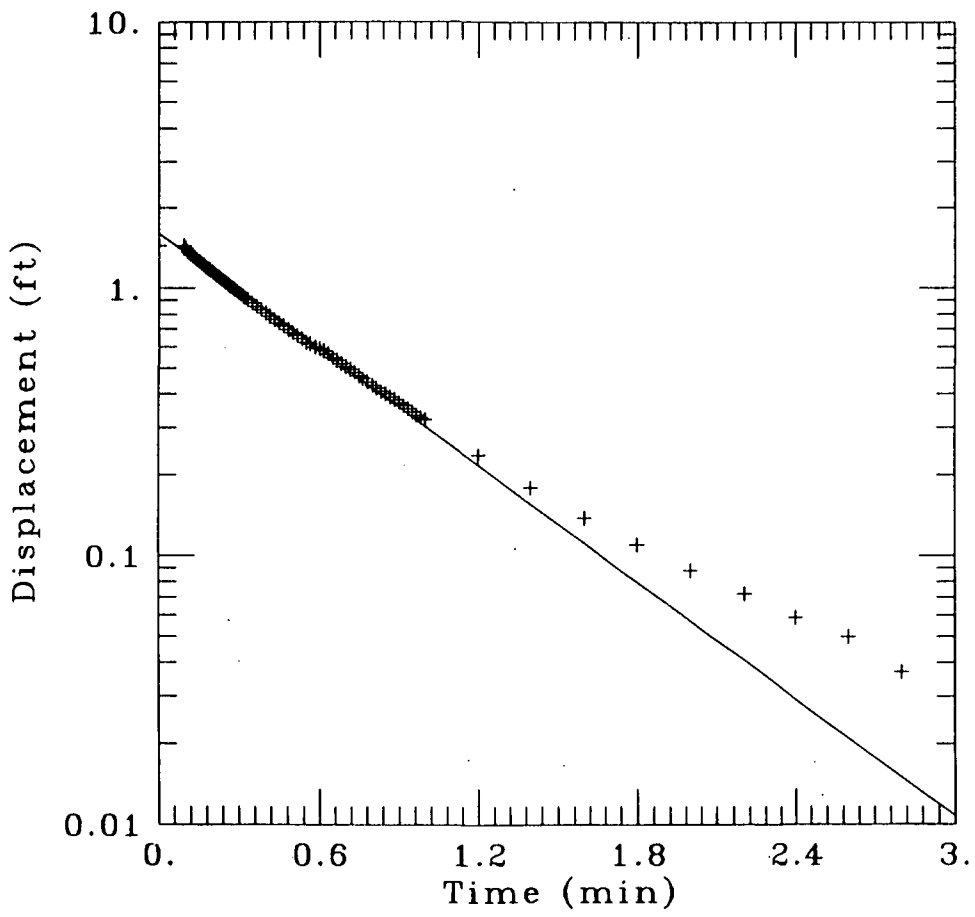
ESTIMATED PARAMETERS:
K = 0.002672 ft/min
y0 = 1.754 ft

TEST DATA:
H0 = 1.466 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 67. ft

001160.0016

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-006I



DATA SET:
mw-006i.dat
06/21/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
26 MAY 94

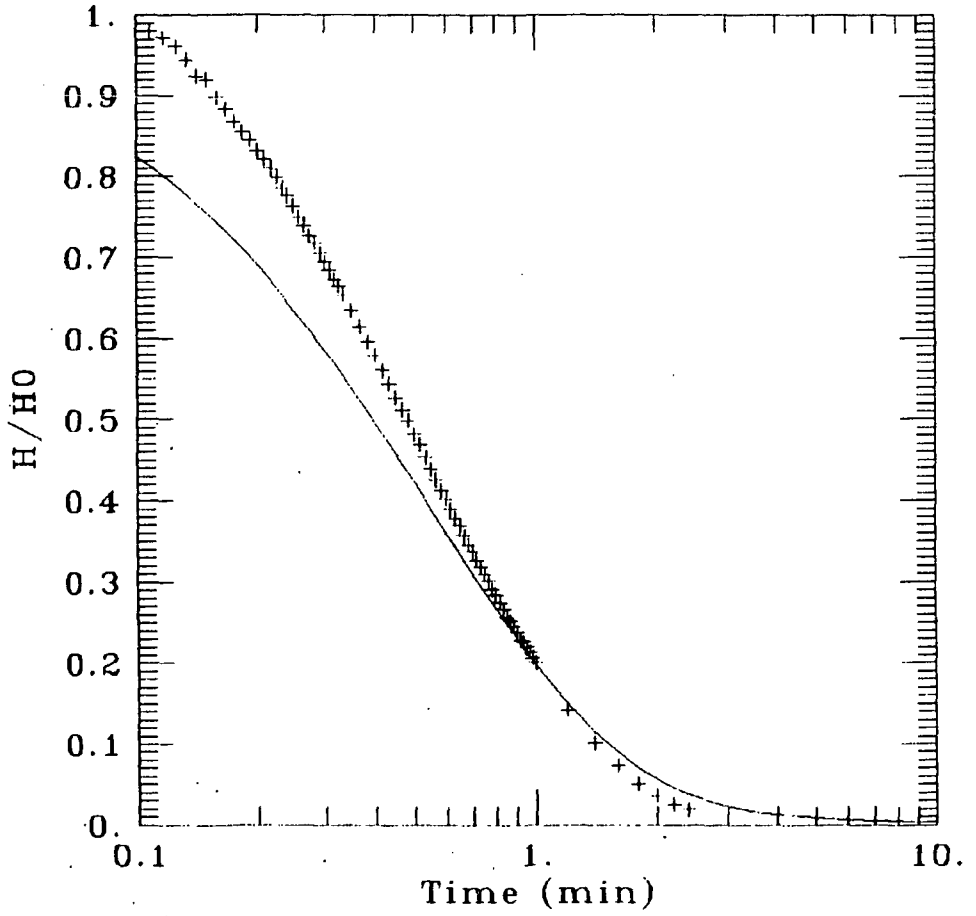
ESTIMATED PARAMETERS:
K = 0.002466 ft/min
y0 = 1.611 ft

TEST DATA:
H0 = 1.444 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10. ft
b = 67. ft
H = 67. ft

001160.0017

Ecology & Environment, Inc.	Client USEPA
	Location: Agricultural Street Landfill

MW-006



DATA SET:
MW 006A DAT
06/29/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
26 May 94

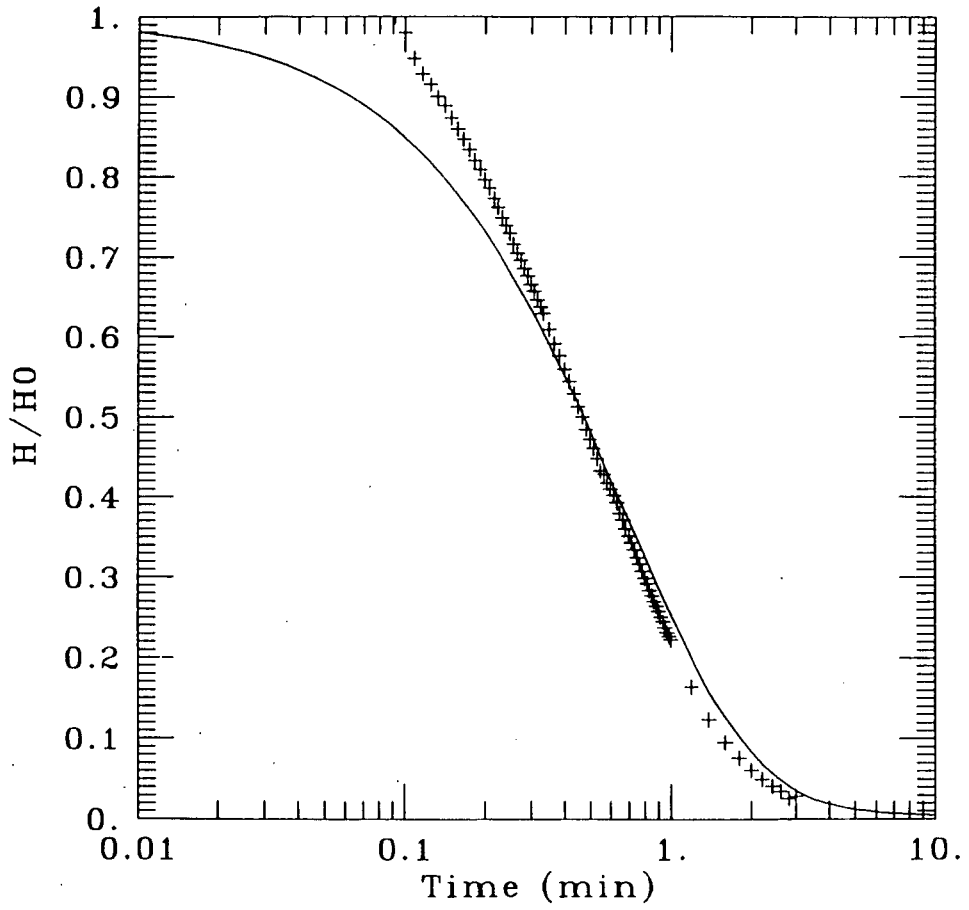
ESTIMATED PARAMETERS:
T = 0.05781 ft^2/min
S = 5.4876E-09

TEST DATA
H0 = 1.466 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0018

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-006I



DATA SET:
MW-006I.DAT
07/08/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
26 MAY 94

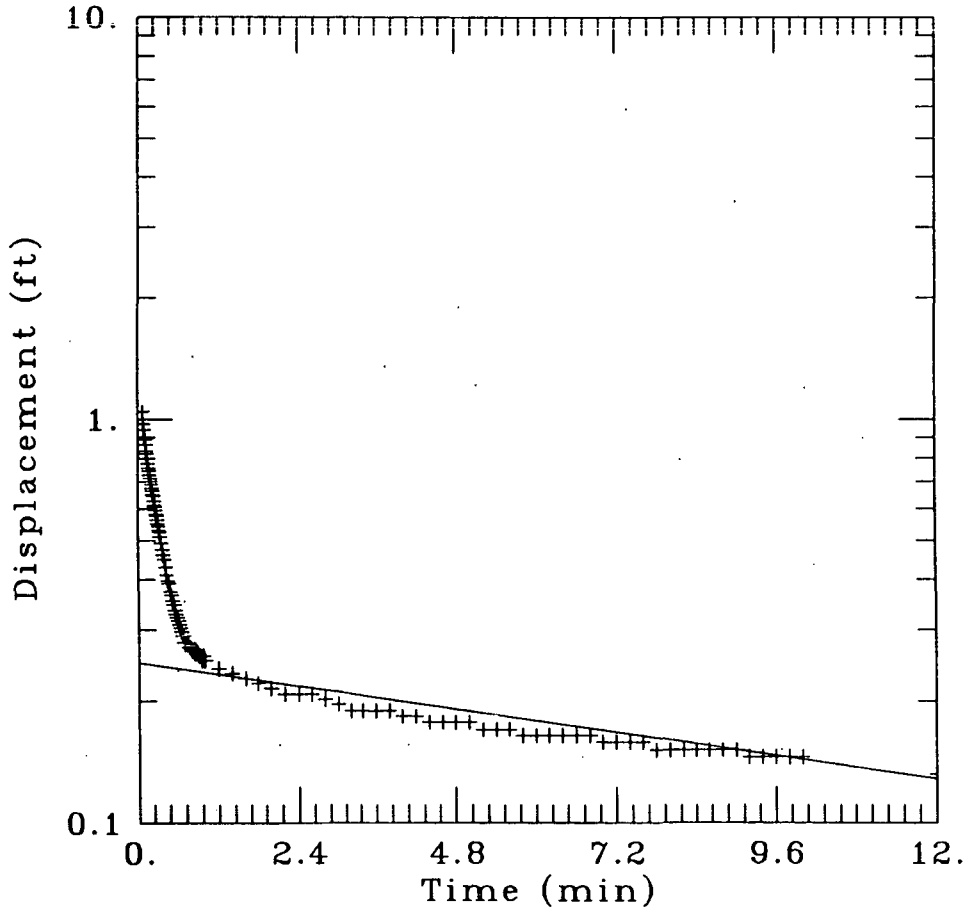
ESTIMATED PARAMETERS:
T = 0.04658 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.444 ft
rc = 0.083 ft
rw = 0.1666 ft

001160.0019

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-007



DATA SET:
mw-007a.dat
07/22/94

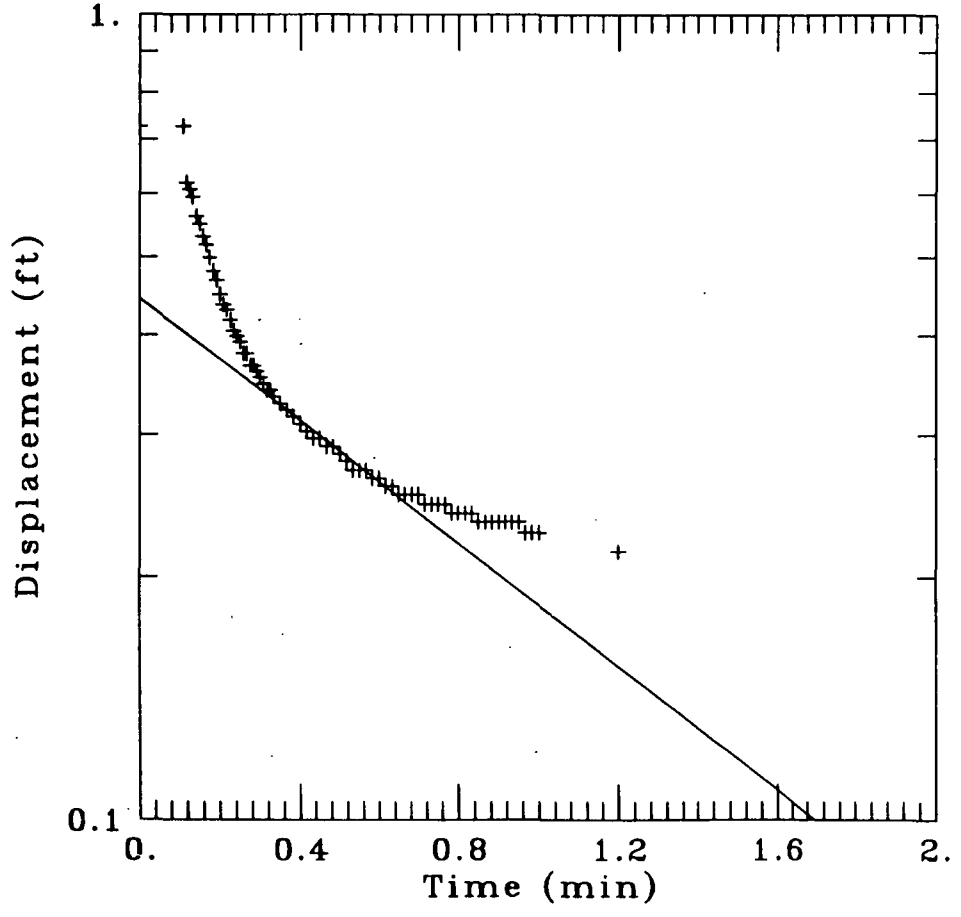
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 May 94

ESTIMATED PARAMETERS:
K = 0.0002611 ft/min
y0 = 0.2488 ft

TEST DATA:
H0 = 1.043 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.3 ft
H = 9.3 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-007I



DATA SET:
mw-007i.dat
07/25/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

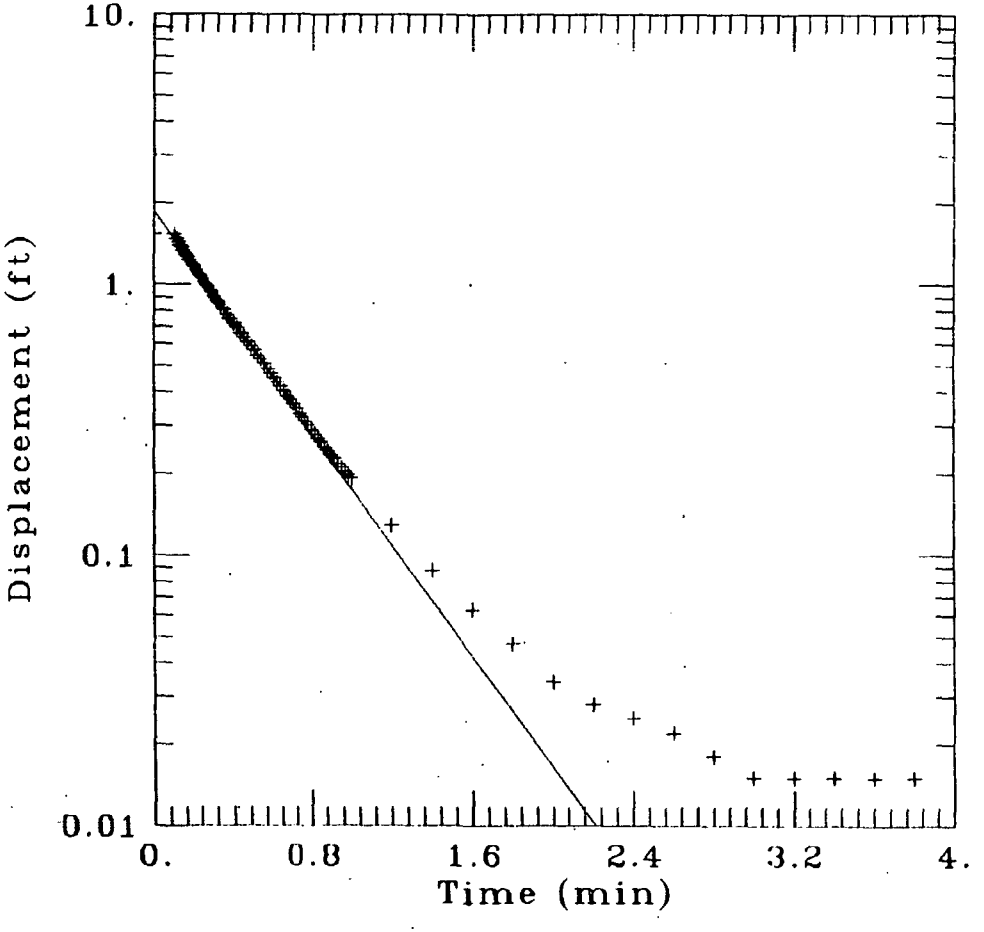
ESTIMATED PARAMETERS:
K = 0.004168 ft/min
y0 = 0.4442 ft

TEST DATA:
H0 = 0.727 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.3 ft
H = 9.3 ft

001160.0021

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-008



DATA SET:
mw-008a dat
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
26 May 94

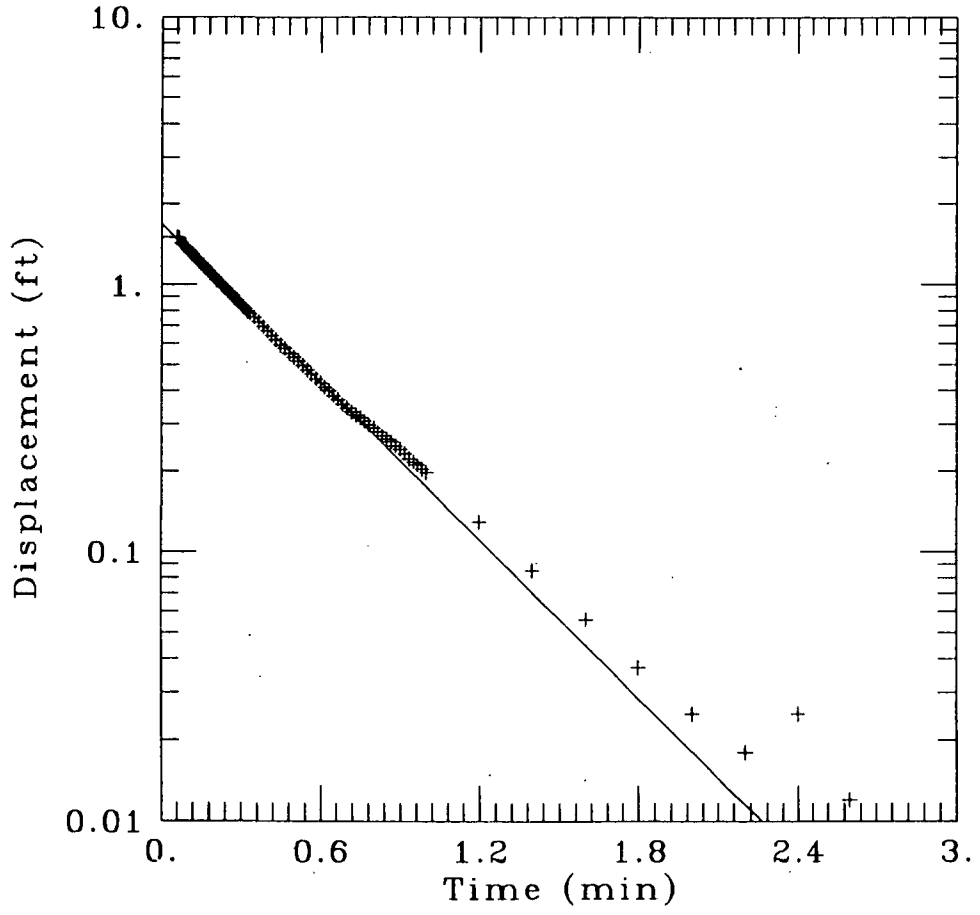
ESTIMATED PARAMETERS:
K = 0.00353 ft/min
y0 = 1.867 ft

TEST DATA:
H0 = 1.529 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 72. ft

001160.0022

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-008I



DATA SET:
mw-008i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
26 MAY 94

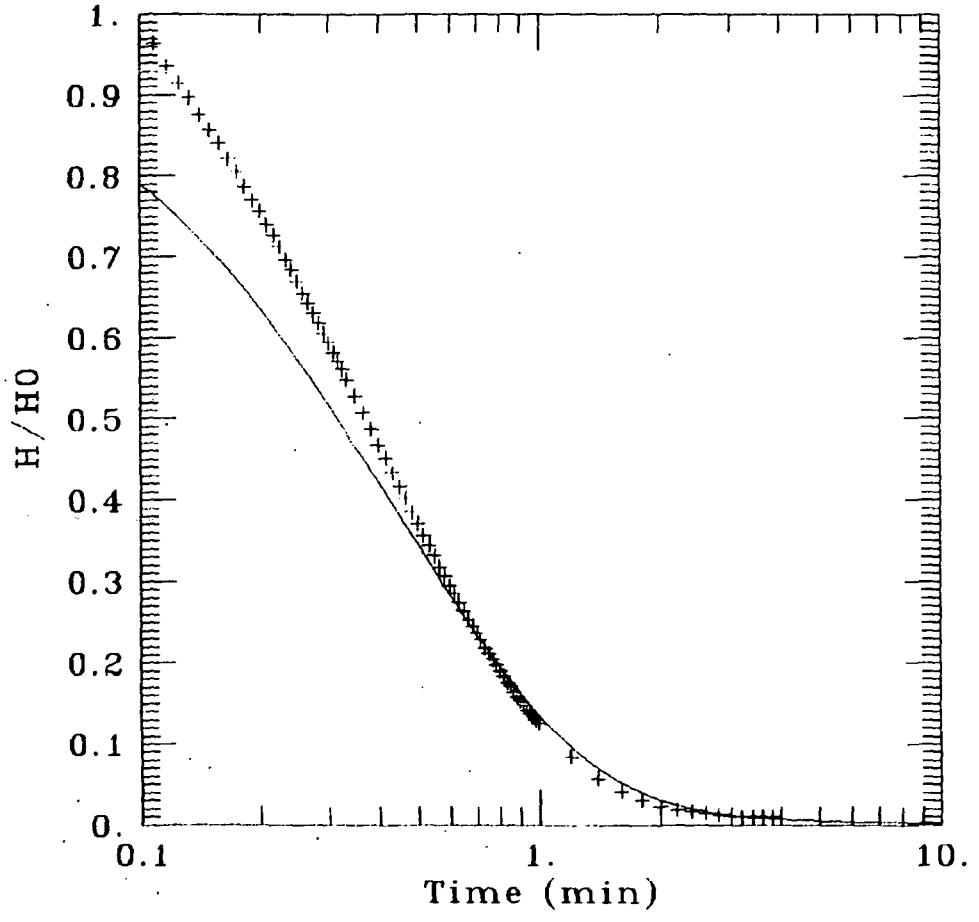
ESTIMATED PARAMETERS:
K = 0.003383 ft/min
y0 = 1.687 ft

TEST DATA:
H0 = 1.504 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10 ft
H = 72. ft

001160.0023

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-008



DATA SET:
MW 008A DAT
06/29/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
26 May 94

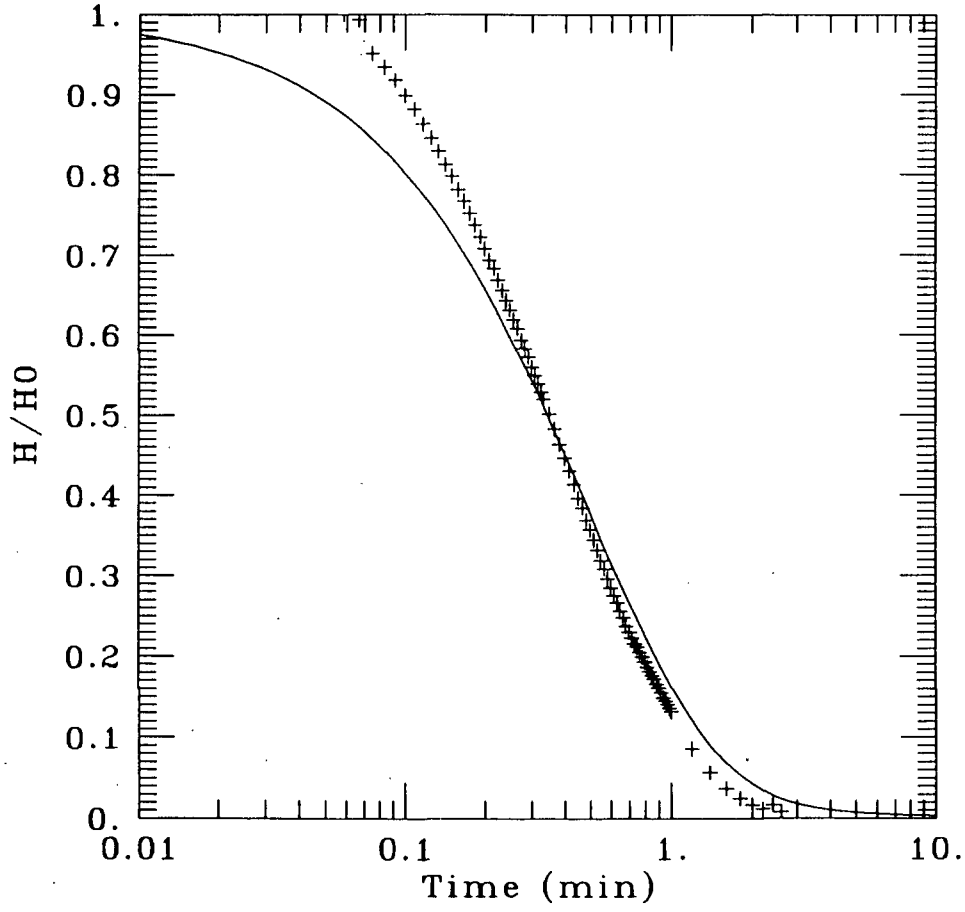
ESTIMATED PARAMETERS:
T = 0 08749 ft^2/min
S = 1 1555E-10

TEST DATA:
H0 = 1 529 ft
rc = 0 083 ft
rw = 0 166 ft

001160.0024

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-008I



DATA SET:
MW-008I.DAT
07/08/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
26 MAY 94

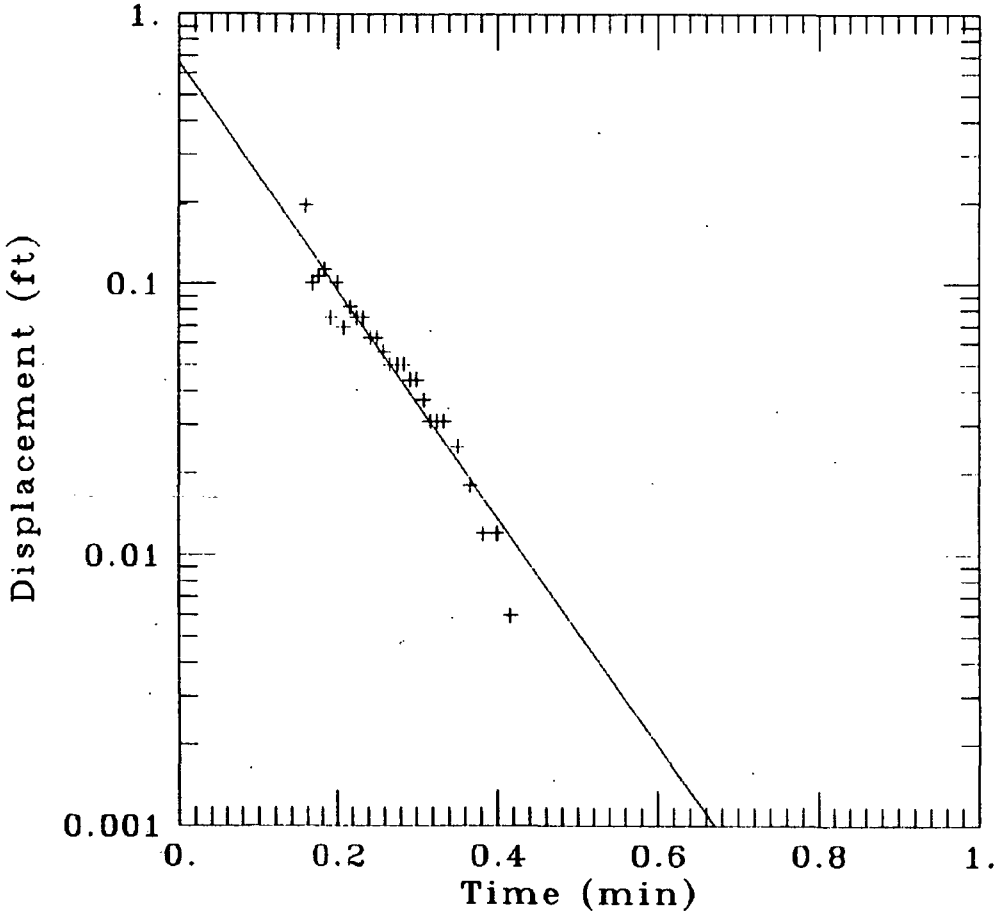
ESTIMATED PARAMETERS:
T = 0.06405 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.504 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0025

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-009



DATA SET:
mw-009a.dat
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
23 May 94

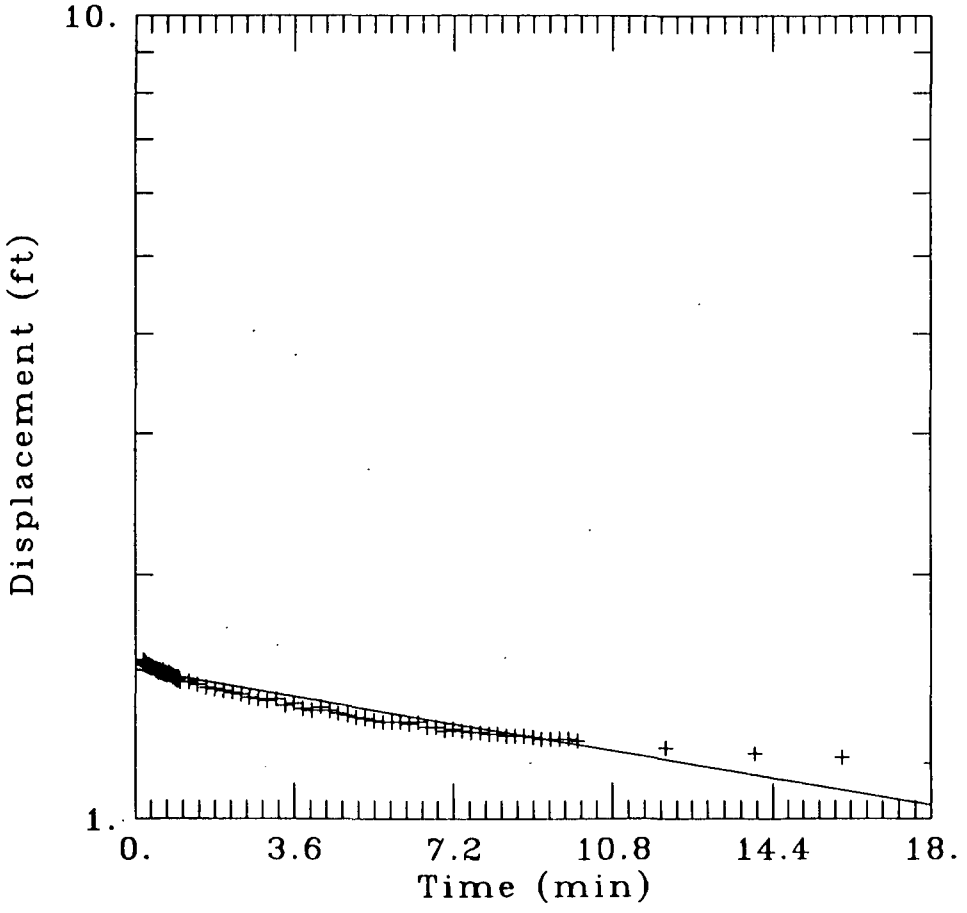
ESTIMATED PARAMETERS:
K = 0.008924 ft/min
y0 = 0.6596 ft

TEST DATA:
H0 = 0.196 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10 ft
b = 11.7 ft
H = 11.7 ft

001160.0026

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-009I



DATA SET:
MW-009I.DAT
06/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

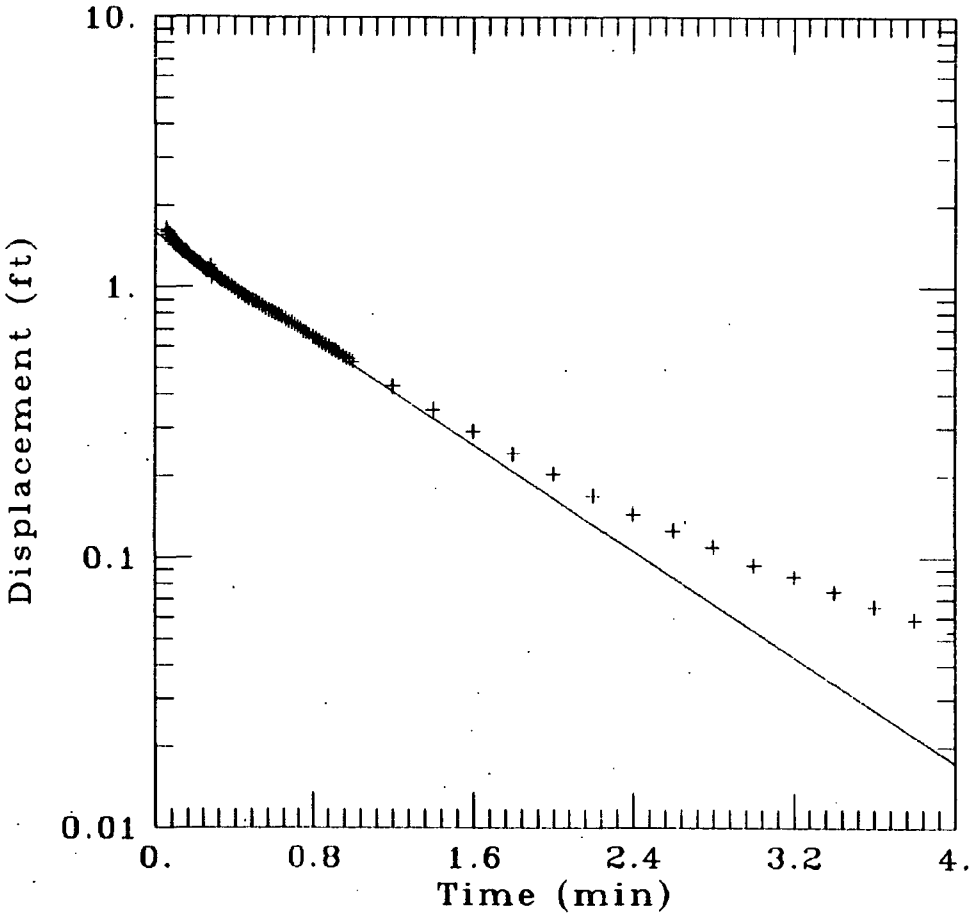
ESTIMATED PARAMETERS:
K = 1.9757E-05 ft/min
y0 = 1.528 ft

TEST DATA:
H0 = 1.569 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.7 ft
H = 11.7 ft

001160.0027

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-010



DATA SET:
mw-010a dat
06/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
26 May 94

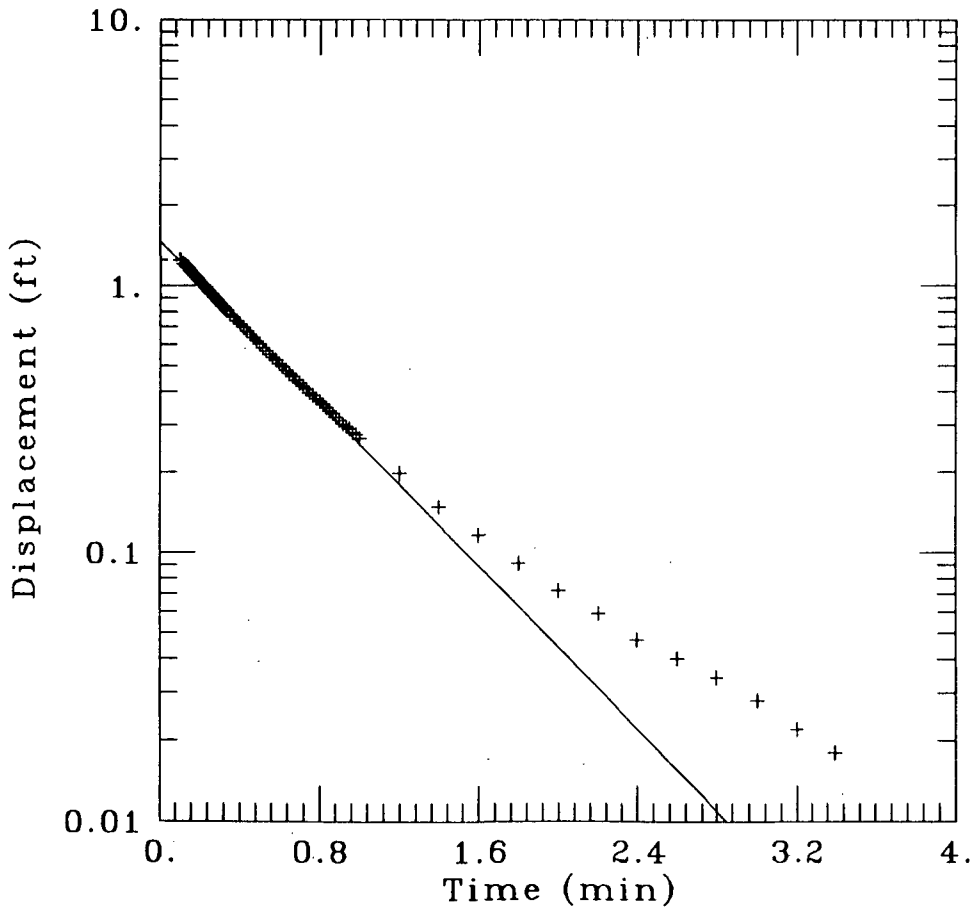
ESTIMATED PARAMETERS:
K = 0.00167 ft/min
y0 = 1.588 ft

TEST DATA:
H0 = 1 639 ft
rc = 0.083 ft
rw = 0 166 ft
L = 10 ft
b = 10. ft
H = 67. ft

001160.0028

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-010I



DATA SET:
mw-010i.dat
06/21/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
26 MAY 94

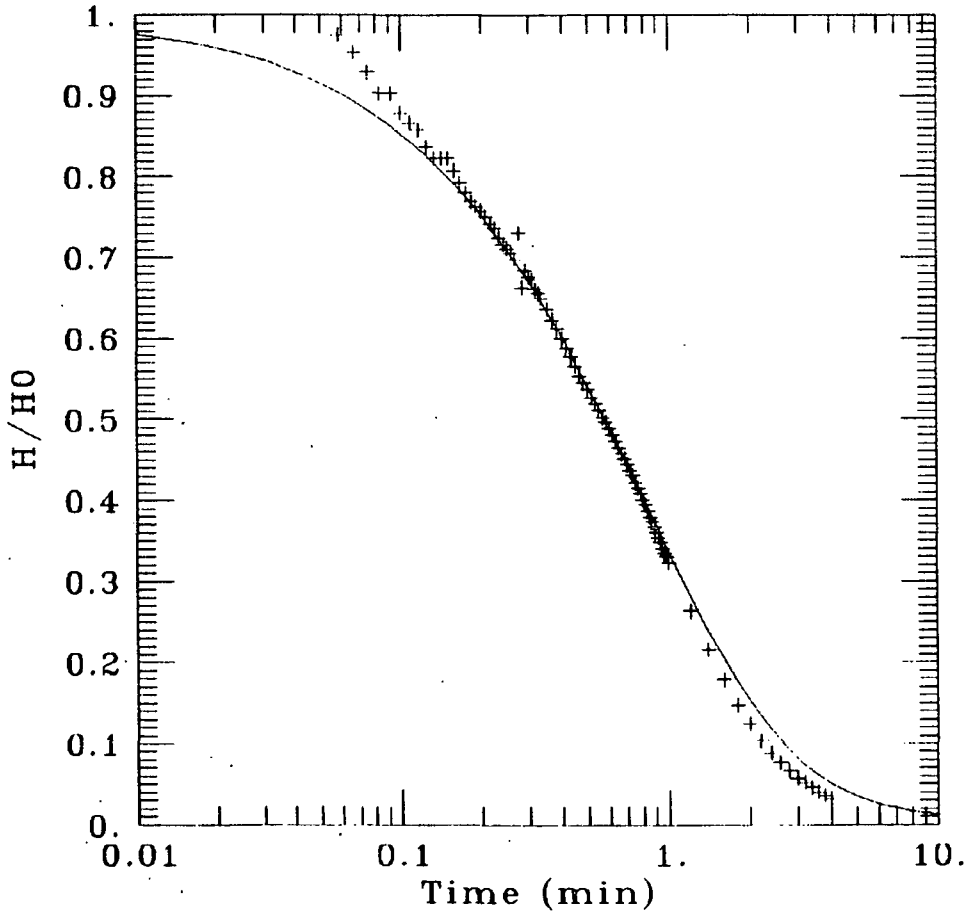
ESTIMATED PARAMETERS:
K = 0.002589 ft/min
y0 = 1.471 ft

TEST DATA:
H0 = 1.248 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 67. ft

001160.0029

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-010



DATA SET:
MW-010A DAT
06/29/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
26 May 94

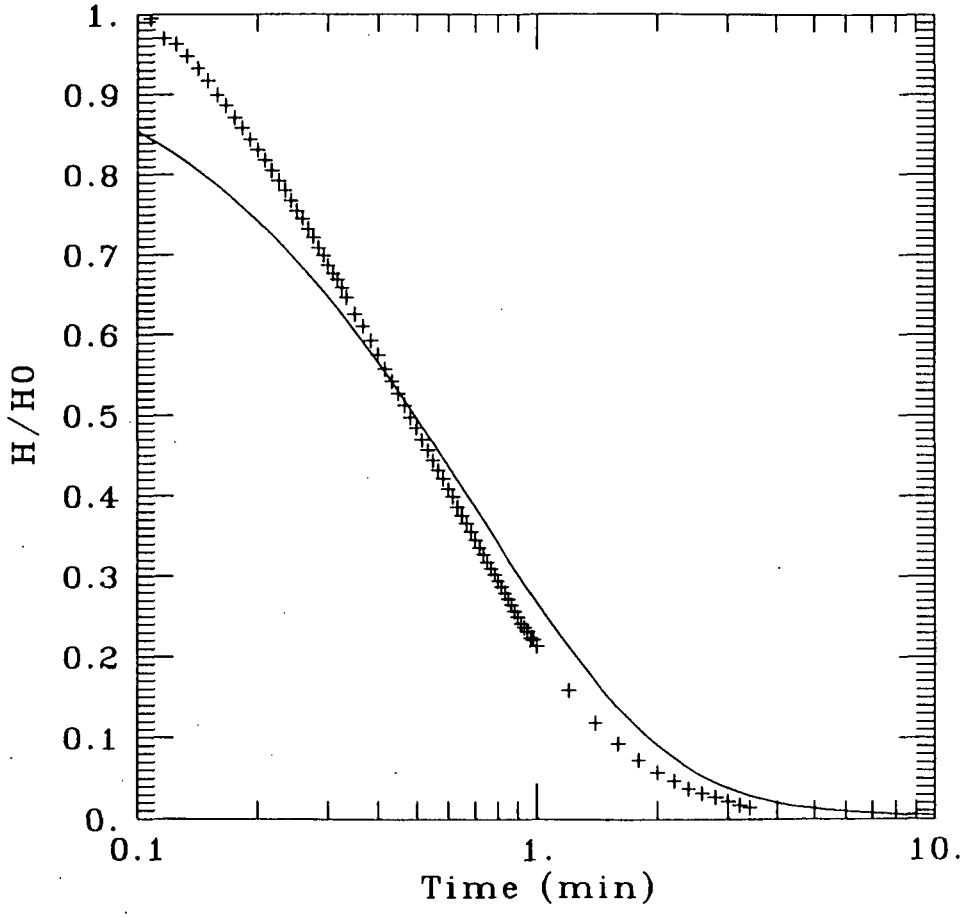
ESTIMATED PARAMETERS:
T = 0.01768 ft^2/min
S = 0.0001011

TEST DATA:
H0 = 1.639 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0030

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-010I



DATA SET:
MW-010I.DAT
07/08/94

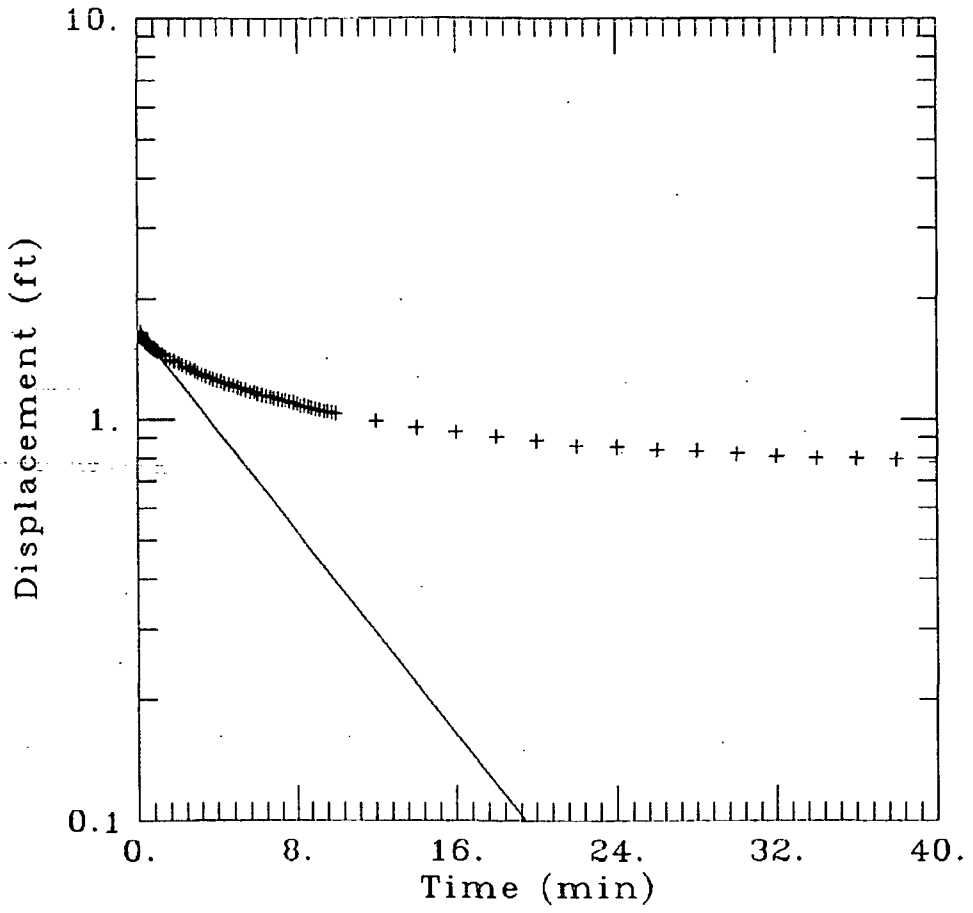
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
26 MAY 94

ESTIMATED PARAMETERS:
T = 0.04449 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.248 ft
rc = 0.083 ft
rw = 0.166 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-011



DATA SET:
mw-011a.dat
06/10/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
23 MAY 94

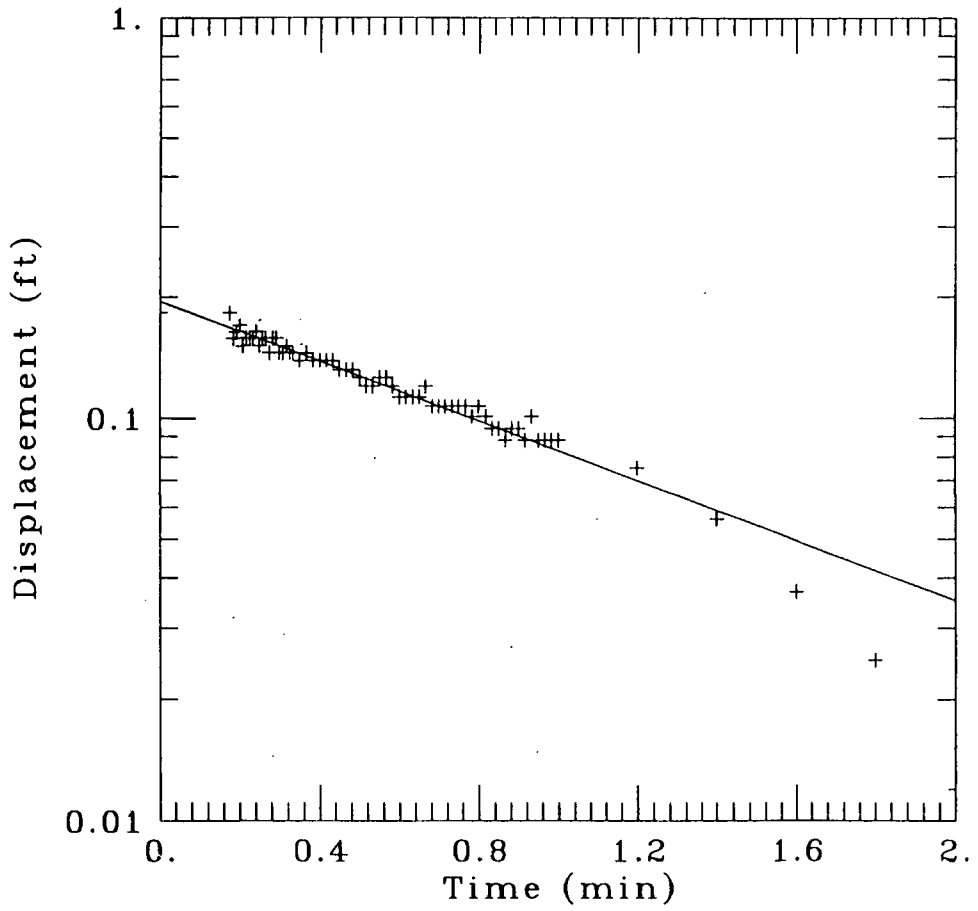
ESTIMATED PARAMETERS:
K = 0.0001344 ft/min
y0 = 1.672 ft

TEST DATA:
H0 = 1.632 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10 ft
b = 10. ft
H = 12.05 ft

001160.0032

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-011I



DATA SET:
mw-011i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
23 MAY 94

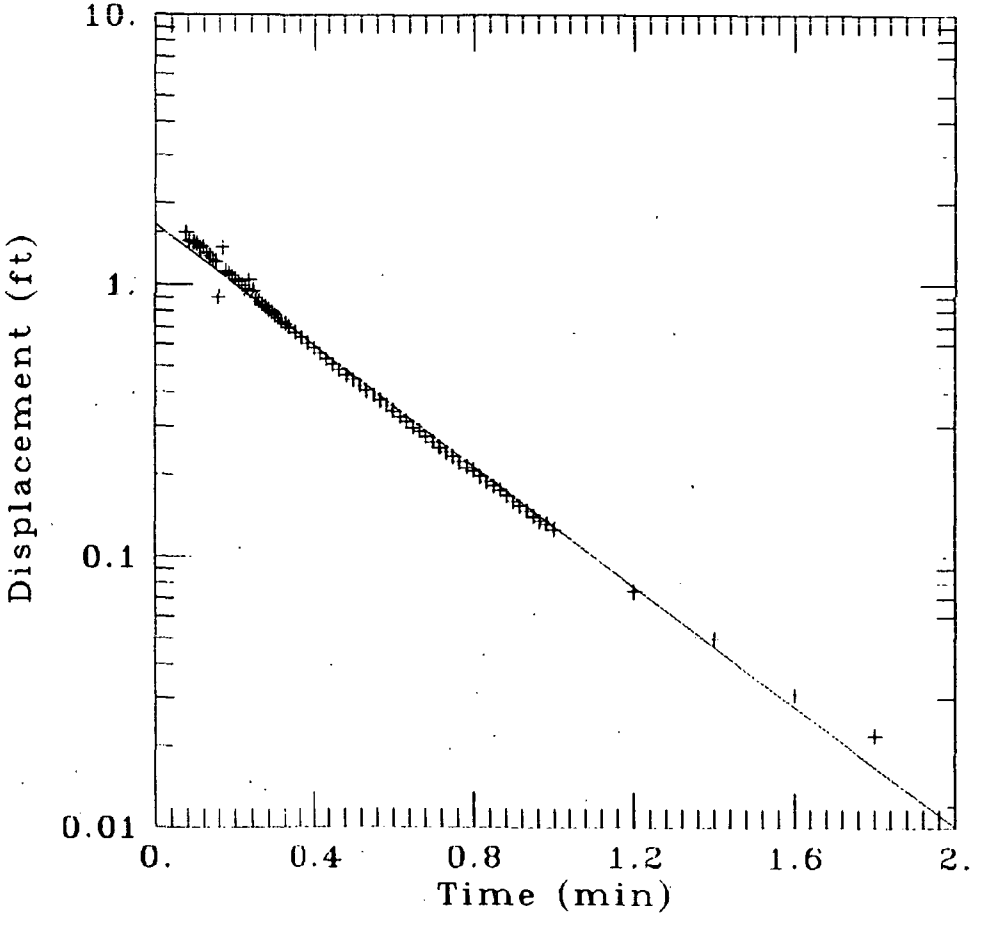
ESTIMATED PARAMETERS:
K = 0.0007956 ft/min
y0 = 0.1954 ft

TEST DATA:
H0 = 0.183 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 12.05 ft
H = 12.05 ft

001160.0033

Ecology & Environment, Inc.	Client: USEPA Location: Agricultural Street Landfill

MW-012



DATA SET:
MW 012A DAT
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATE
26 May 94

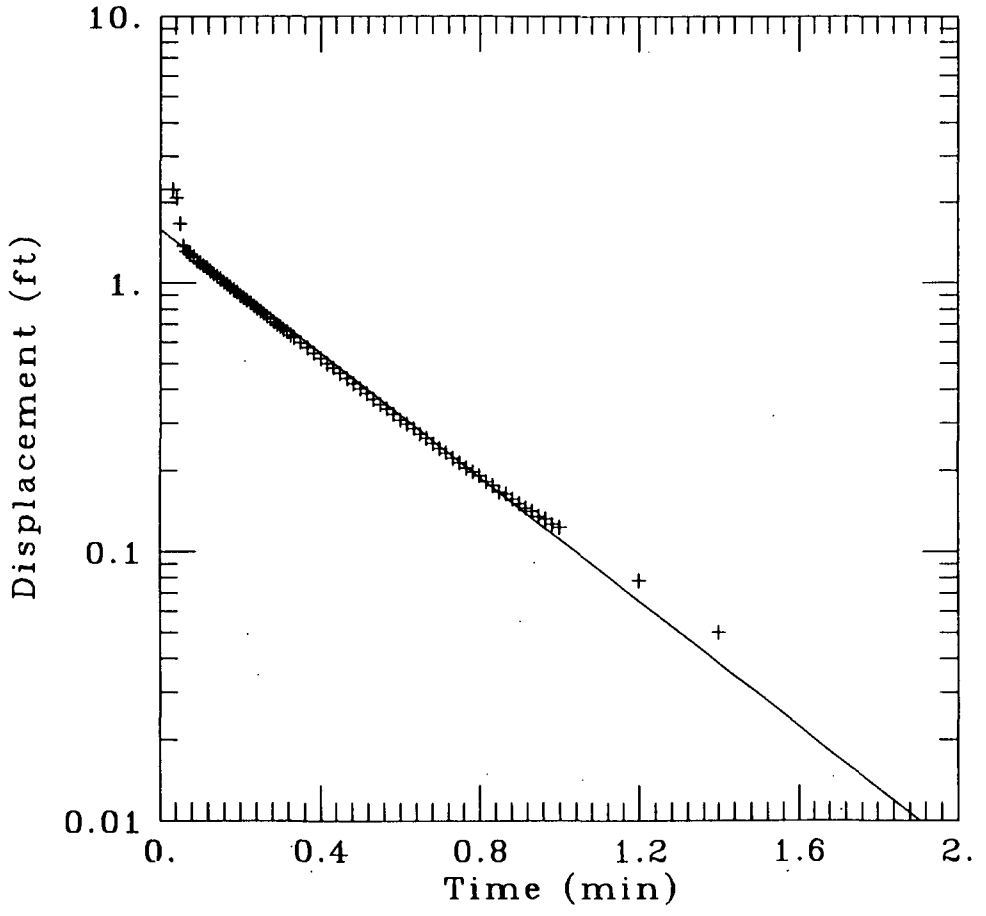
ESTIMATED PARAMETERS:
K = 0.007022 ft/min
y0 = 1.671 ft

TEST DATA
H0 = 1.554 ft
rc = 0.083 ft
rw = 0.166 ft
L = 5 ft
b = 5 ft
H = 63. ft

001160.0034

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-012I



DATA SET:
mw-012i.dat
07/12/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
23 MAY 94

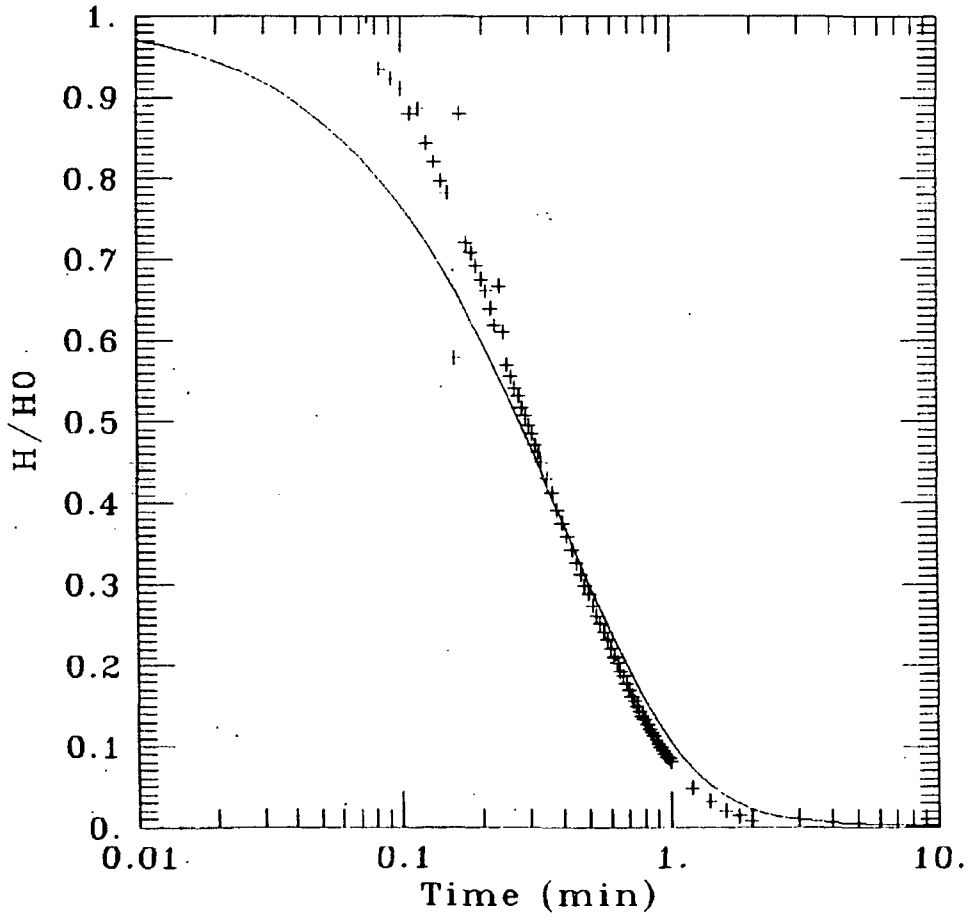
ESTIMATED PARAMETERS:
K = 0.007305 ft/min
y0 = 1.585 ft

TEST DATA:
H0 = 2.239 ft
rc = 0.083 ft
rw = 0.166 ft
L = 5. ft
b = 5. ft
H = 63. ft

001160.0035

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-012



DATA SET:
MW-012A.DAT
06/29/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
26 May 94

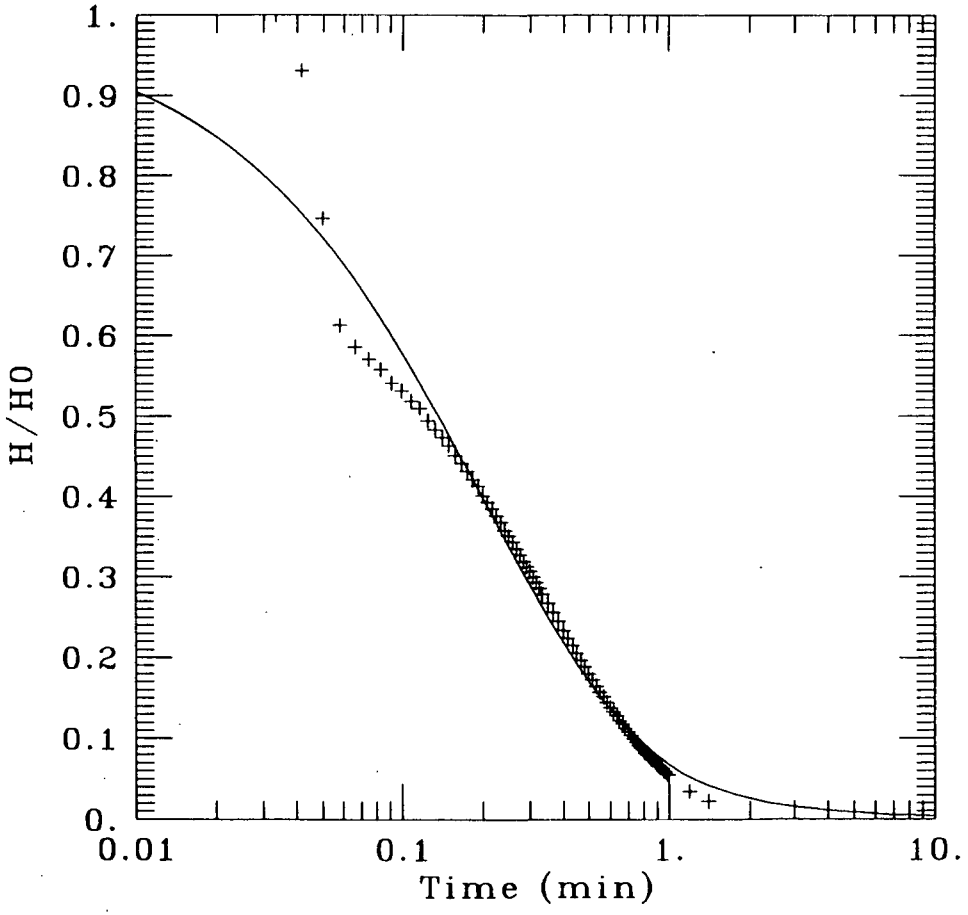
ESTIMATED PARAMETERS:
T = 0.09837 ft^2/min
S = 1.6481E-10

TEST DATA:
H0 = 1.554 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0036

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-012I



DATA SET:
mw-012i.dat
07/12/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al
TEST DATE:
23 MAY 94

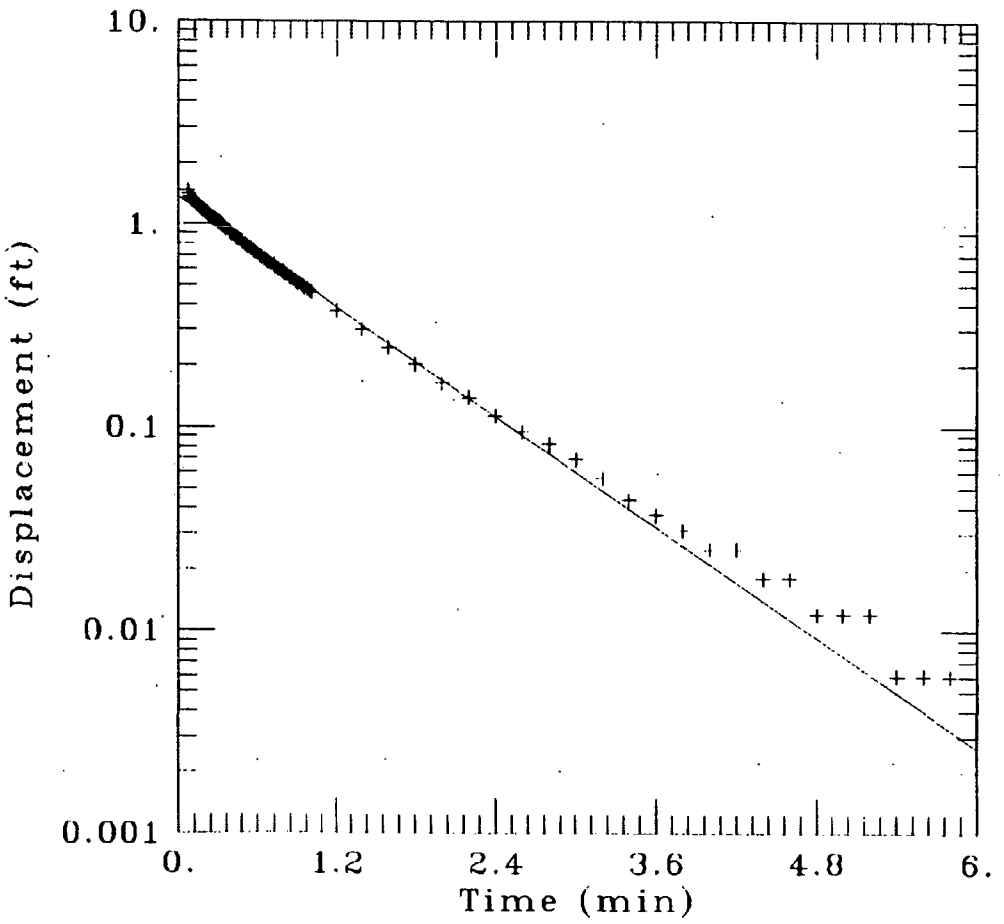
ESTIMATED PARAMETERS:
T = 0.0465 ft^2/min
S = 0.001787

TEST DATA:
H0 = 2.239 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0037

Ecology & Environment, Inc.	Client: USEPA Location: Agricultural Street Landfill

MW-013



DATA SET:
MW-013A.DAT
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE
23 May 94

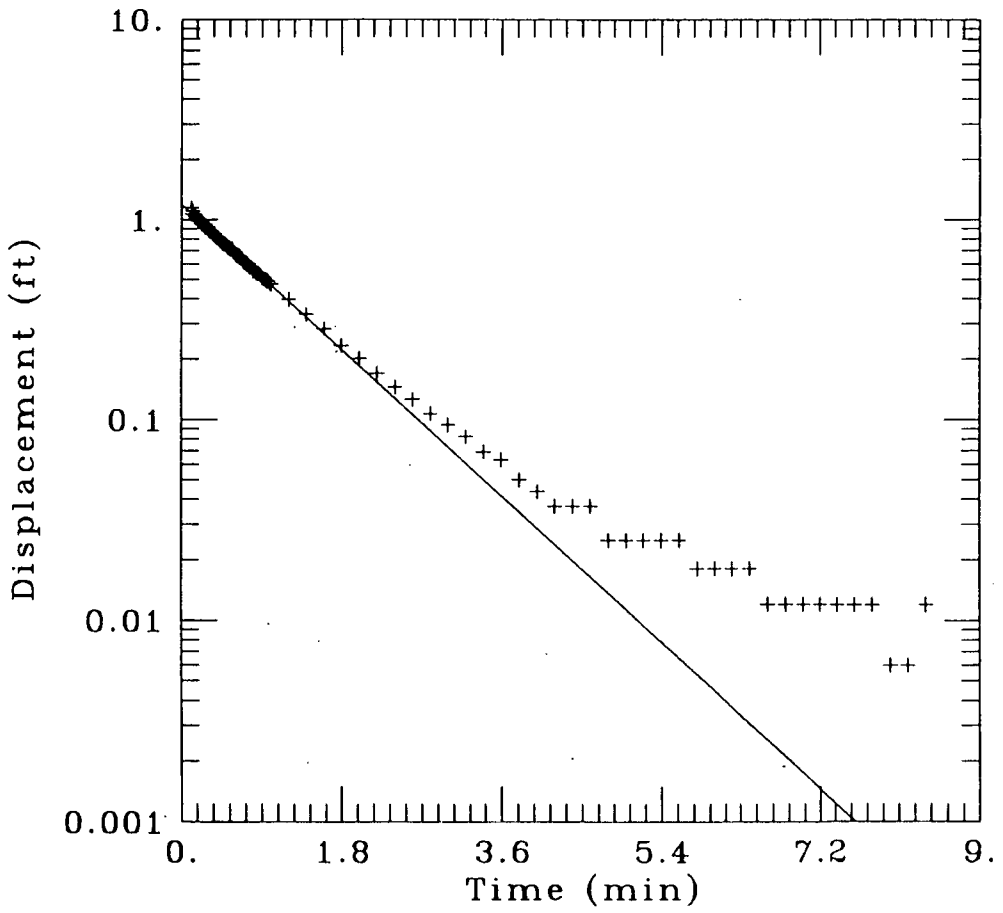
ESTIMATED PARAMETERS:
K = 0.0009649 ft/min
y0 = 1.353 ft

TEST DATA
H0 = 1.461 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 12. ft
H = 12. ft

001160.0038

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-013I



DATA SET:
MW-013I.DAT
07/12/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
23 MAY 94

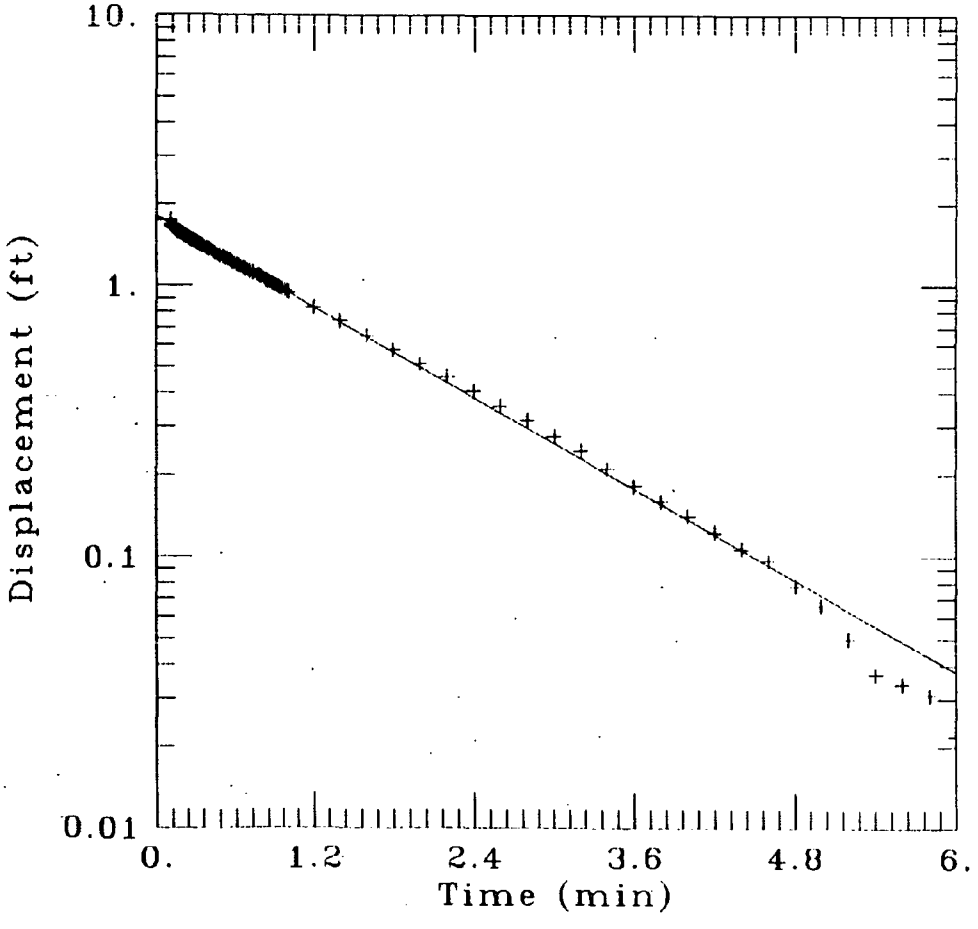
ESTIMATED PARAMETERS:
K = 0.0008607 ft/min
y0 = 1.191 ft

TEST DATA:
H0 = 1.145 ft
rc = 0.083 ft
rw = 0.333 ft
L = 10. ft
b = 12. ft
H = 12. ft

001160.0039

Ecology & Environment, Inc.	Client USEPA
	Location: Agricultural Street Landfill

MW-014



DATA SET:
MW-014A.DAT
06/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE
23 May 94

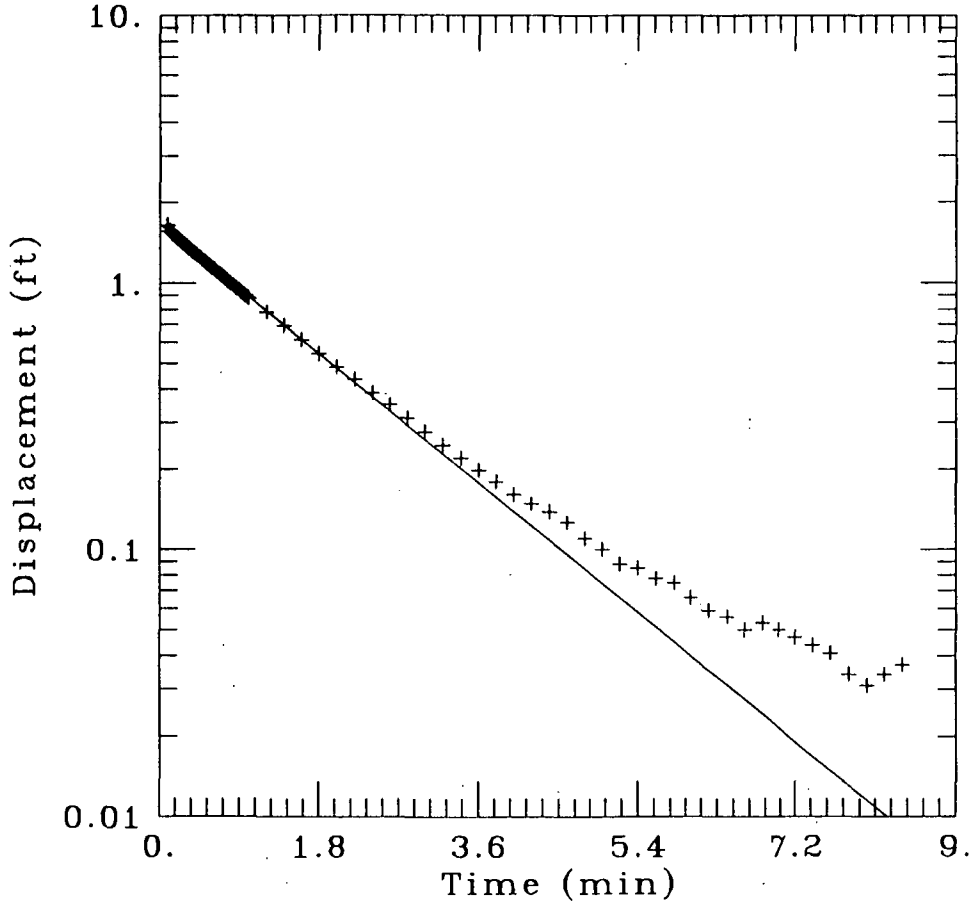
ESTIMATED PARAMETERS:
K = 0.001775 ft/min
y0 = 1.817 ft

TEST DATA
H0 = 1.747 ft
rc = 0.083 ft
rw = 0.166 ft
L = 5 ft
b = 5 ft
H = 64 ft

001160.0040

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-014I



DATA SET:
mw-014i.dat
06/21/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

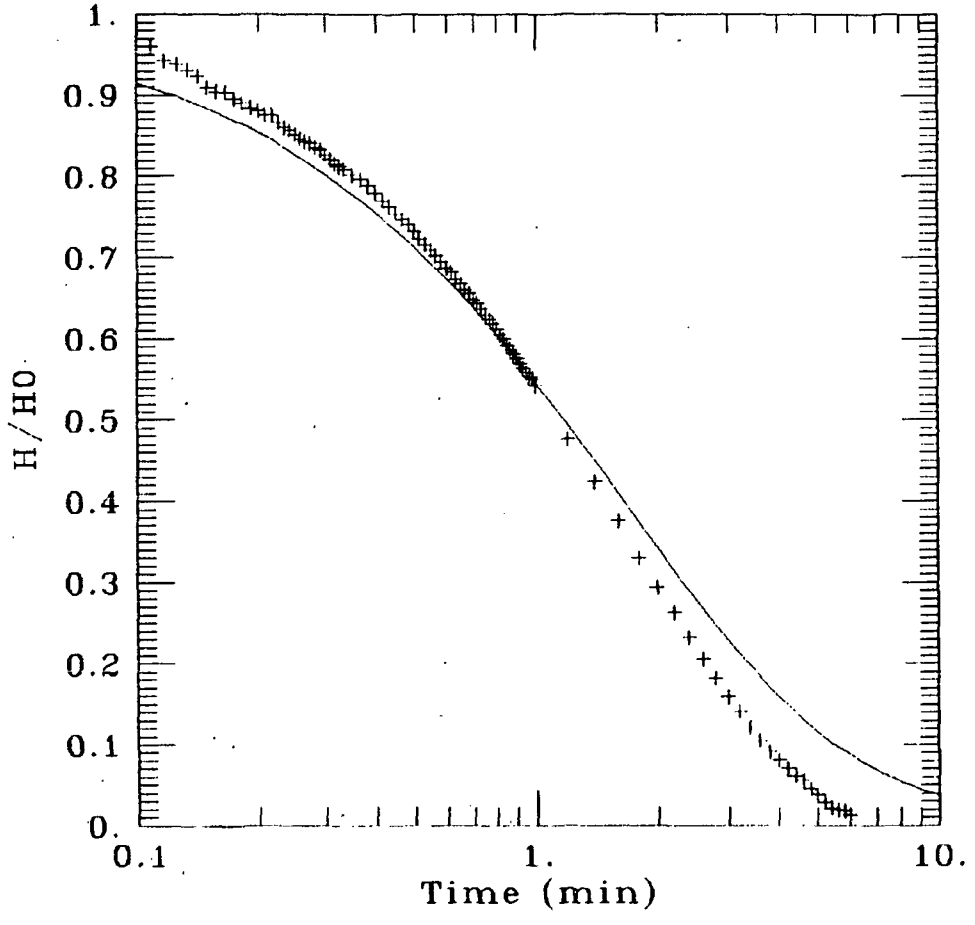
ESTIMATED PARAMETERS:
K = 0.001709 ft/min
y0 = 1.66 ft

TEST DATA:
H0 = 1.649 ft
rc = 0.083 ft
rw = 0.166 ft
L = 5. ft
b = 5. ft
H = 64. ft

001160.0041

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-014



DATA SET:
MW-014A DAT
06/29/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
23 May 94

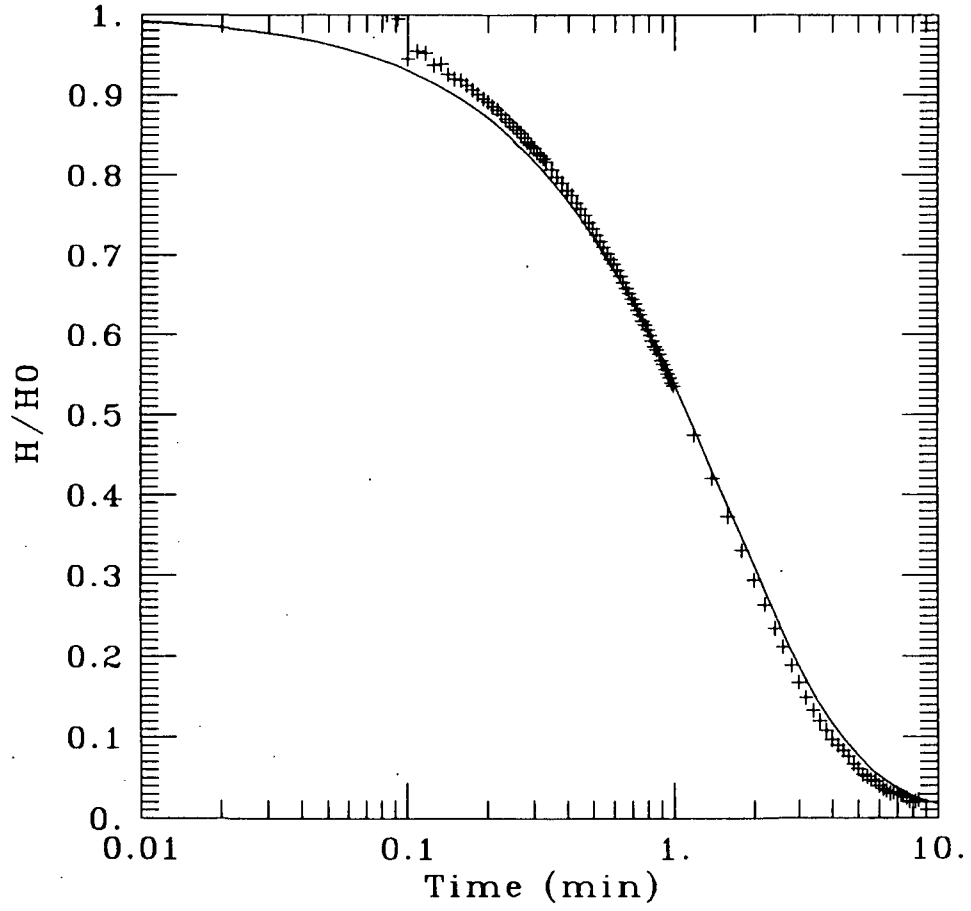
ESTIMATED PARAMETERS
T = 0.008309 ft^2/min
S = 0.0001368

TEST DATA:
HO = 1.747 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0042

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-014I



DATA SET:
MW-014I.DAT
07/08/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
23 MAY 94

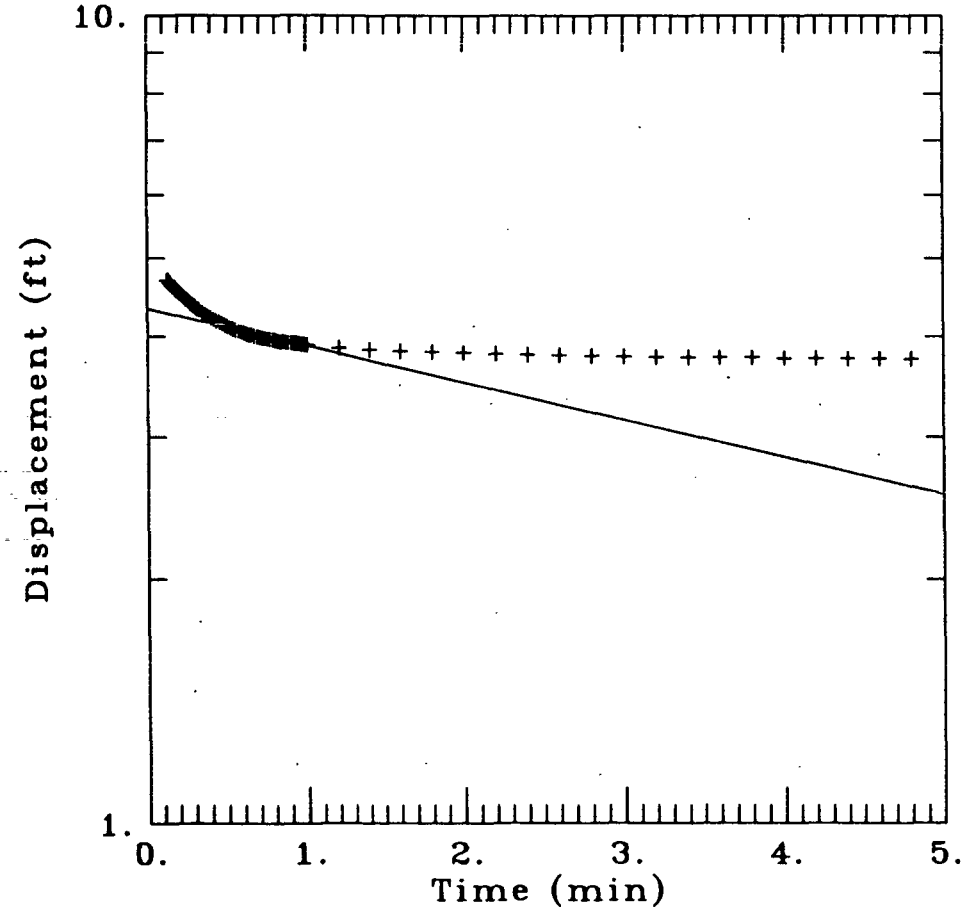
ESTIMATED PARAMETERS:
T = 0.01946 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.649 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0043

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-015



DATA SET:
mw-015a.dat
07/25/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

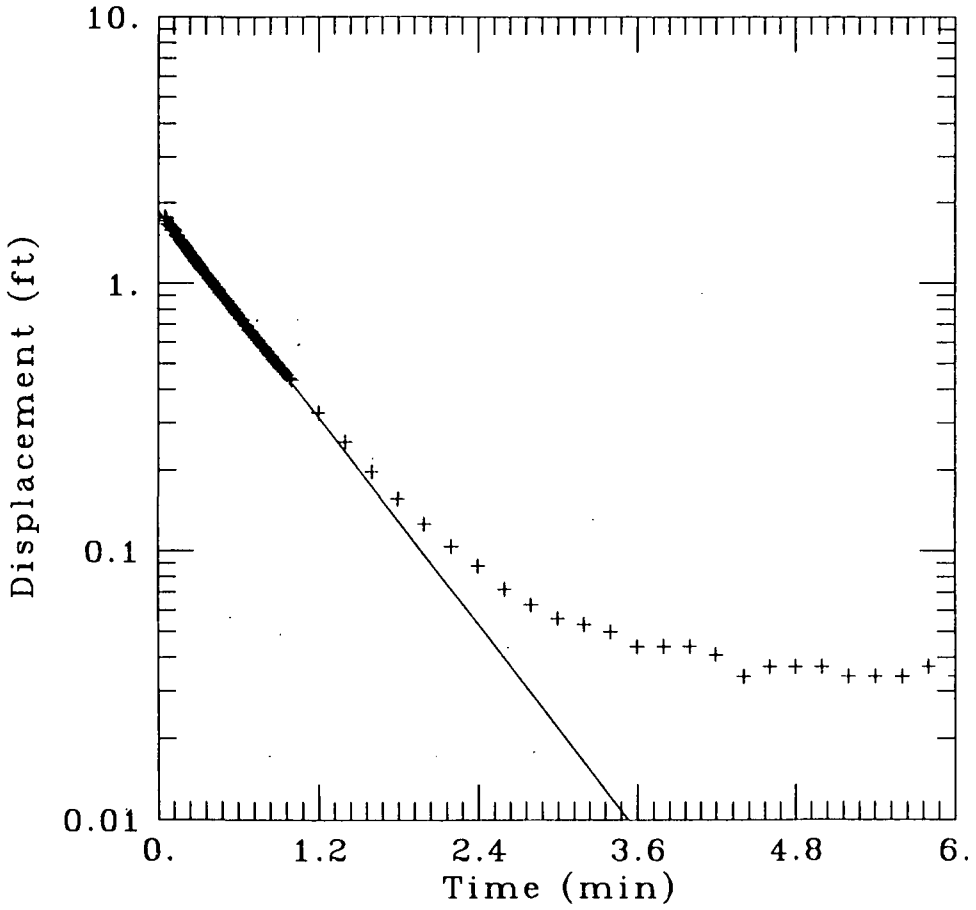
ESTIMATED PARAMETERS:
K = 0.0004999 ft/min
y0 = 4.331 ft

TEST DATA:
H0 = 0.822 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.06 ft
H = 9.06 ft

001160.0044

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-016



DATA SET:
mw-016a.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 May 94

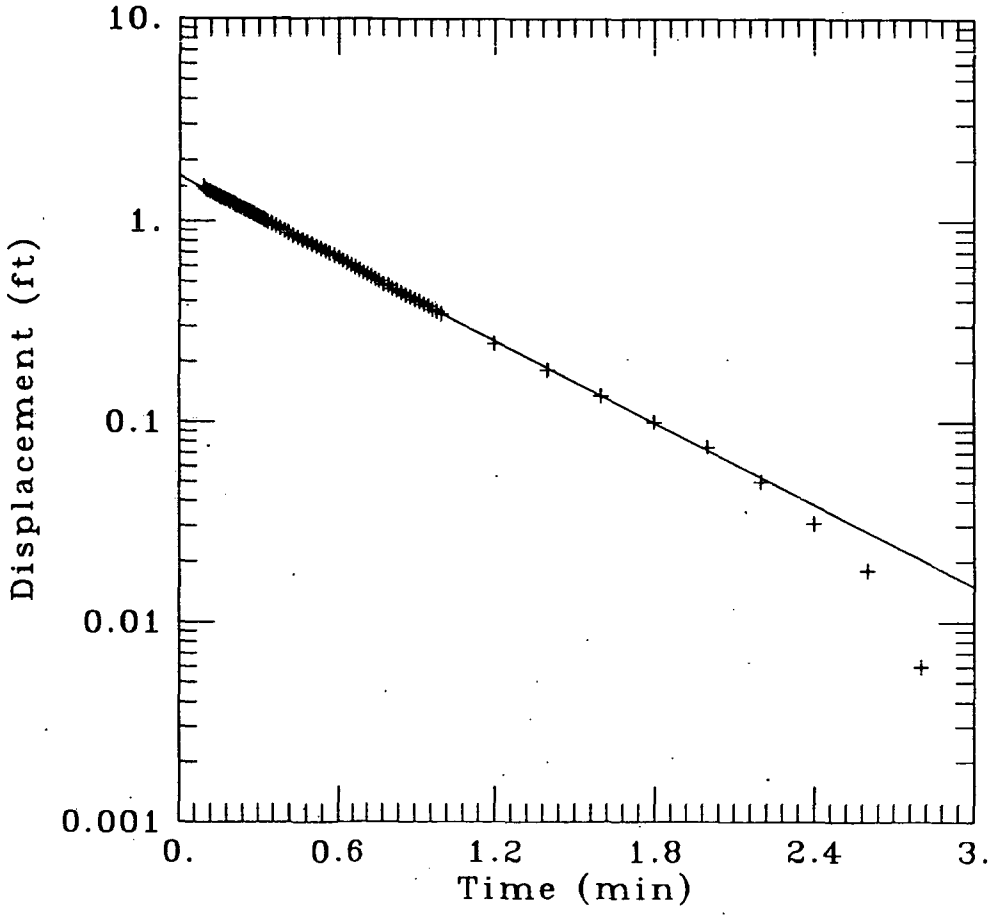
ESTIMATED PARAMETERS:
K = 0.002195 ft/min
y0 = 1.86 ft

TEST DATA:
H0 = 1.775 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 69. ft

001160.0045

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-016I



DATA SET:
mw-016i.dat
06/21/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
23 MAY 94

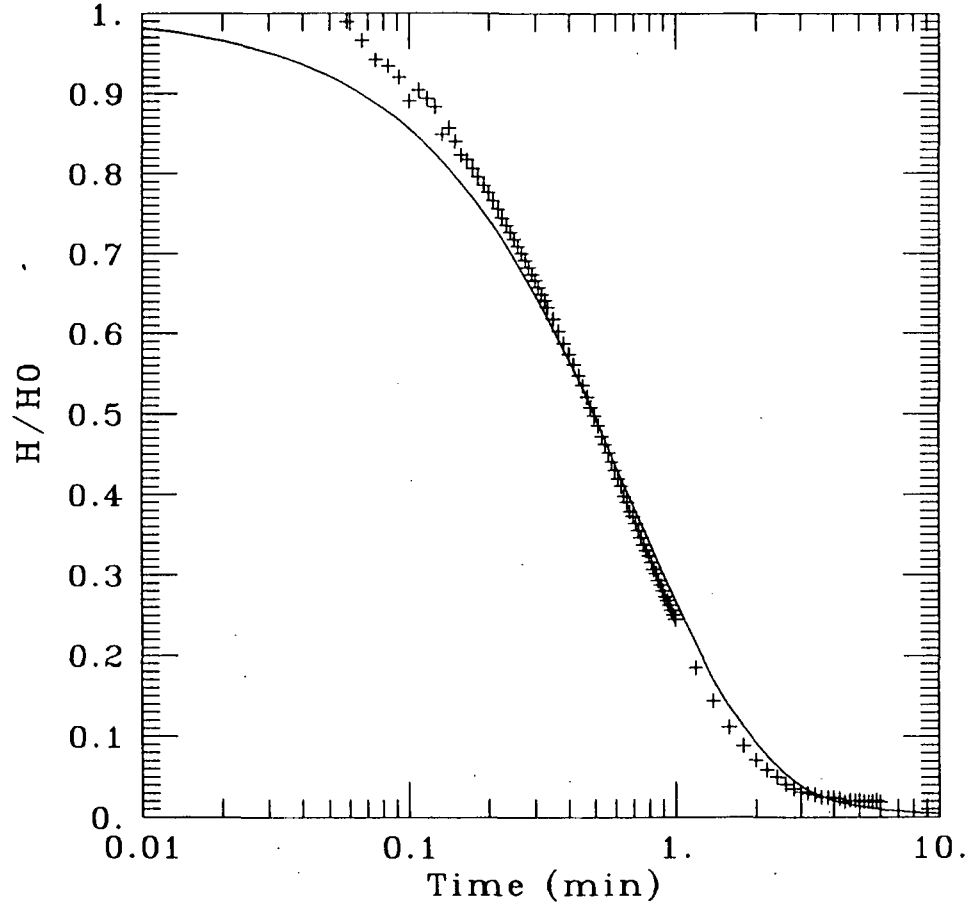
ESTIMATED PARAMETERS:
K = 0.002331 ft/min
y0 = 1.675 ft

TEST DATA:
H0 = 1.476 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 69. ft

001160.0046

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-016



DATA SET:
mw-016a dat
07/19/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al
TEST DATE:
23 May 94

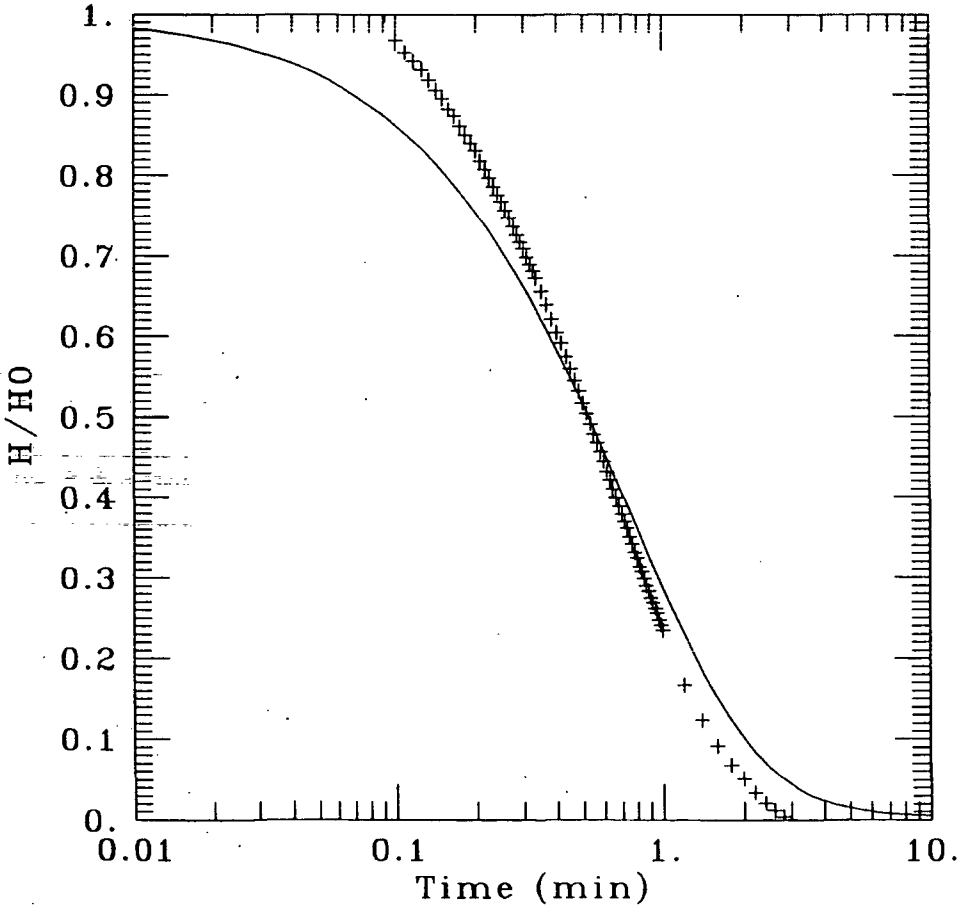
ESTIMATED PARAMETERS:
T = 0.04444 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.775 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0047

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-016I



DATA SET:
MW-016I.DAT
07/08/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
23 MAY 94

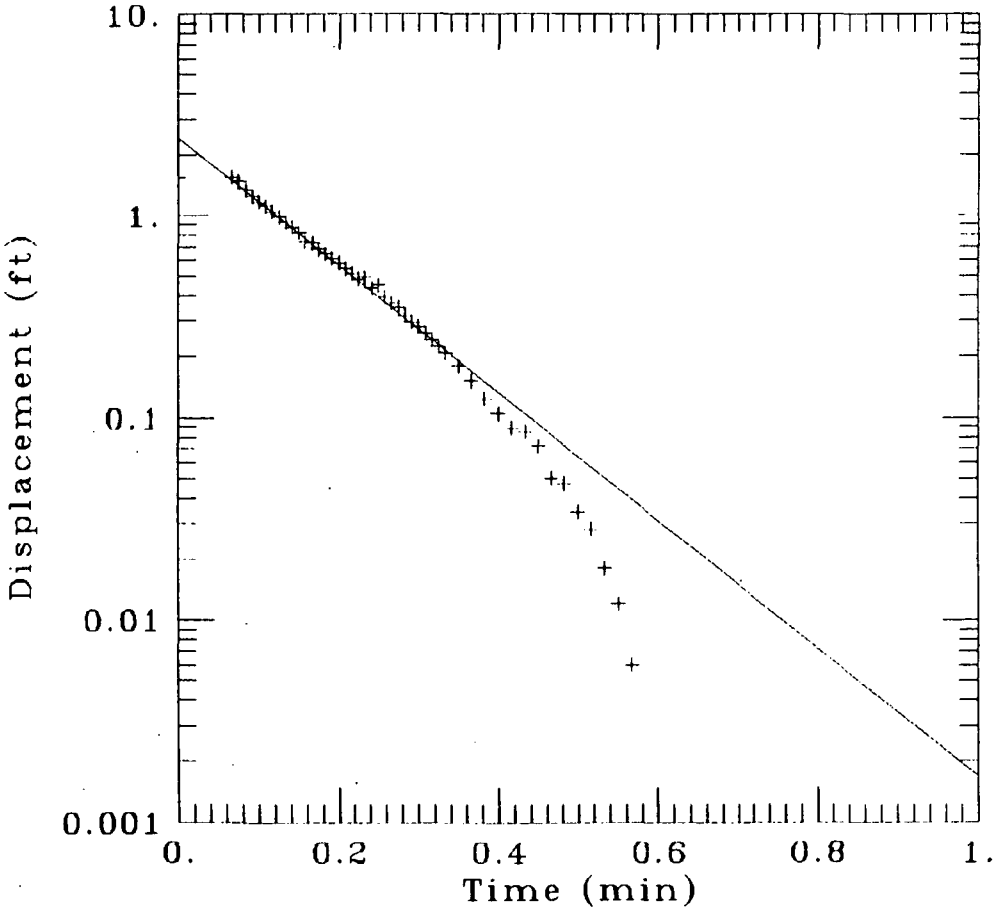
ESTIMATED PARAMETERS:
T = 0.042 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.476 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0048

Ecology & Environment, Inc.	Client USEPA
	Location: Agricultural Street Landfill

MW-017



DATA SET
MW-017A.DAT
06/23/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE
24 May 94

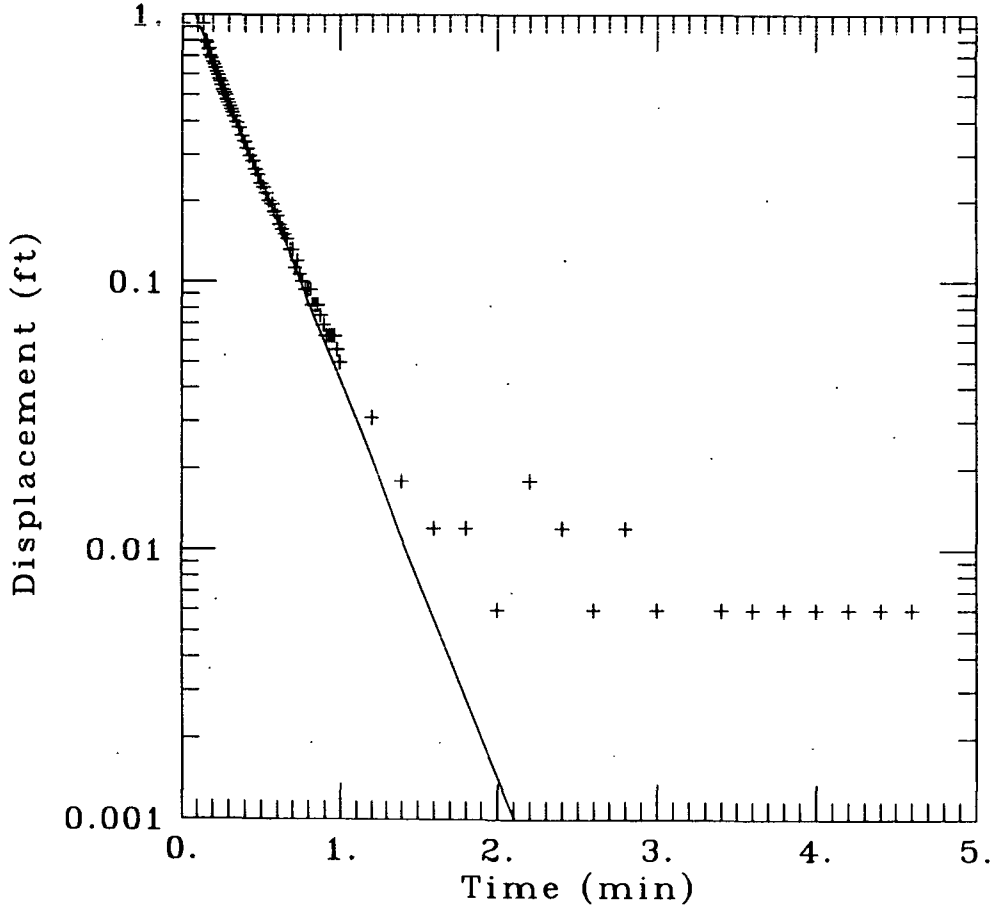
ESTIMATED PARAMETERS:
K = 0.006869 ft/min
y0 = 2.436 ft

TEST DATA
H0 = 1.544 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10 ft
b = 13.05 ft
H = 13.05 ft

001160.0049

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-017I



DATA SET:
mw-017i.dat
06/21/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 MAY 94

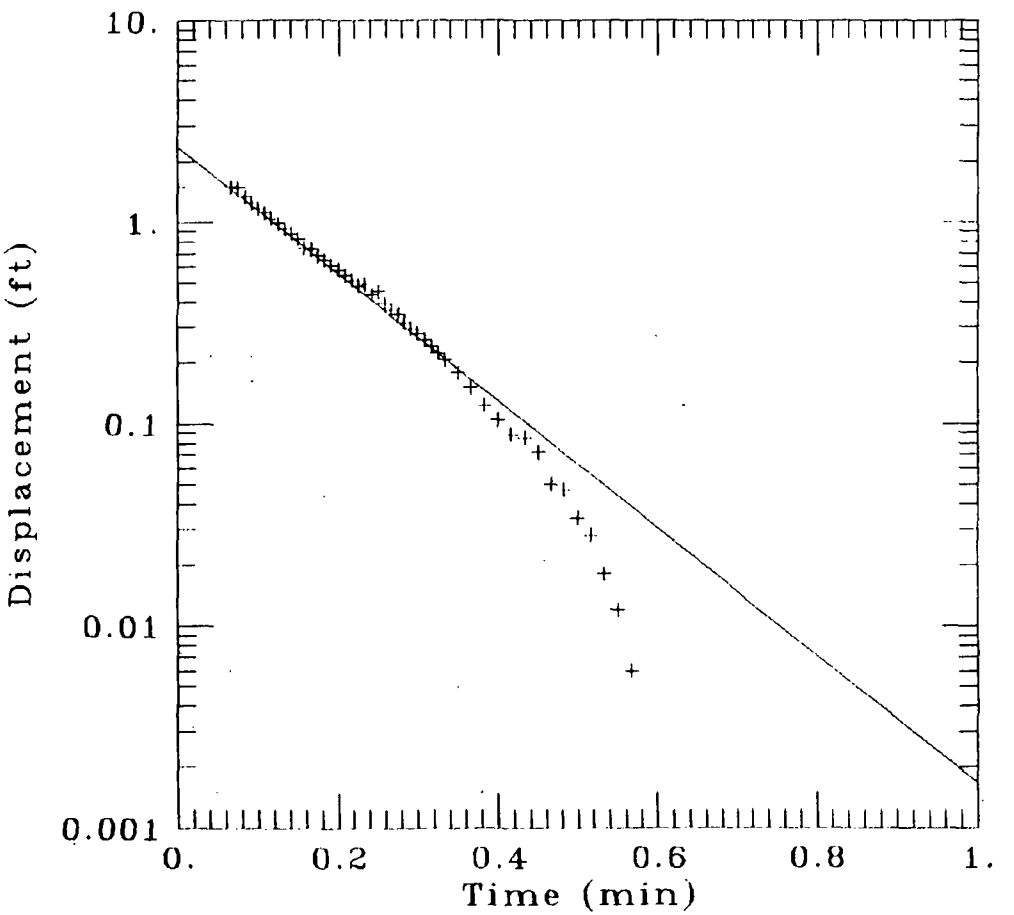
ESTIMATED PARAMETERS:
K = 0.003234 ft/min
y0 = 1.331 ft

TEST DATA:
H0 = 0.924 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 13.05 ft
H = 13.05 ft

001160.0050

Ecology & Environment, Inc.	Client USEPA Location: Agricultural Street Landfill

MW-018



DATA SET:
MW-018A.DAT
06/23/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE
24 May 94

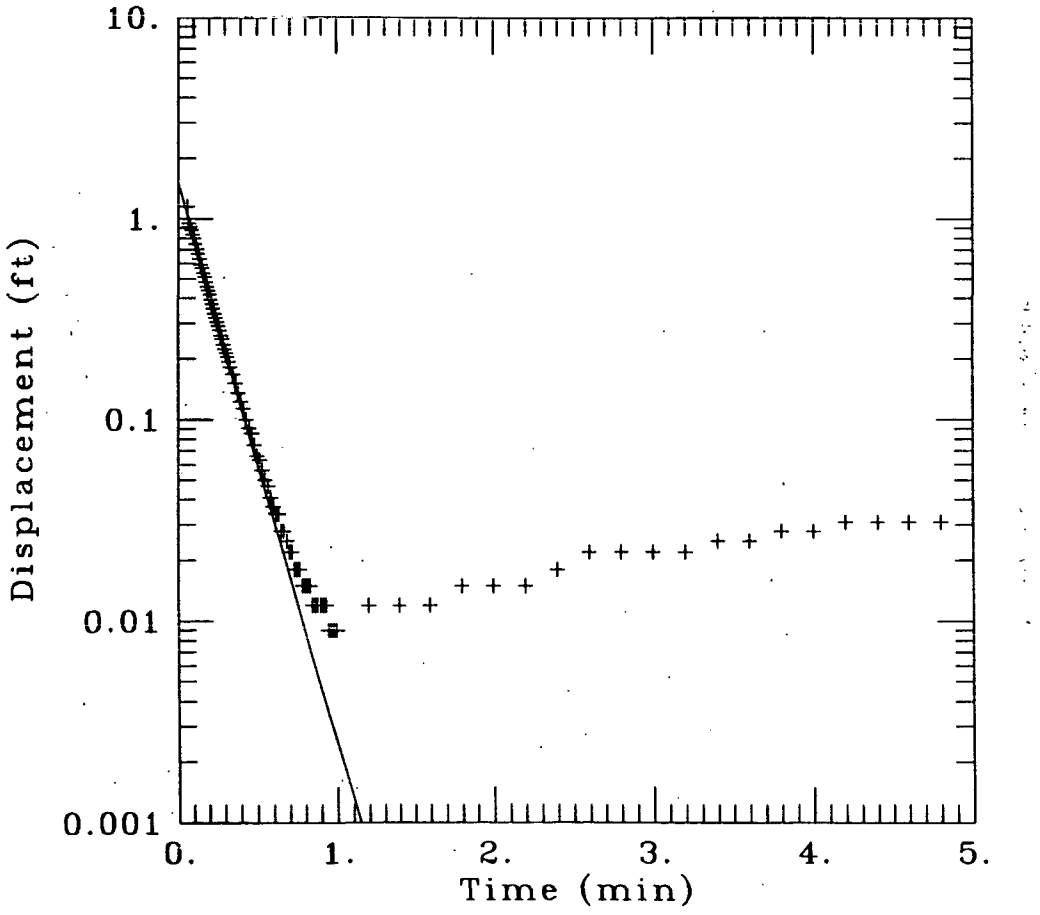
ESTIMATED PARAMETERS:
K = 0.01066 ft/min
y0 = 2.381 ft

TEST DATA
H0 = 1.492 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 64. ft

001160.0051

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-018I



DATA SET:
mw-018i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

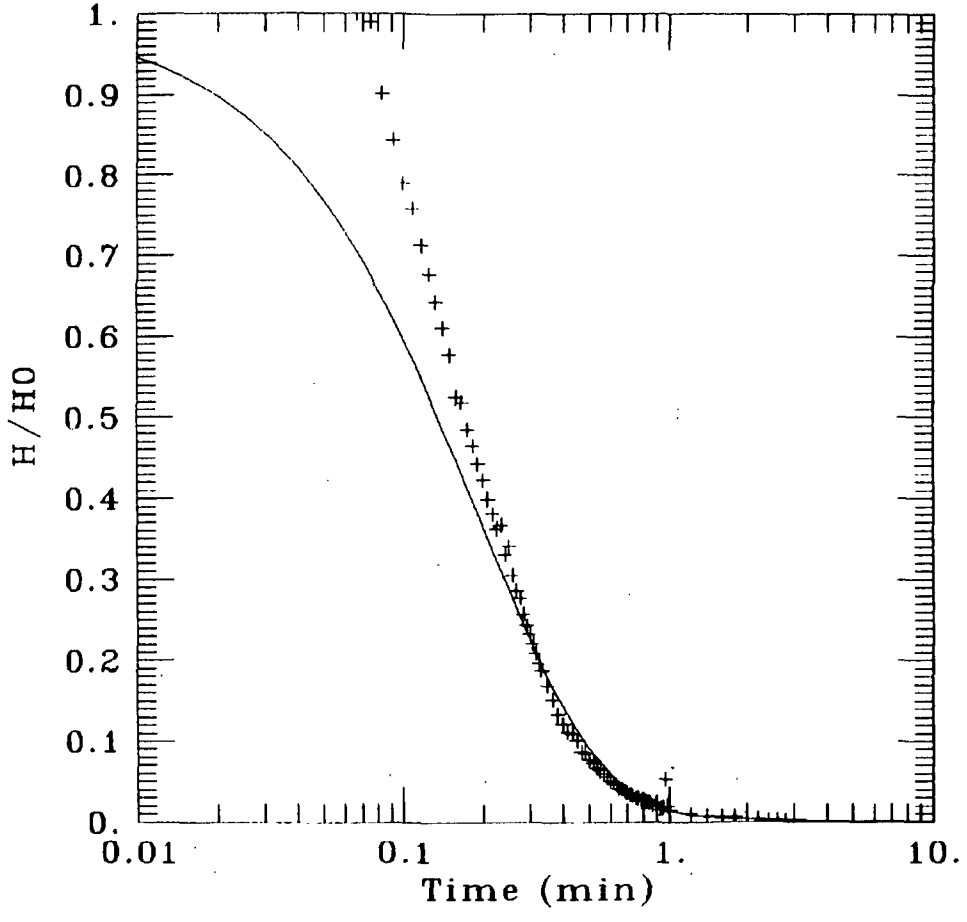
TEST DATE:
24 MAY 94

ESTIMATED PARAMETERS:
K = 0.009428 ft/min
y0 = 1.513 ft

TEST DATA:
H0 = 1.148 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 64. ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-018



DATA SET:
mw-018a2 dat
06/30/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
24 May 94

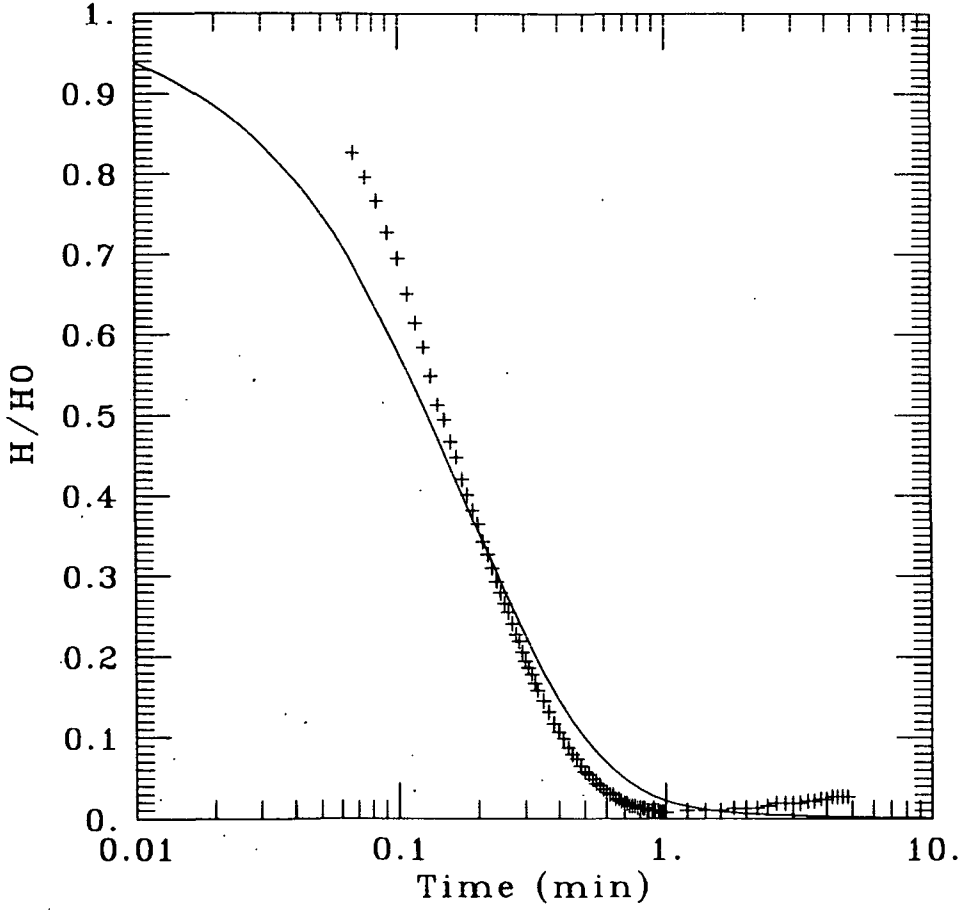
ESTIMATED PARAMETERS:
T = 0 3751 ft^2/min
S = 7 4385E-19

TEST DATA:
HO = 1 58 ft
rc = 0 083 ft
rw = 0 166 ft

001160.0053

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-018I



DATA SET:
MW-018I.DAT
07/08/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
24 MAY 94

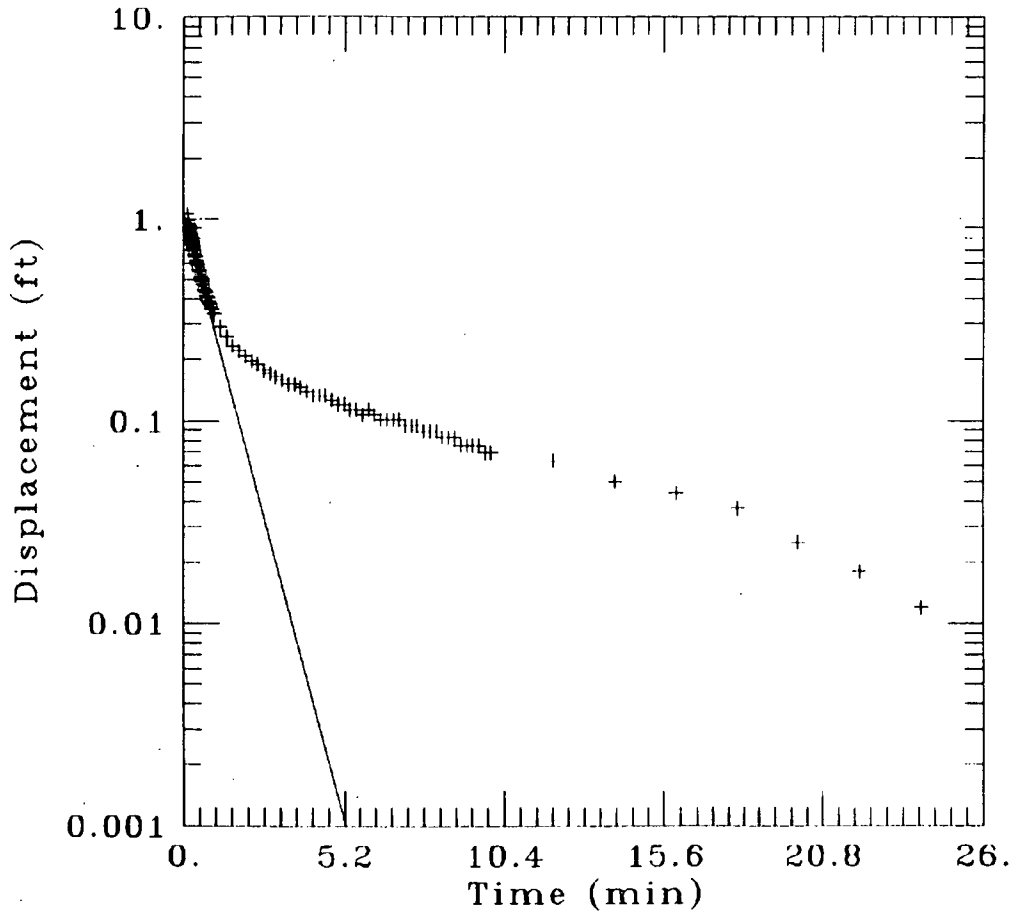
ESTIMATED PARAMETERS:
T = 0.1705 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.148 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0054

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-019



DATA SET:
MW-019A.DAT
06/23/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 May 94

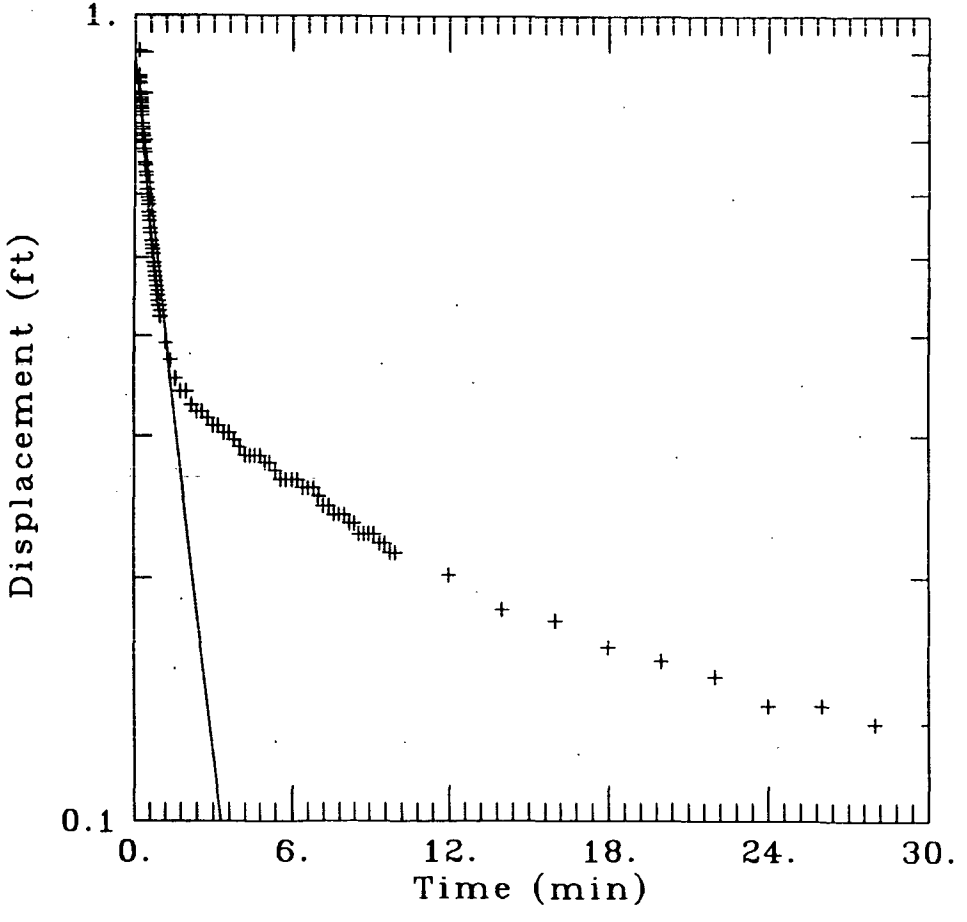
ESTIMATED PARAMETERS:
K = 0.001211 ft/min
y0 = 1.087 ft

TEST DATA:
H0 = 1.056 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10 ft
b = 11.09 ft
H = 11.09 ft

001160.0055

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-019I



DATA SET:
mw-019i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 MAY 94

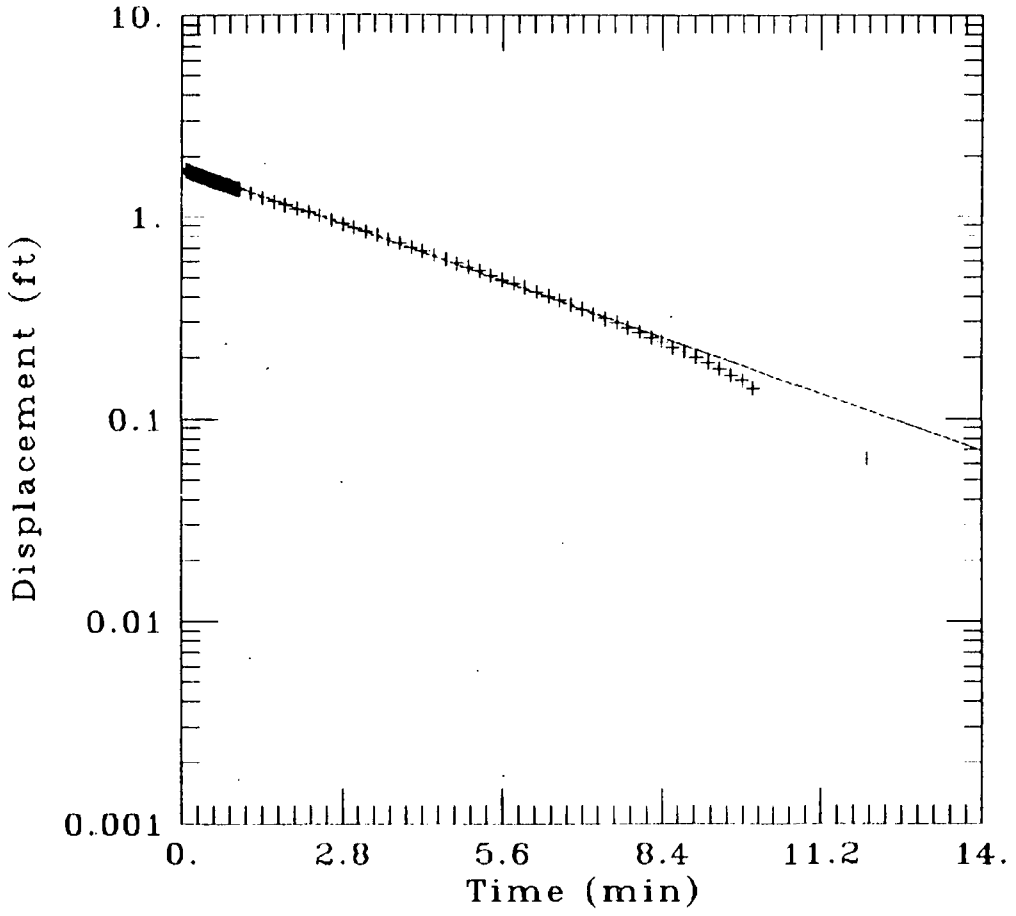
ESTIMATED PARAMETERS:
K = 0.0006072 ft/min
y0 = 0.8905 ft

TEST DATA:
H0 = 0.904 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.09 ft
H = 11.09 ft

001160.0056

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-020



DATA SET:
MW-020A.DAT
06/23/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 May 94

ESTIMATED PARAMETERS:
K = 0.0003393 ft/min
y0 = 1.737 ft

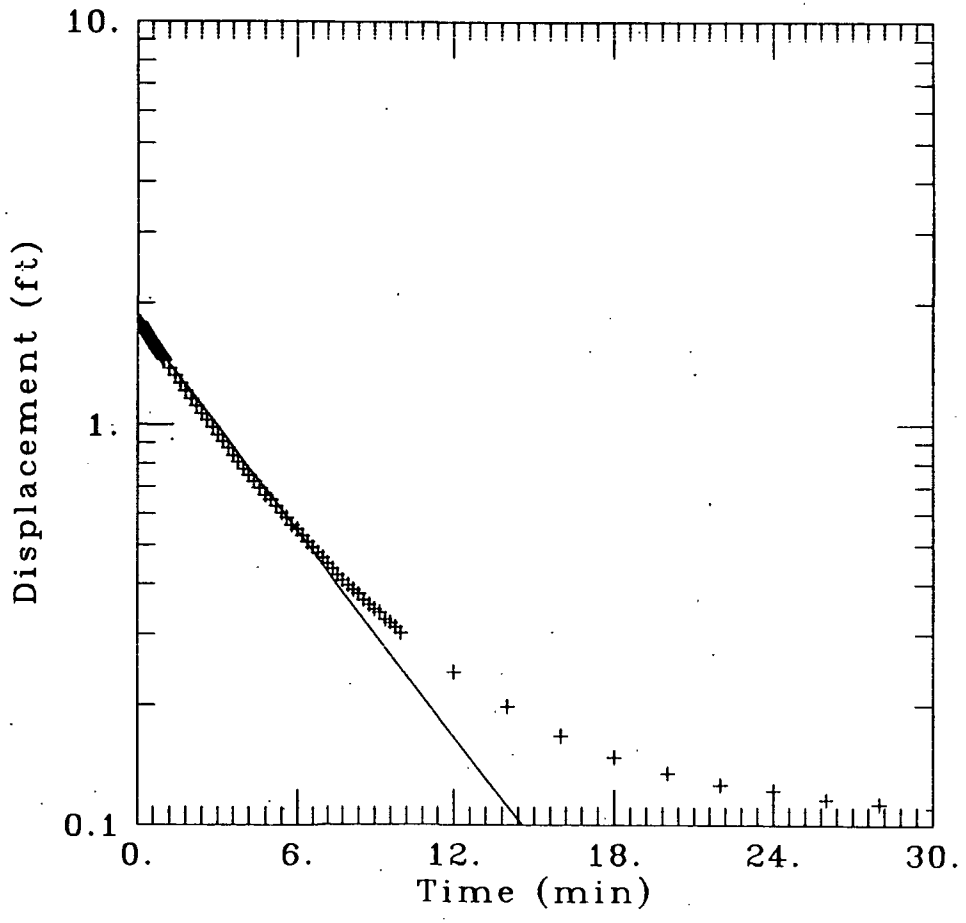
TEST DATA:
H0 = 1.699 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10 ft
b = 10 ft
H = 67. ft

99-0

001160.0057

Ecology & Environment, Inc.	Client: **USEPA**
	Location: **Agricultural Street Landfill**

MW-020I



DATA SET:
mw-020i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 MAY 94

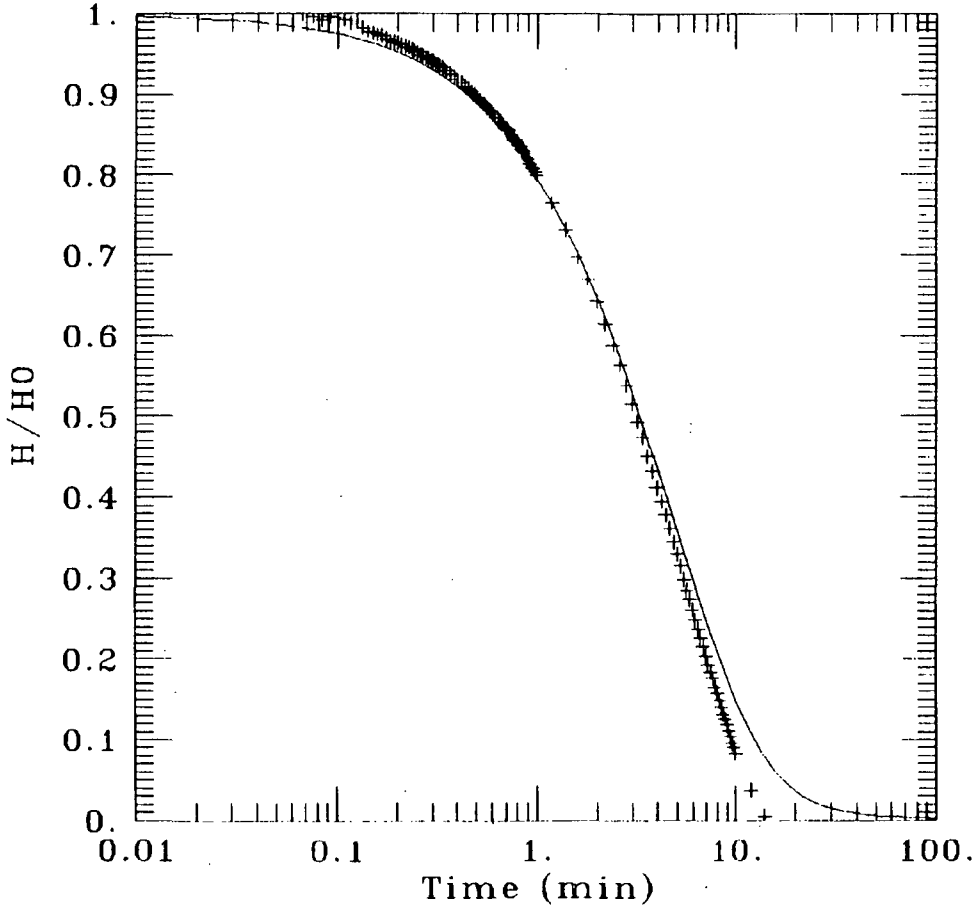
ESTIMATED PARAMETERS:
K = 0.0002931 ft/min
y0 = 1.792 ft

TEST DATA:
H0 = 1.794 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 67. ft

001160.0058

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-020



DATA SET:
MW-020A.DAT
06/29/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
24 May 94

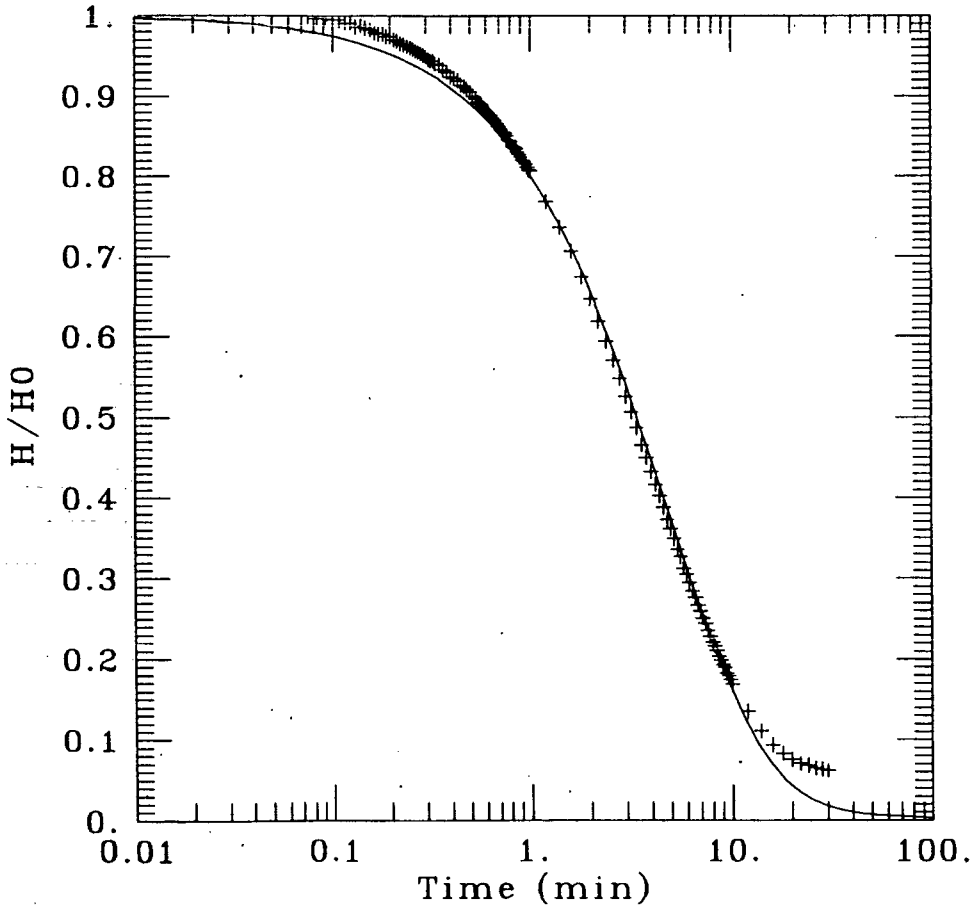
ESTIMATED PARAMETERS:
T = 0.007565 ft^2/min
S = 9.9874E-10

TEST DATA:
H0 = 1.699 ft
rc = 0.083 ft
rw = 0.166 ft

0-68

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-020I



DATA SET:
MW-020I.DAT
07/08/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

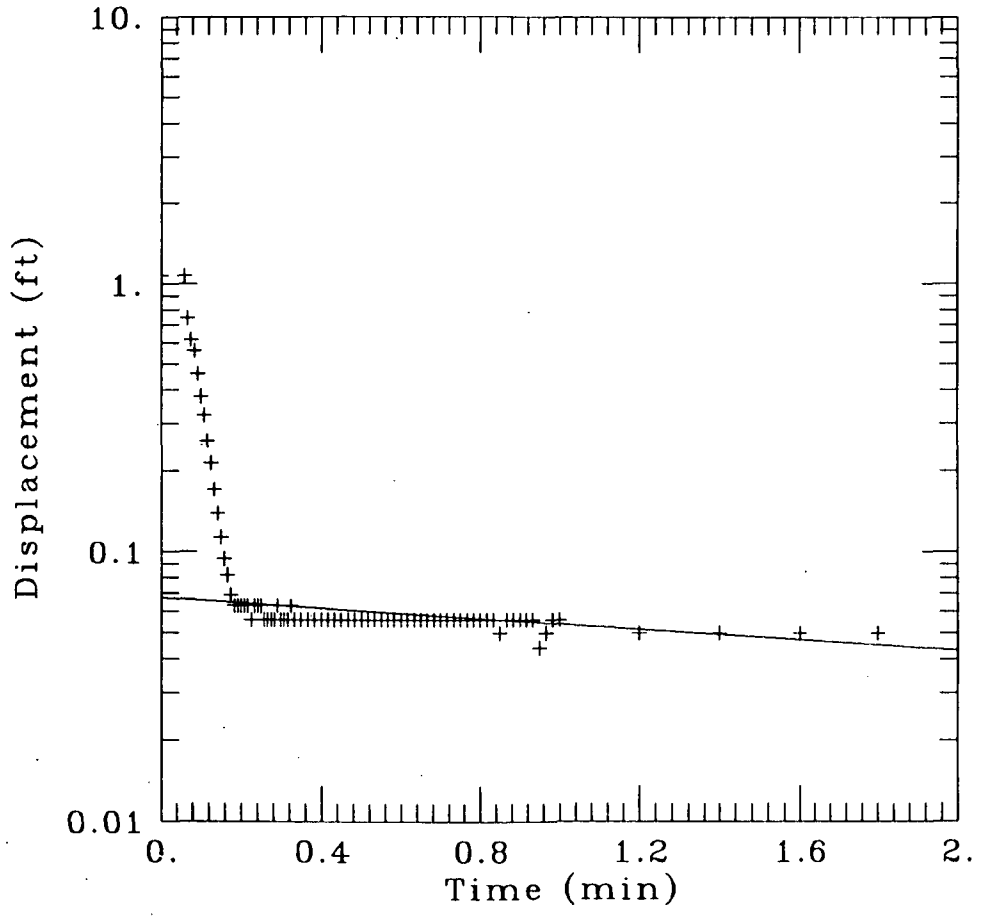
TEST DATE:
24 MAY 94

ESTIMATED PARAMETERS:
T = 0.006454 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.794 ft
rc = 0.083 ft
rw = 0.166 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-021



DATA SET:
mw-021a dat
07/22/94

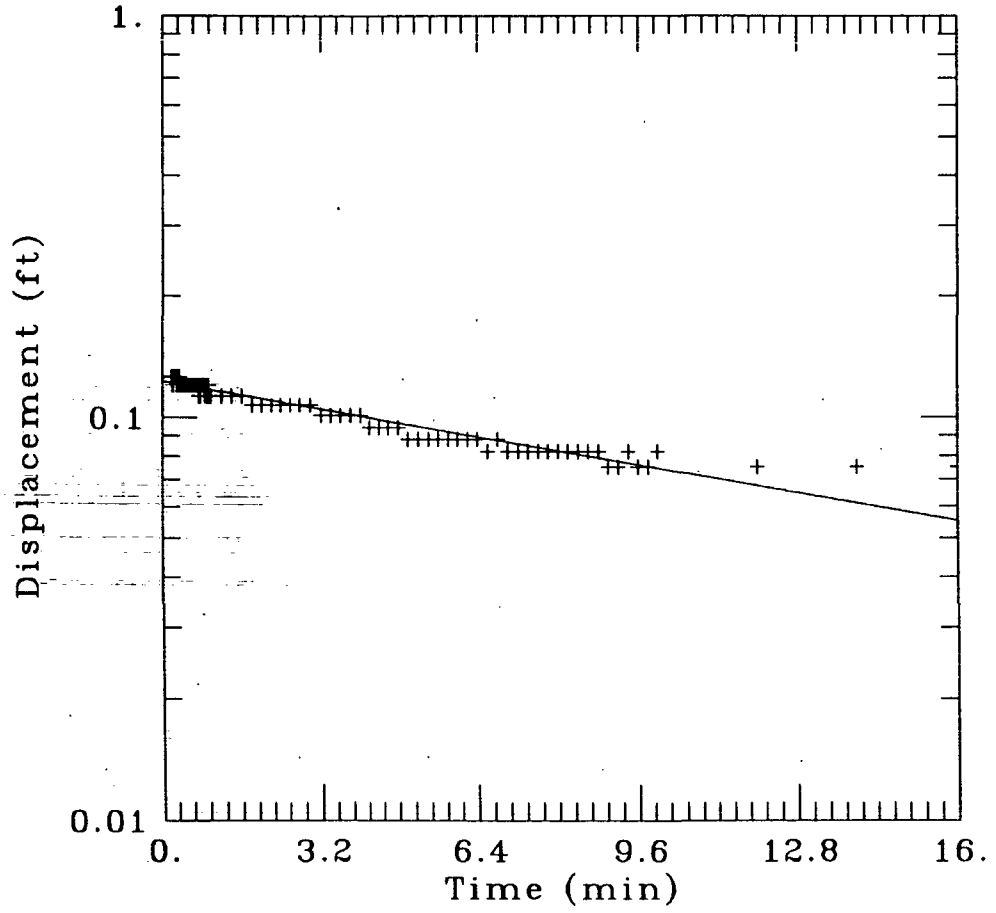
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 MAY 94

ESTIMATED PARAMETERS:
K = 0 001072 ft/min
y0 = 0.06761 ft

TEST DATA:
H0 = 1 074 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.67 ft
H = 9.67 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-021I



DATA SET:
mw-021i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 MAY 94

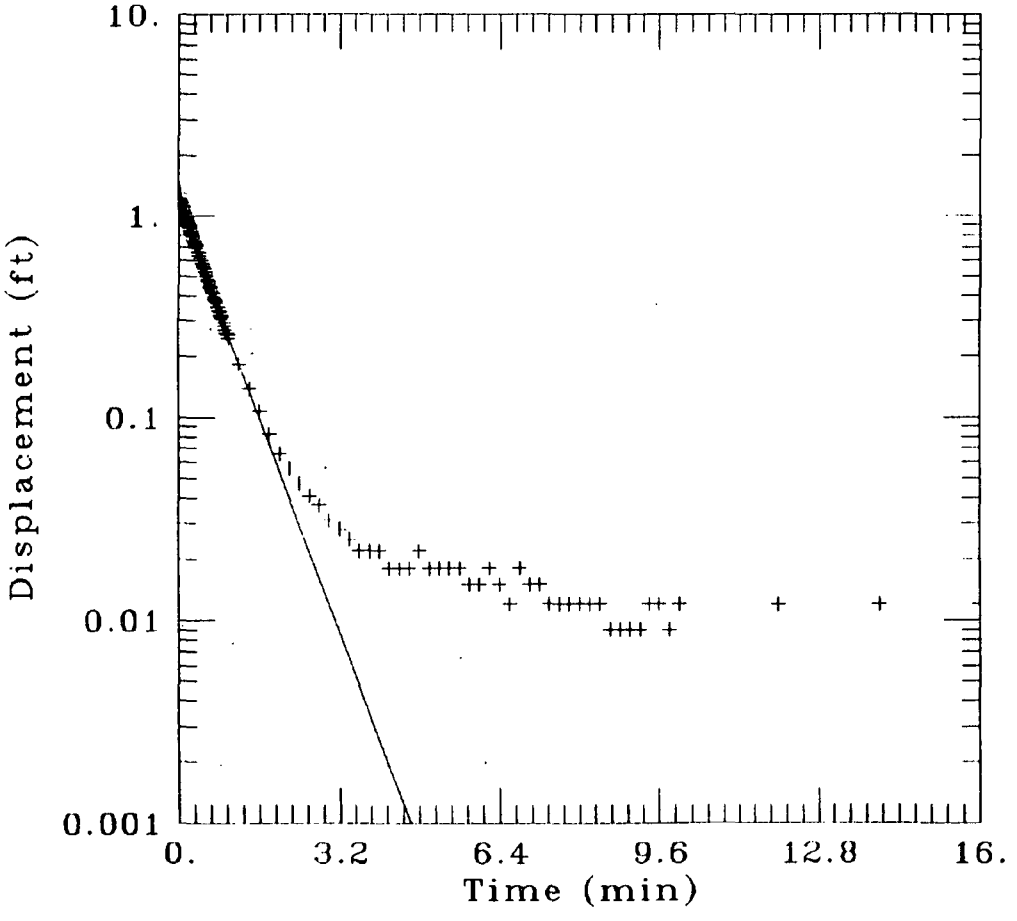
ESTIMATED PARAMETERS:
K = 0.0002388 ft/min
y0 = 0.1228 ft

TEST DATA:
H0 = 0.126 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.67 ft
H = 9.67 ft

001160.0062

Ecology & Environment, Inc.	Client: USEPA
	Location Agricultural Street Landfill

MW-022



DATA SET:
MW-022A DAT
06/23/94

AQUIFER TYPE
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 May 94

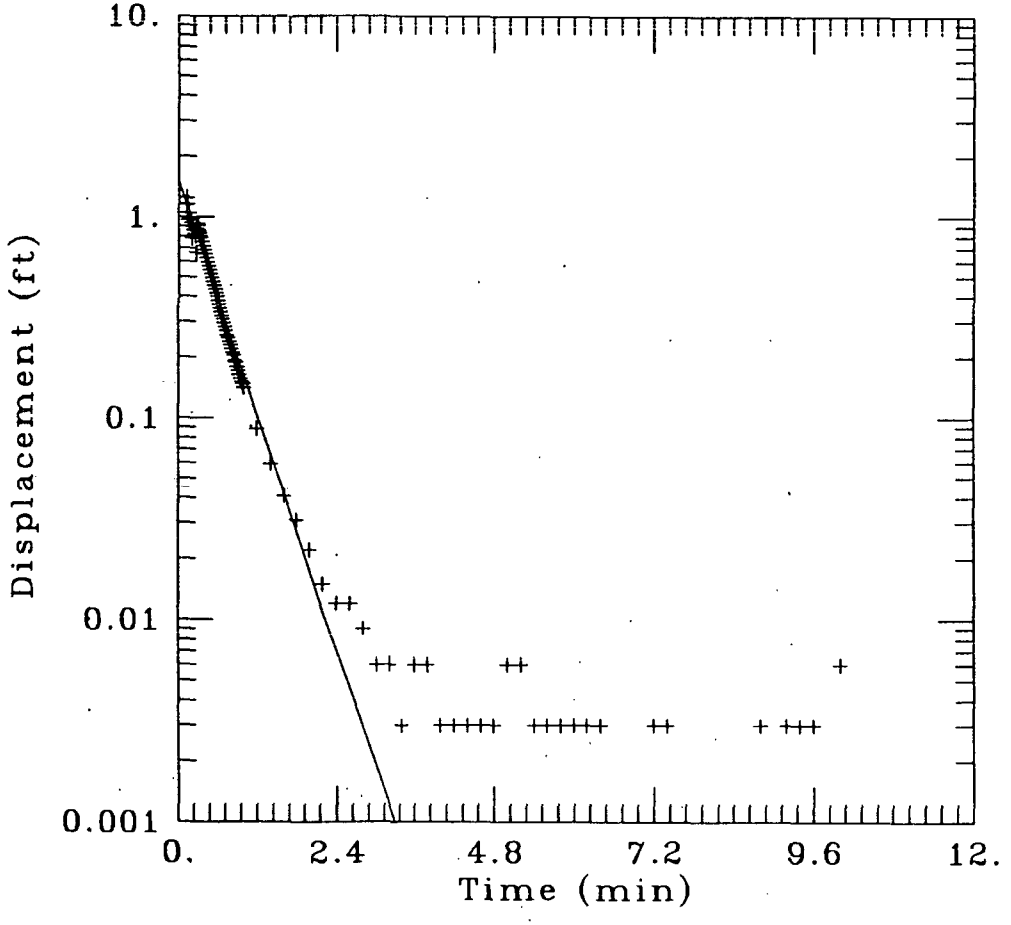
ESTIMATED PARAMETERS
K = 0 00228 ft/min
y0 = 1 146 ft

TEST DATA:
H0 = 1 299 ft
rc = 0 083 ft
rw = 0 166 ft
L = 10 ft
b = 10 ft
H = 74. ft

001160.0063

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-022I



DATA SET:
mw-022i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 MAY 94

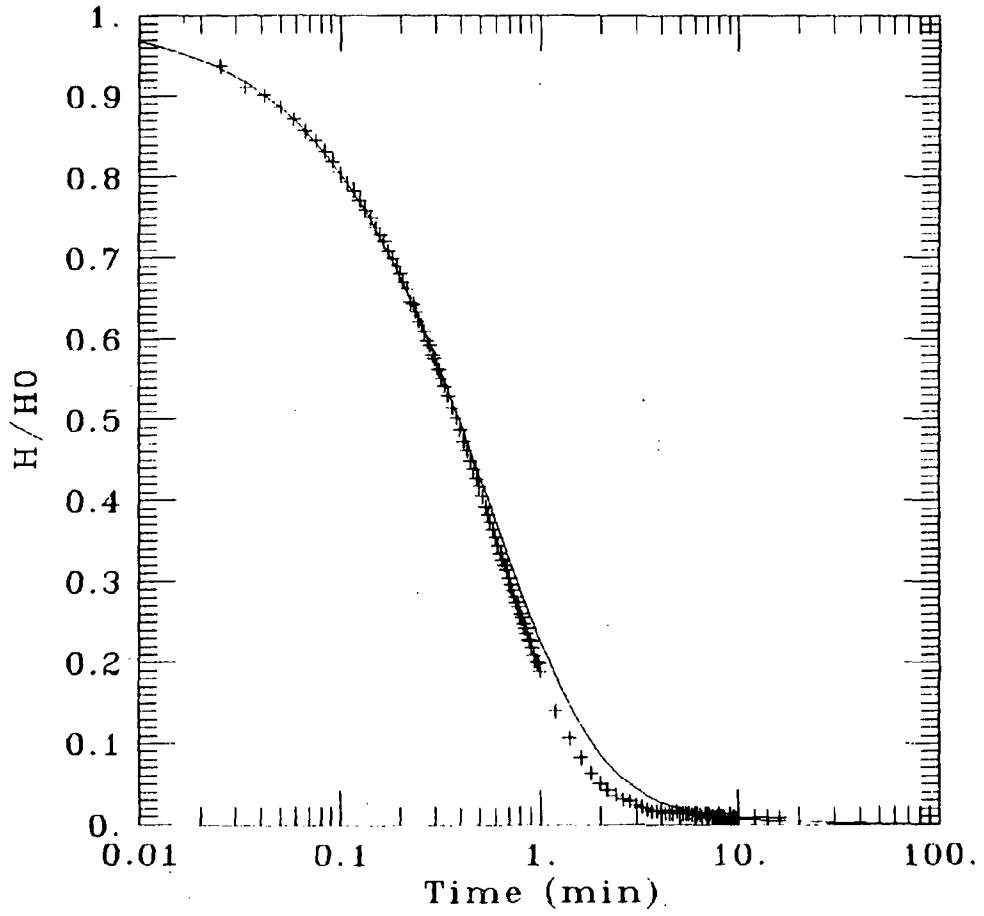
ESTIMATED PARAMETERS:
K = 0.003326 ft/min
y0 = 1.489 ft

TEST DATA:
H0 = 1.248 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 74. ft

001160.0064

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-022



DATA SET:
MW-022A.DAT
06/30/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
24 May 94

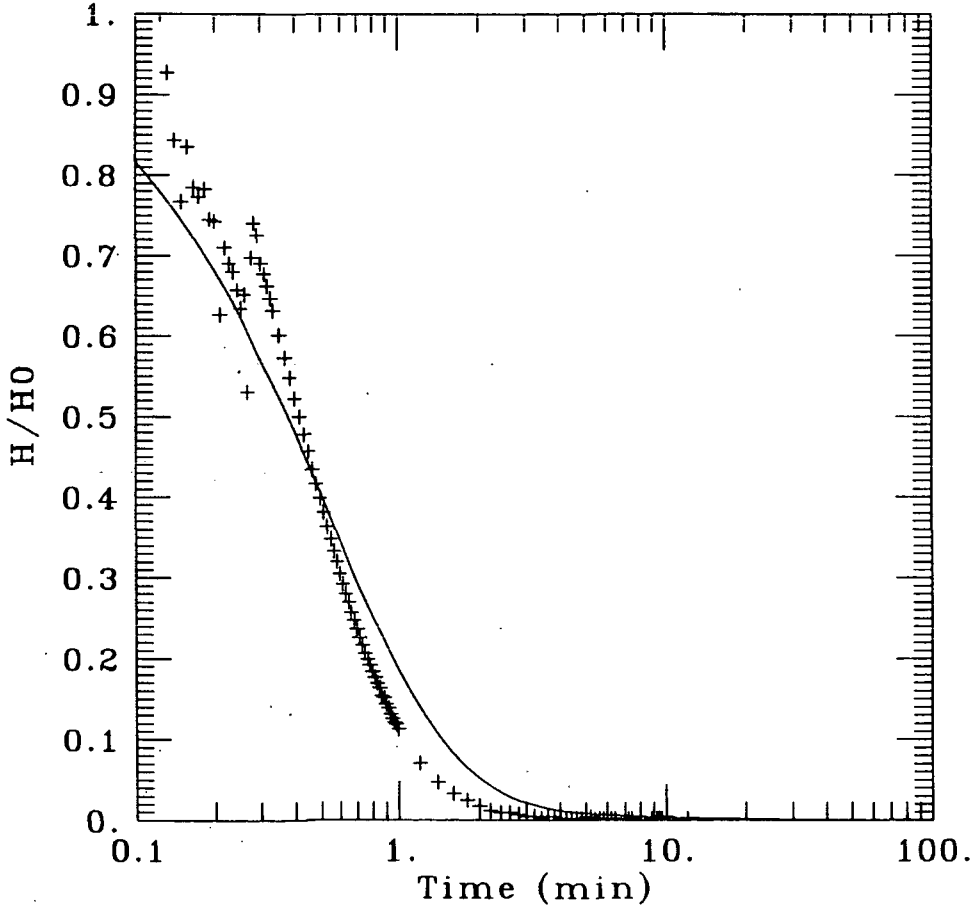
ESTIMATED PARAMETERS:
T = 0.02582 ft^2/min
S = 0.0001

TEST DATA:
HO = 1.299 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0065

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-022I



DATA SET:
mw-022i.dat
07/11/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
24 MAY 94

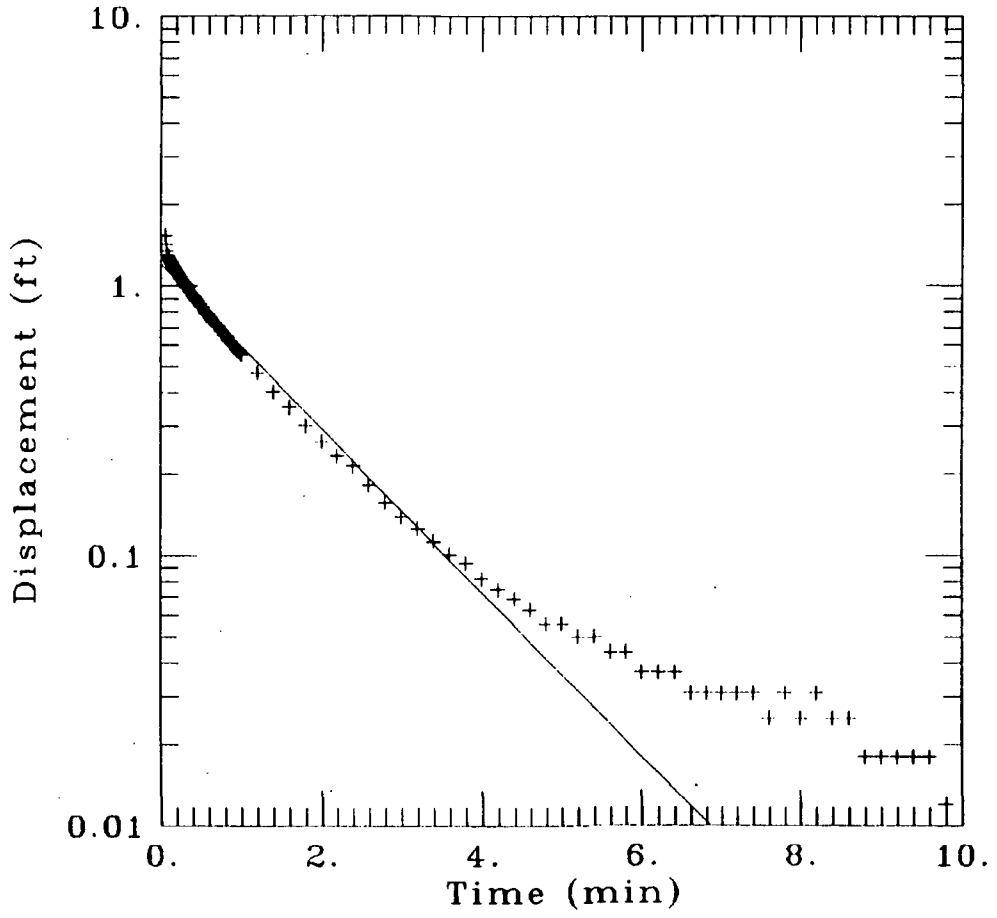
ESTIMATED PARAMETERS:
T = 0.05857 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.248 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0066

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-023



DATA SET:
MW-023A DAT
06/23/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 May 94

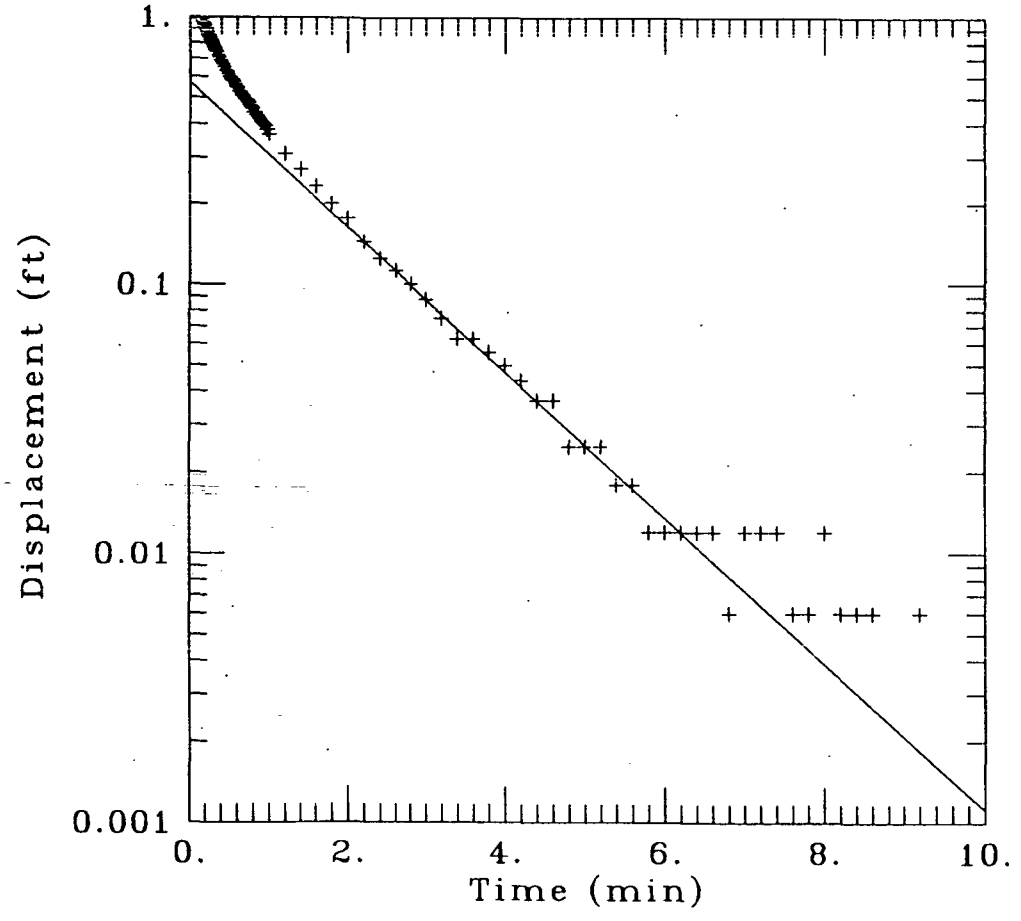
ESTIMATED PARAMETERS
K = 0 0006257 ft/min
y0 = 1 204 ft

TEST DATA:
H0 = 1 536 ft
rc = 0 083 ft
rw = 0 33 ft
L = 10 ft
b = 10 27 ft
H = 10 27 ft

001160.0067

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-023I



DATA SET:
mw-023i.dat
07/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 MAY 94

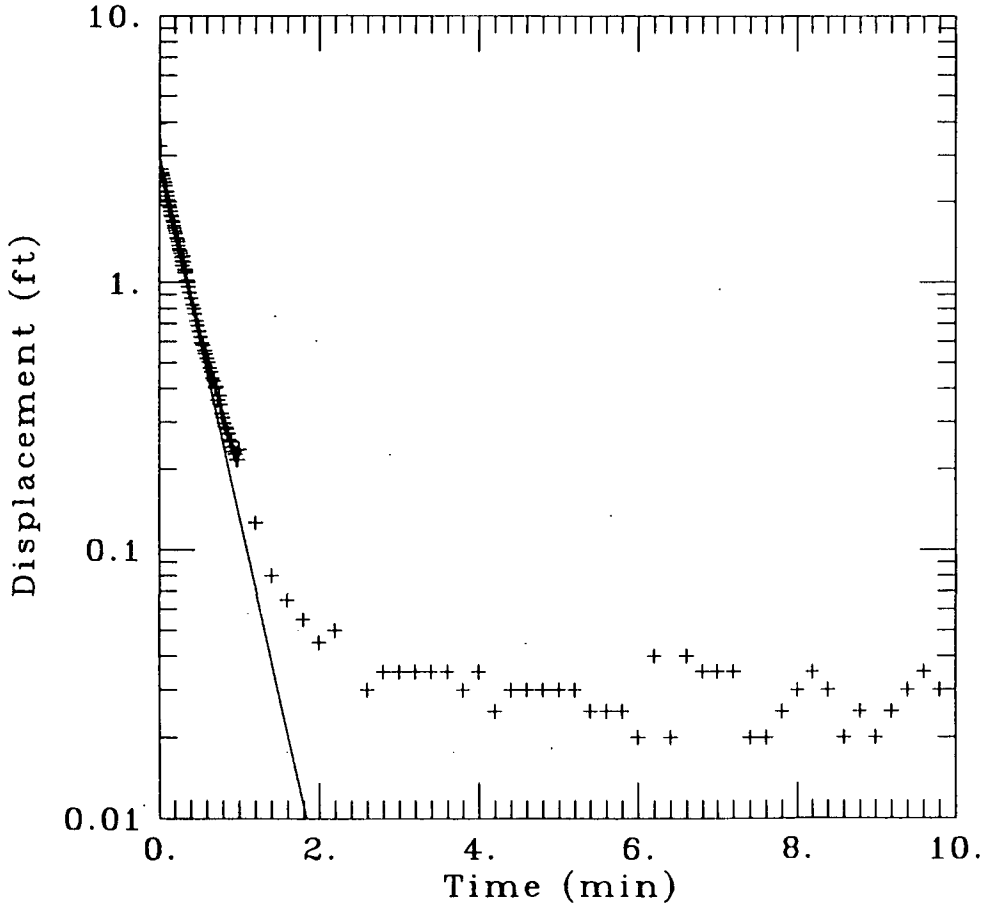
ESTIMATED PARAMETERS:
K = 0 0005577 ft/min
y0 = 0.5698 ft

TEST DATA:
H0 = 0.986 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 10.27 ft
H = 10.27 ft

001160.0068

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-024



DATA SET:
mw-024a.dat
07/19/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 May 94

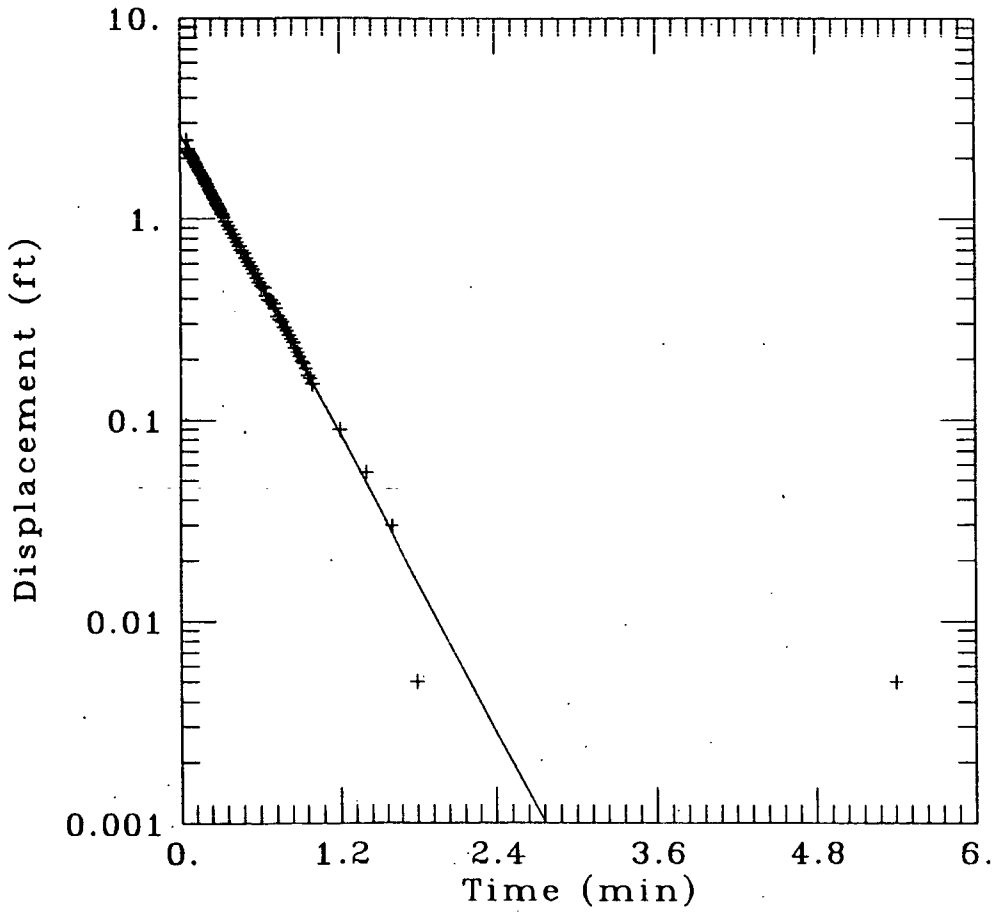
ESTIMATED PARAMETERS:
K = 0.004714 ft/min
y0 = 2.996 ft

TEST DATA:
H0 = 3.936 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 82. ft

001160.0069

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-024I



DATA SET:
mw-024i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

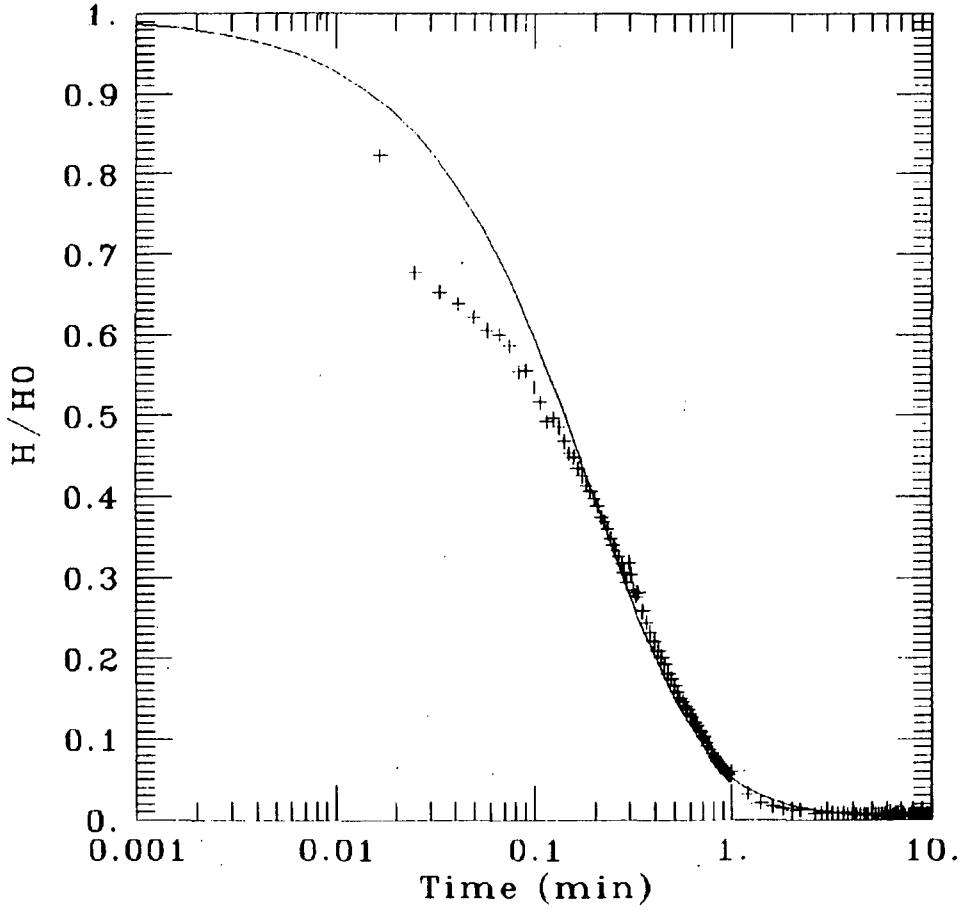
TEST DATE:
24 MAY 94

ESTIMATED PARAMETERS:
K = 0.004322 ft/min
y0 = 2.641 ft

TEST DATA:
H0 = 2.458 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 82. ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-024



DATA SET:
MW-024A.DAT
06/23/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

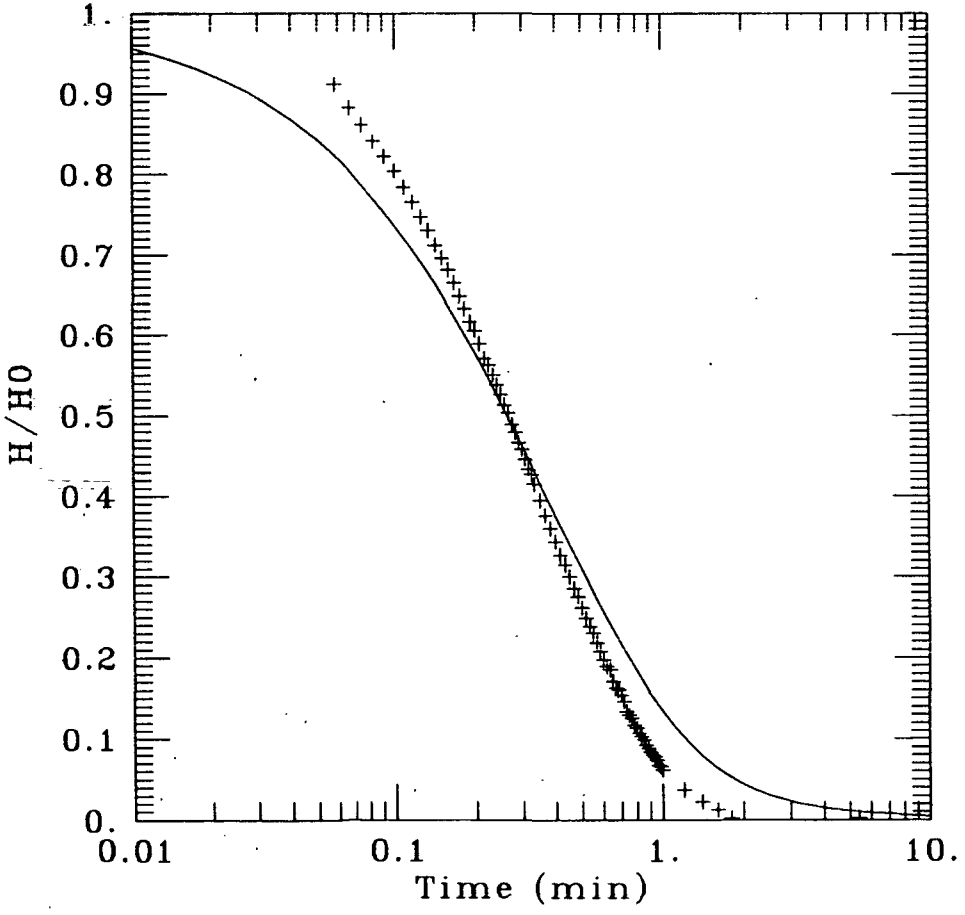
TEST DATE:
24 May 94

ESTIMATED PARAMETERS:
T = 0.06903 ft^2/min
S = 0.0001336

TEST DATA:
H0 = 3.936 ft
rc = 0.083 ft
rw = 0.166 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-024I



DATA SET:
mw-024i.dat
07/11/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

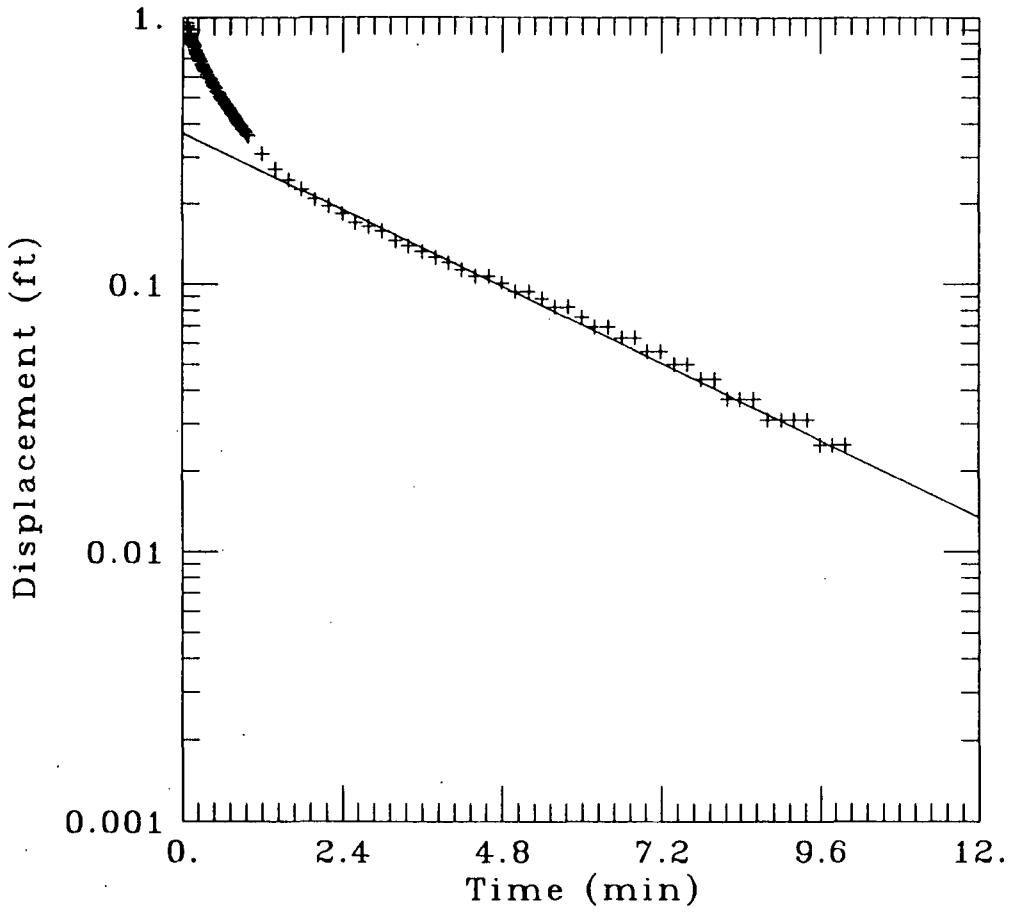
TEST DATE:
24 MAY 94

ESTIMATED PARAMETERS:
T = 0.03878 ft^2/min
S = 0.0001

TEST DATA:
H0 = 2.458 ft
rc = 0.083 ft
rw = 0.166 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-025



DATA SET:
mw-025a.dat
07/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 May 94

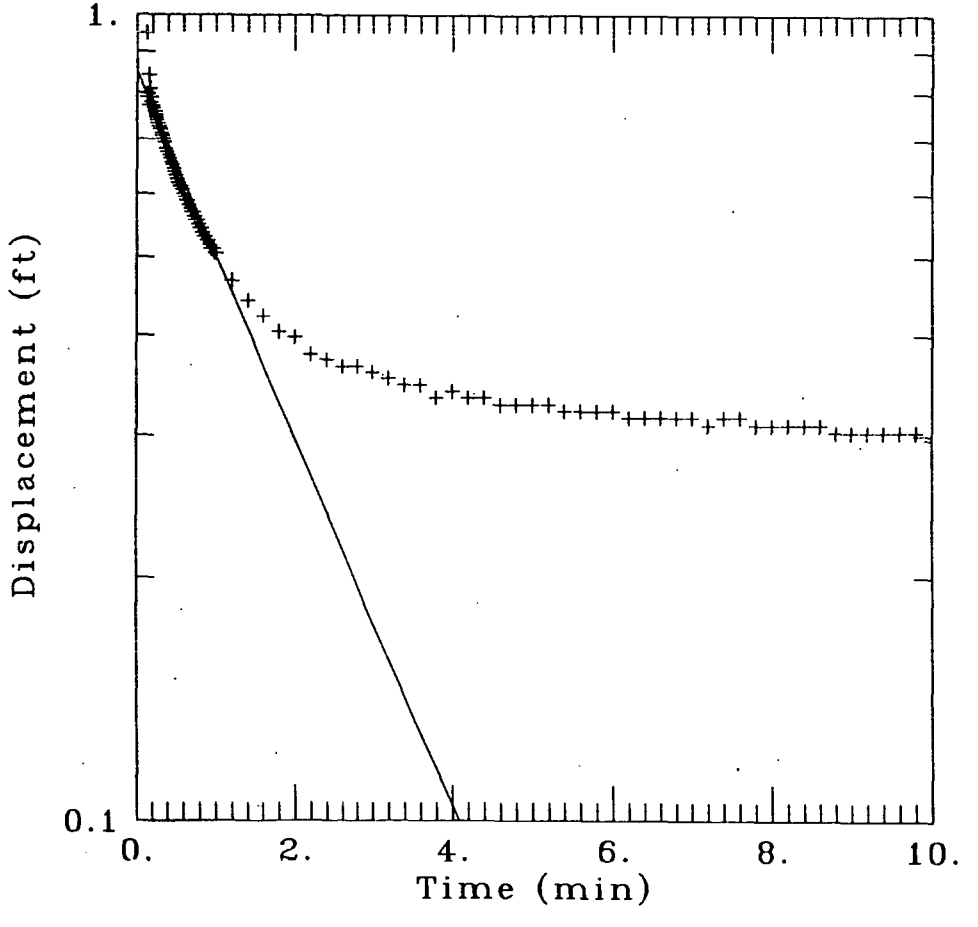
ESTIMATED PARAMETERS:
K = 0.0002482 ft/min
y0 = 0.3692 ft

TEST DATA:
H0 = 0.955 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 10.46 ft
H = 10.46 ft

001160.0073

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-025I



DATA SET:
mw-025i.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 MAY 94

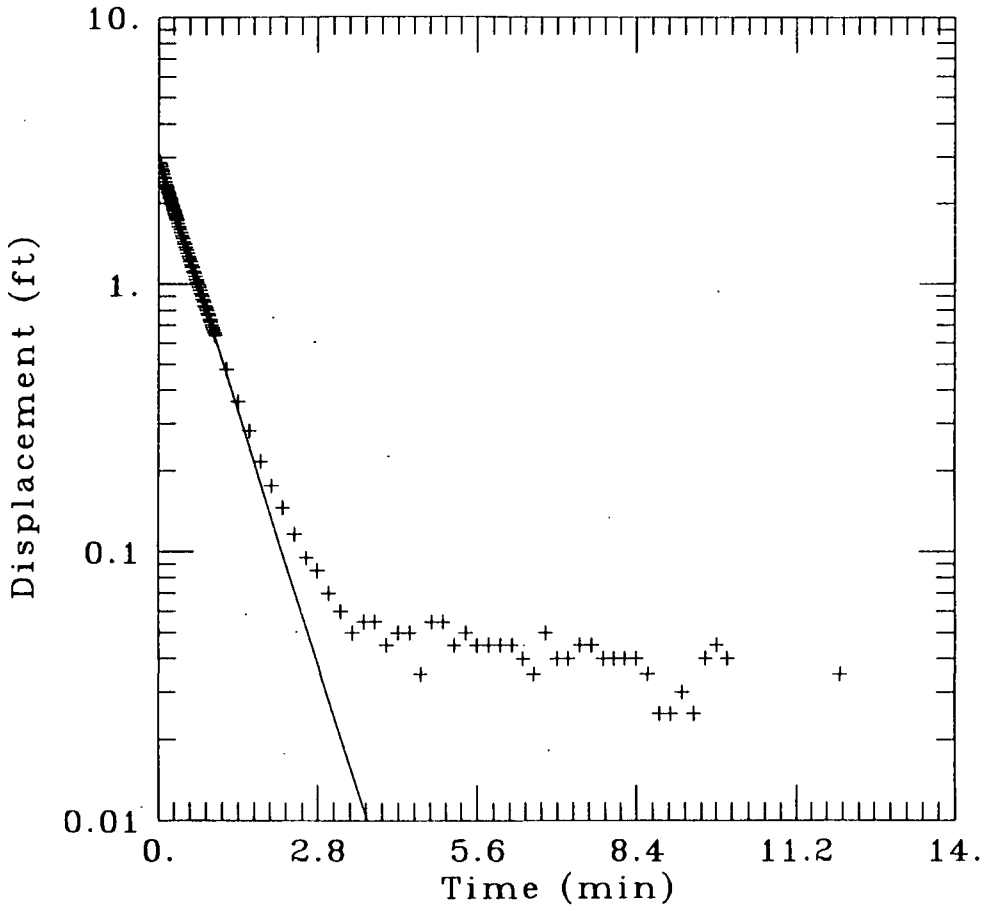
ESTIMATED PARAMETERS:
K = 0.0004709 ft/min
y0 = 0.8489 ft

TEST DATA:
H0 = 0.948 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 10.46 ft
H = 10.46 ft

001160.0074

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-026



DATA SET:
mw-026a.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 May 94

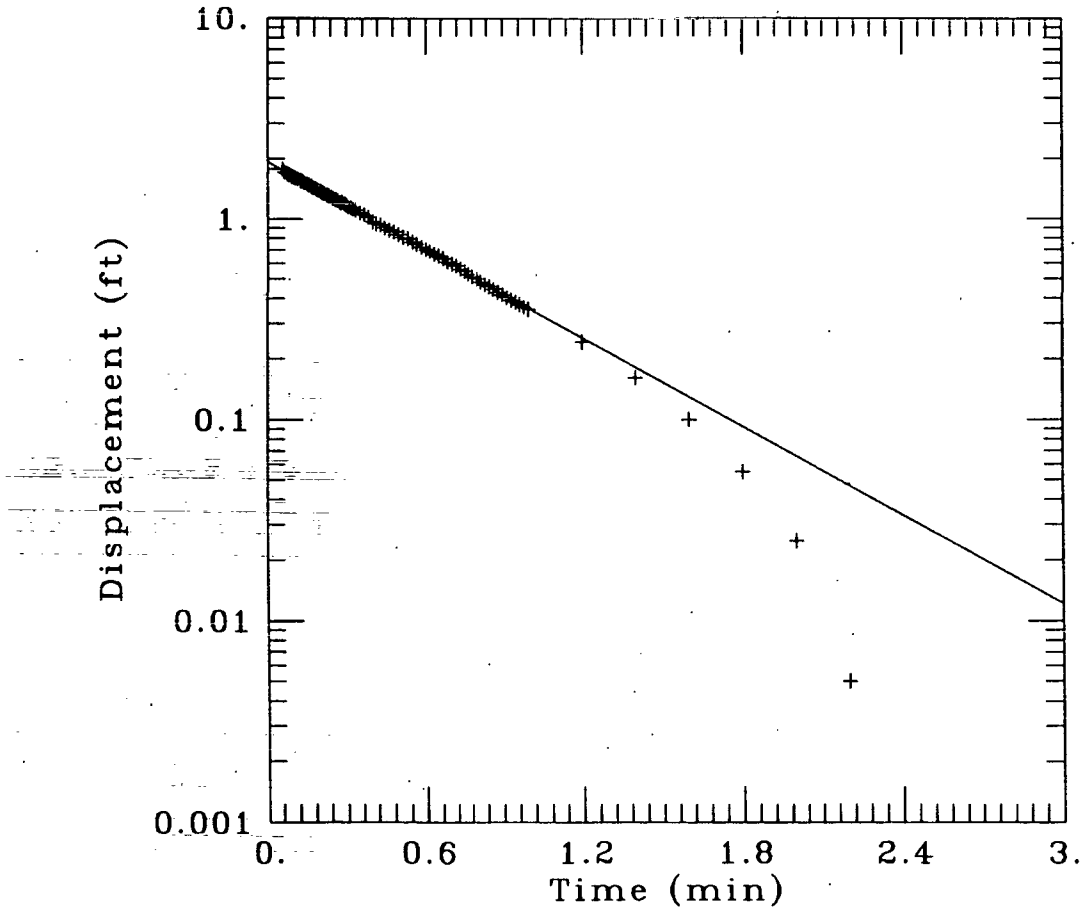
ESTIMATED PARAMETERS:
K = 0.002369 ft/min
y0 = 2.933 ft

TEST DATA:
H0 = 2.866 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10. ft
b = 10. ft
H = 87. ft

001160.0075

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-026I



DATA SET:
mw-026i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 MAY 94

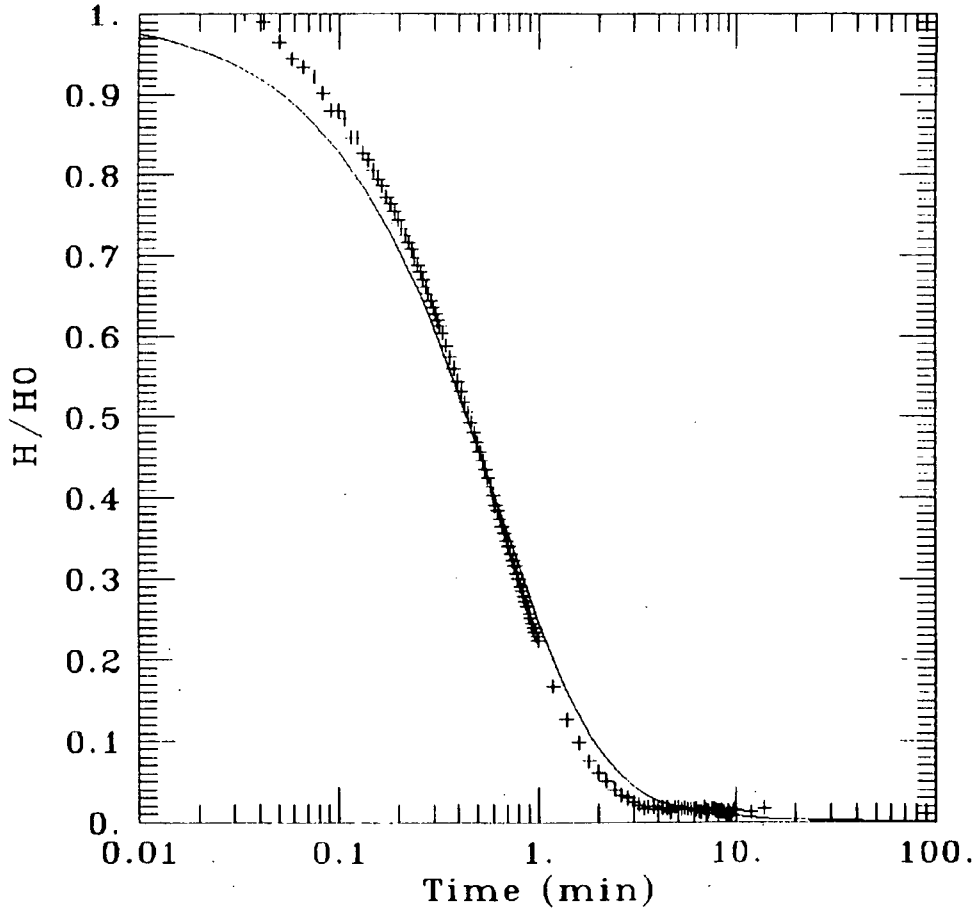
ESTIMATED PARAMETERS:
K = 0.002581 ft/min
y0 = 1.929 ft

TEST DATA:
H0 = 1.771 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 87. ft

001160.0076

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-026



DATA SET:
MW-026A DAT
06/23/94

AQUIFER TYPE:
Confined

SOLUTION METHOD
Cooper et al

TEST DATE
24 May 94

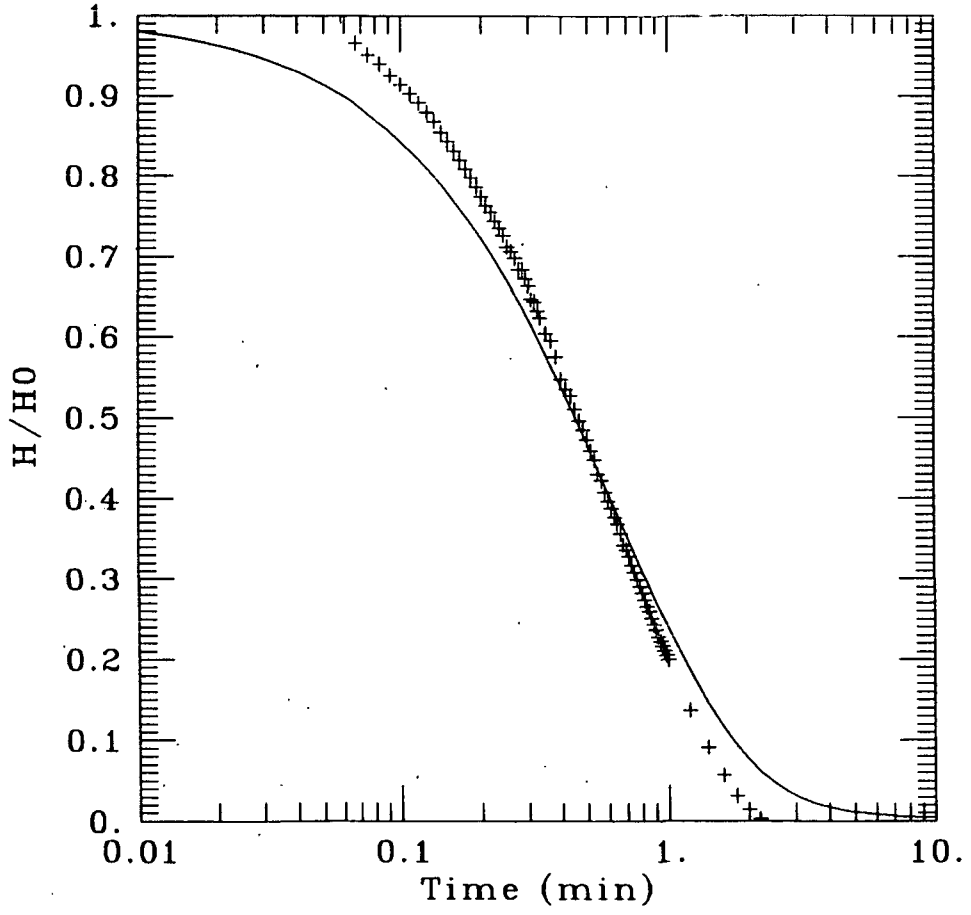
ESTIMATED PARAMETERS:
T = 0.02921 ft^2/min
S = 1.1953E-05

TEST DATA
H0 = 2.866 ft
rc = 0.083 ft
rw = 0.1666 ft

0-86

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-026I



DATA SET:
mw-026i.dat
07/11/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
24 MAY 94

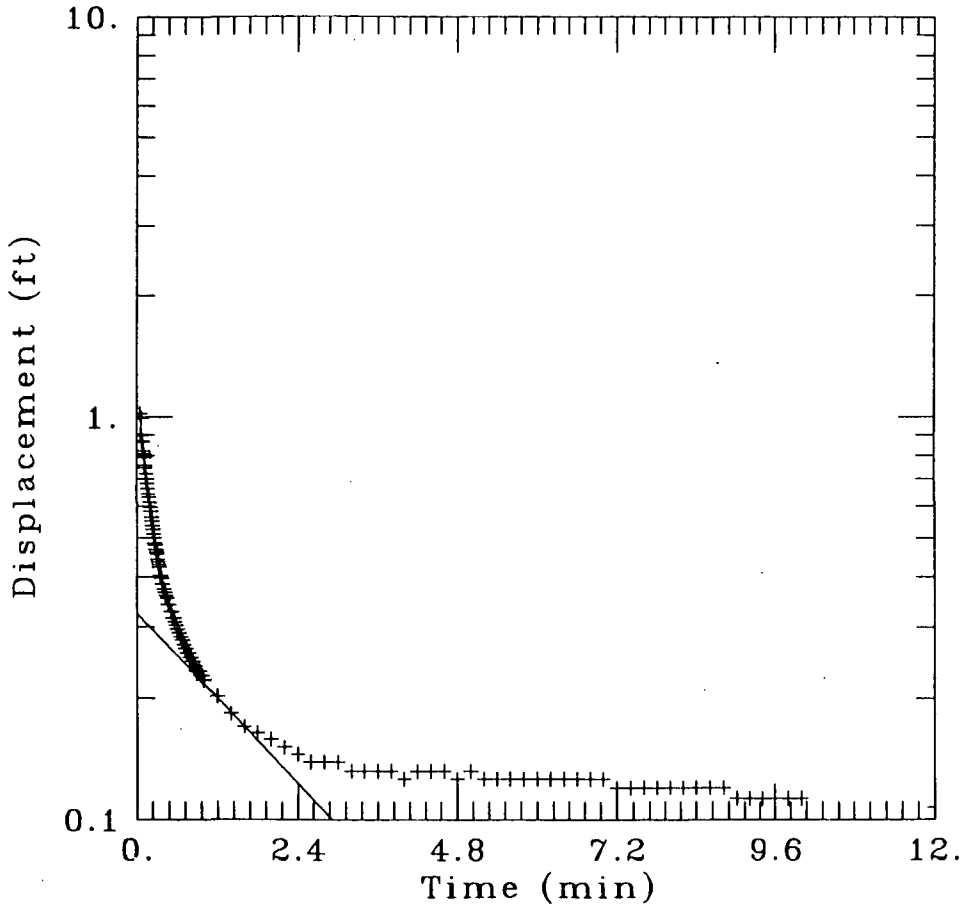
ESTIMATED PARAMETERS:
T = 0.0489 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.771 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0078

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-027



DATA SET:
mw-027a.dat
07/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 May 94

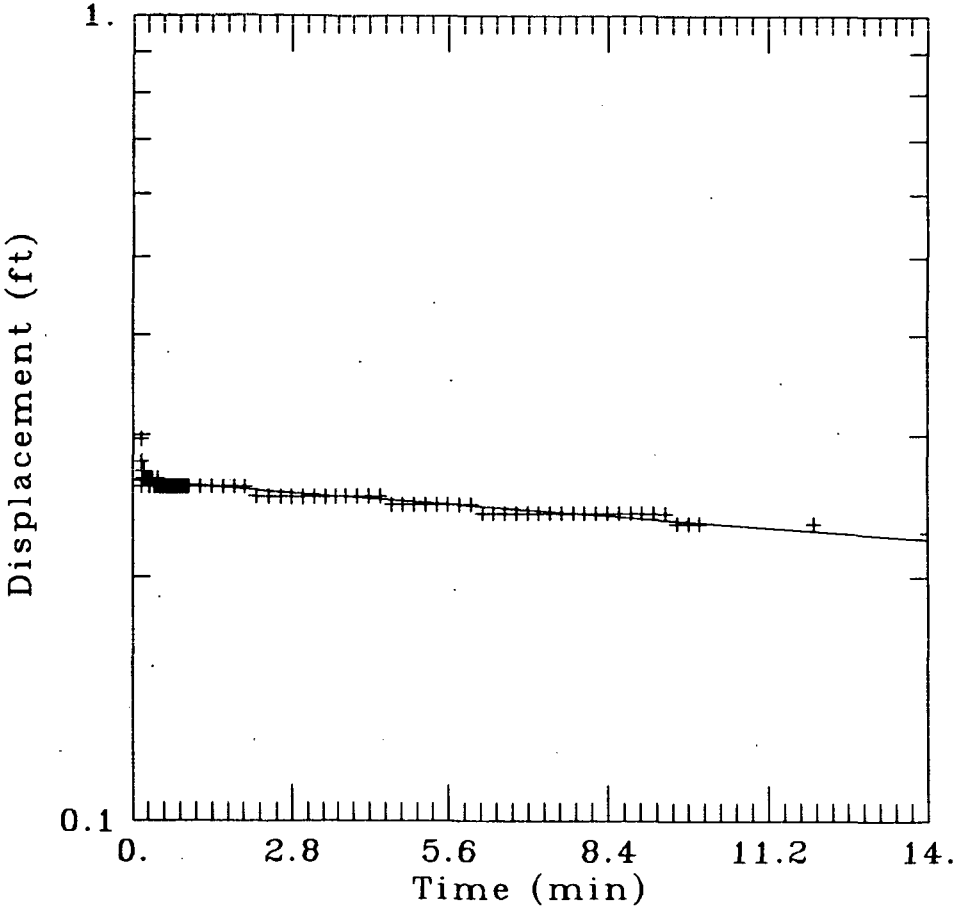
ESTIMATED PARAMETERS:
K = 0.001898 ft/min
y0 = 0.3243 ft

TEST DATA:
H0 = 1.017 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.01 ft
H = 9.01 ft

001160.0079

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-027I



DATA SET:
mw-027i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 MAY 94

ESTIMATED PARAMETERS:
K = 5.6589E-05 ft/min
y0 = 0.2635 ft

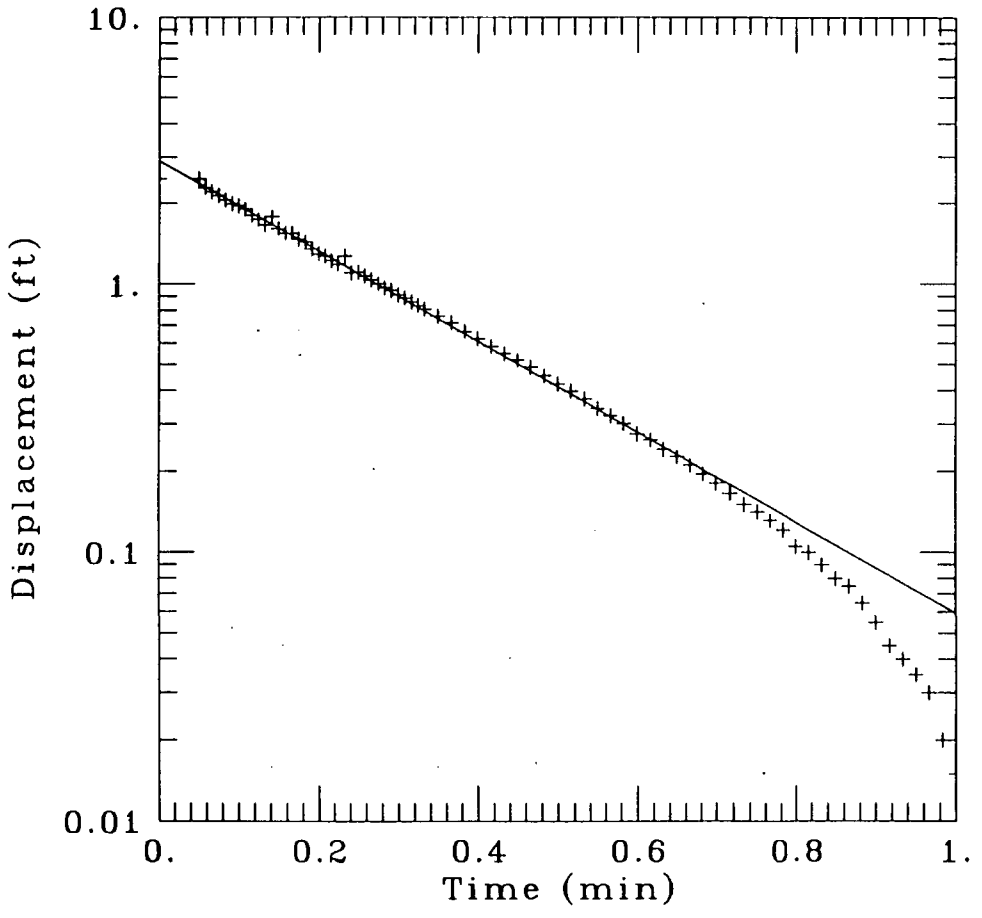
TEST DATA:
H0 = 0.297 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.01 ft
H = 9.01 ft

68-0

001160.0080

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-028



DATA SET:
mw-028a.dat
07/19/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 May 94

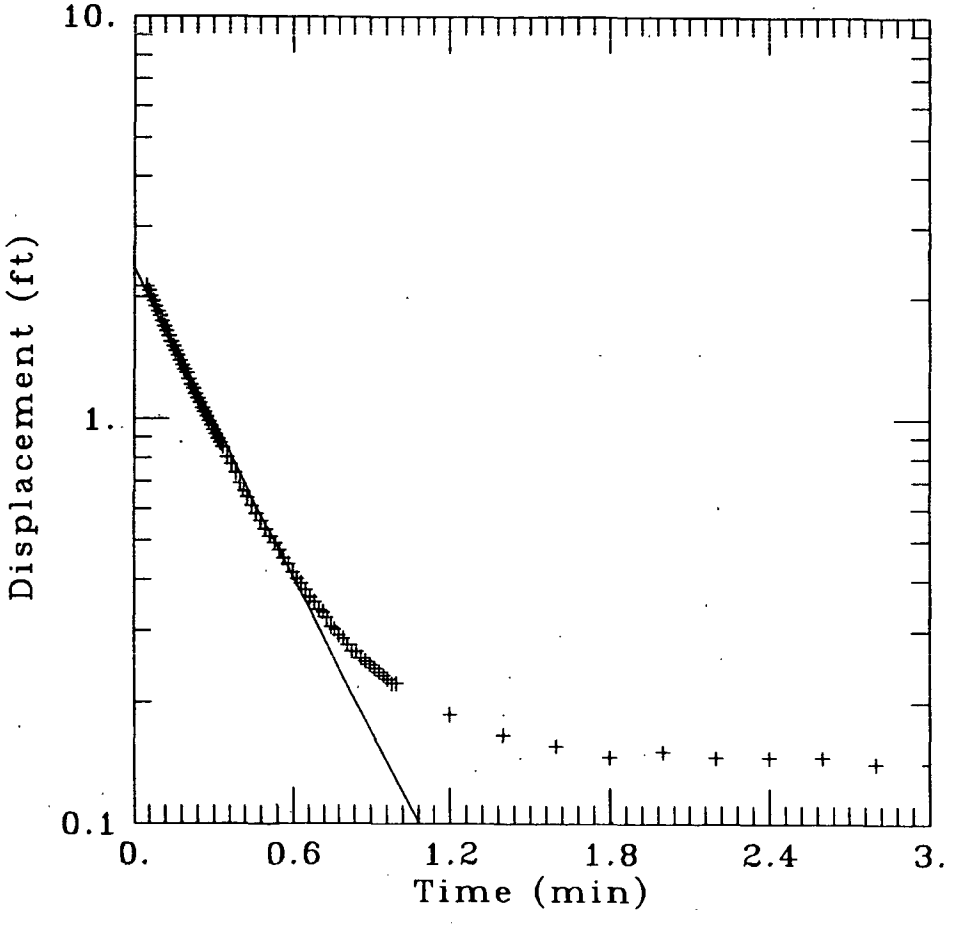
ESTIMATED PARAMETERS:
K = 0.005812 ft/min
y0 = 2.895 ft

TEST DATA:
H0 = 2.478 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10. ft
b = 10. ft
H = 74. ft

001160.0081

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-028I



DATA SET:
mw-028i.dat
07/19/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
24 MAY 94

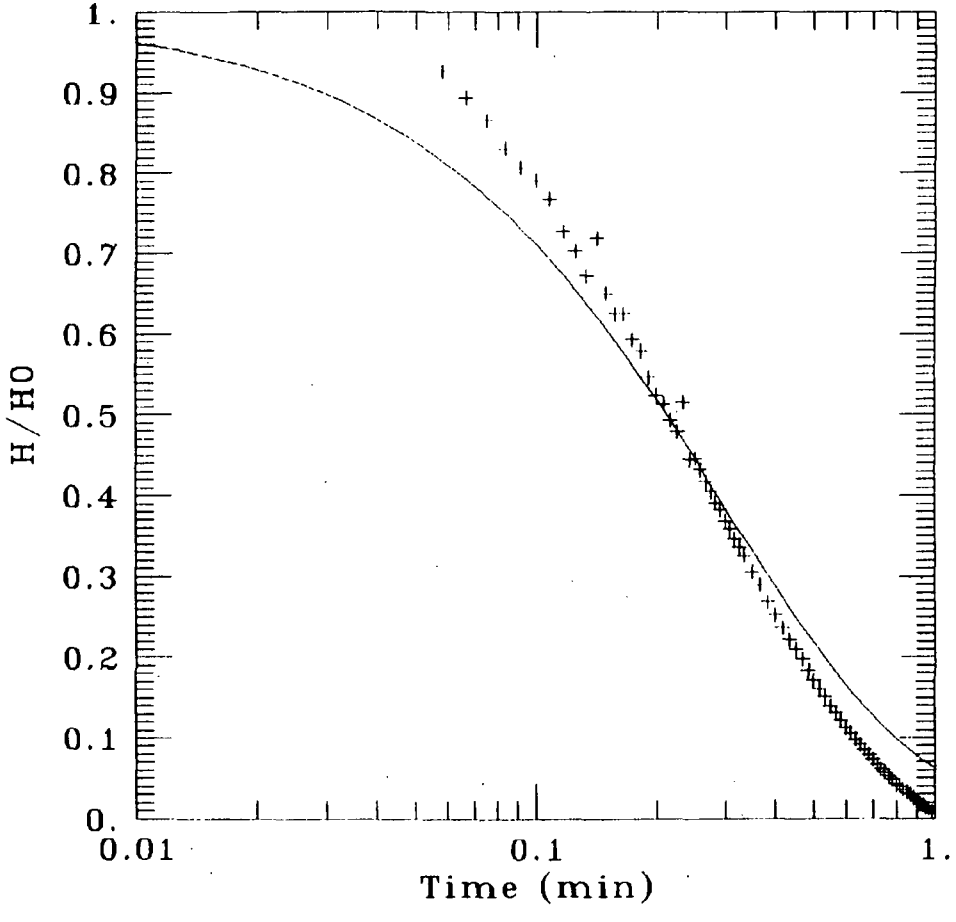
ESTIMATED PARAMETERS:
K = 0.004375 ft/min
y0 = 2.365 ft

TEST DATA:
H0 = 2.135 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 74. ft

001160.0082

Ecology & Environment, Inc.	Client USEPA
	Location: Agricultural Street Landfill

MW-028



DATA SET:
MW 028A DAT
06/23/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE
24 May 94

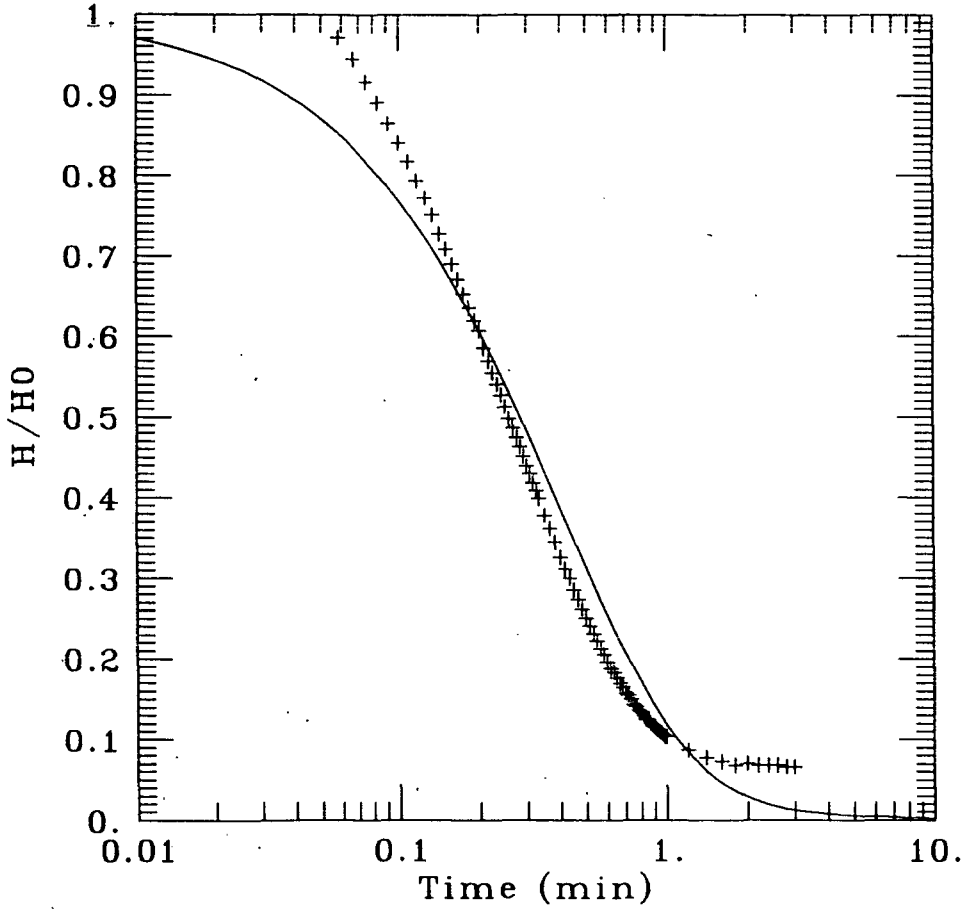
ESTIMATED PARAMETERS:
T = 0.125 ft^2/min
S = 2.7923E-10

TEST DATA
HO = 2.478 ft
rc = 0.083 ft
rw = 0.1666 ft

001160.0083

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-028I



DATA SET:
mw-028i.dat
07/19/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
24 MAY 94

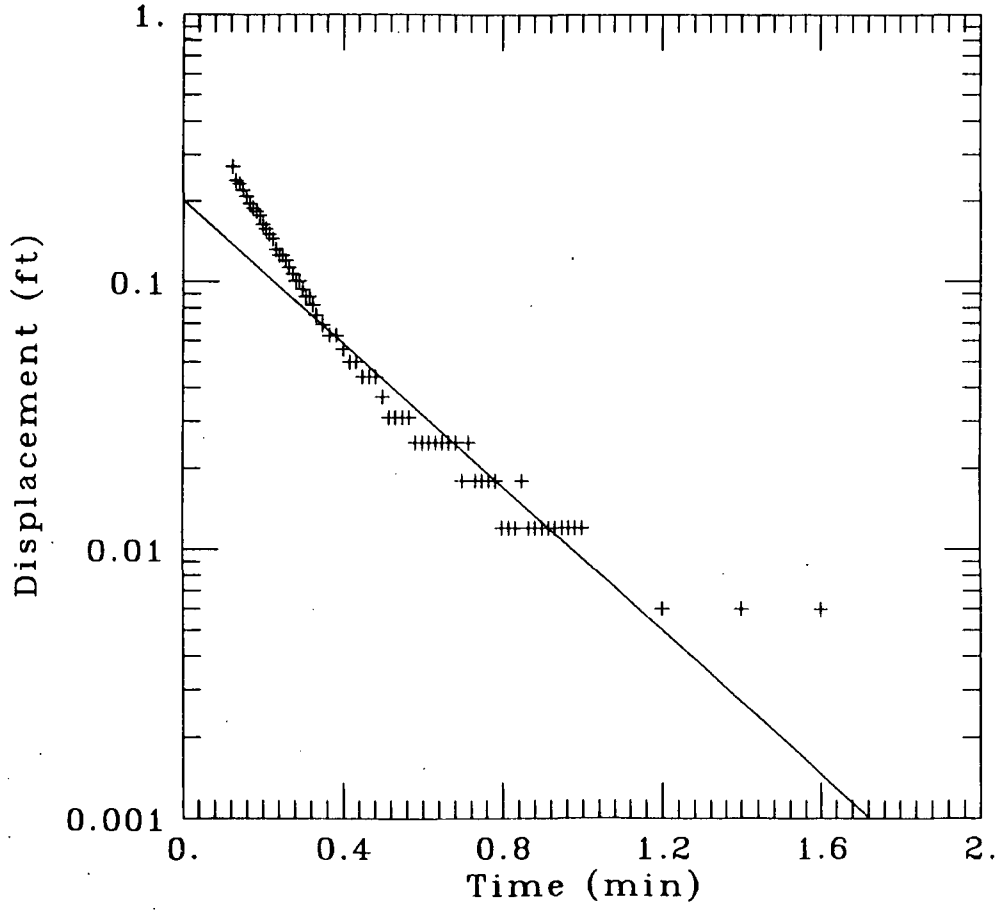
ESTIMATED PARAMETERS:
T = 0.07645 ft^2/min
S = 1.2697E-08

TEST DATA:
H0 = 2.135 ft
rc = 0.083 ft
rw = 0.166 ft

001160.0084

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-029



DATA SET:
mw-029a.dat
07/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
K = 0.01454 ft/min
y0 = 0.2017 ft

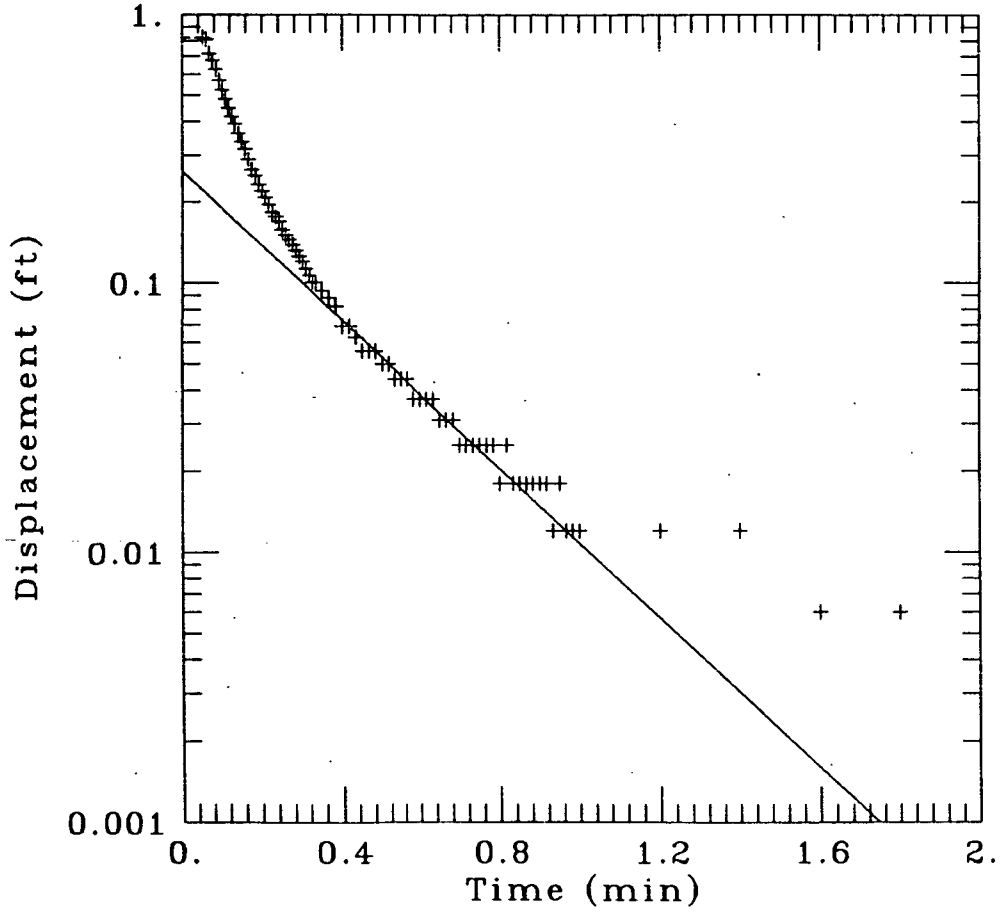
TEST DATA:
H0 = 0.809 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.09 ft
H = 9.09 ft

0-94

001160.0085

Ecology and Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-029I



DATA SET:
MW-030.DAT
07/25/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

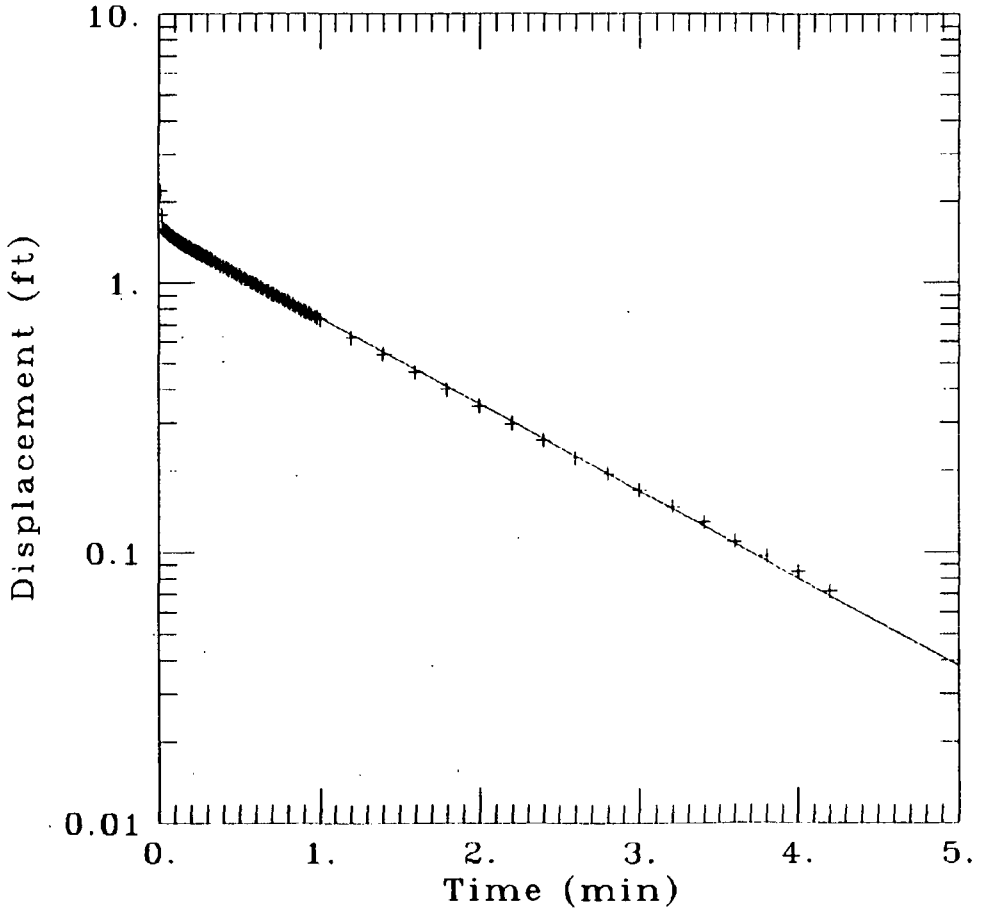
ESTIMATED PARAMETERS:
K = 0.01535 ft/min
y0 = 0.2602 ft

TEST DATA:
H0 = 0.821 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 9.9 ft
H = 9.9 ft

001160.0086

Ecology & Environment, Inc.	Client USEPA
	Location: Agricultural Street Landfil

MW-030



DATA SET:
MW-030A.DAT
06/24/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 May 94

ESTIMATED PARAMETERS:
K = 0.001103 ft/min
y0 = 1.558 ft

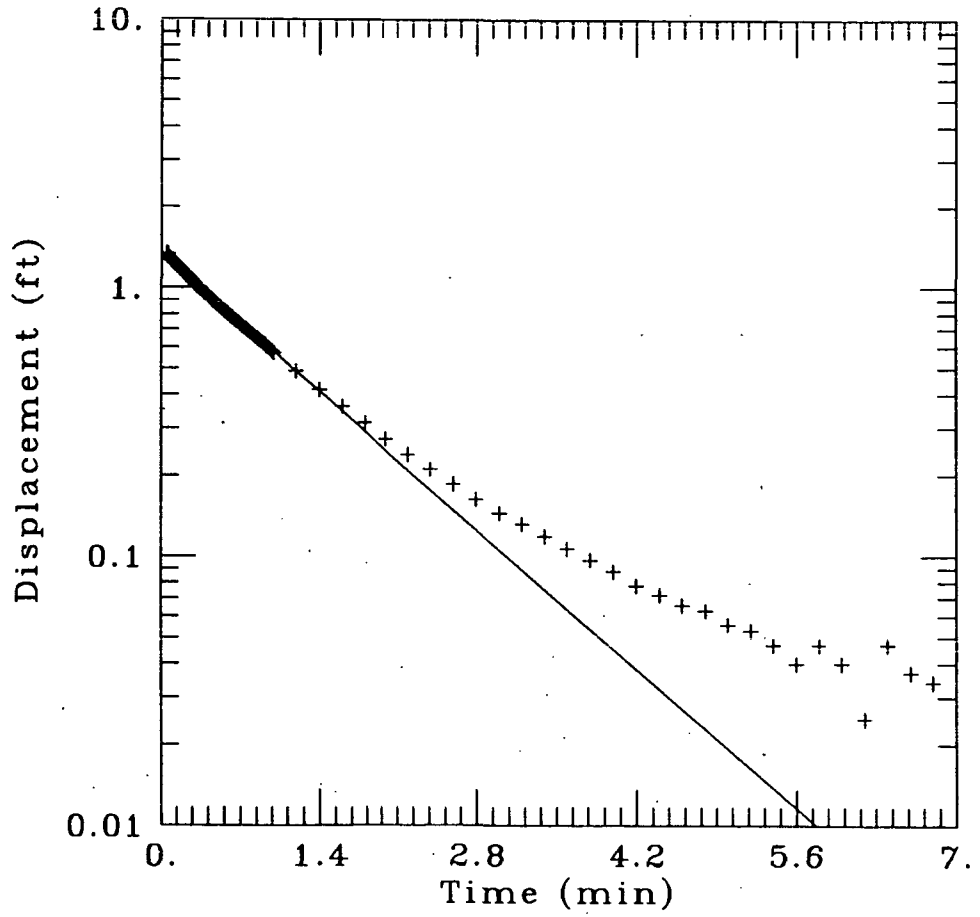
TEST DATA:
H0 = 2.188 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10 ft
b = 10. ft
H = 70.88 ft

96-0

001160.0087

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-030I



DATA SET:
mw-030i.dat
06/21/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 MAY 94

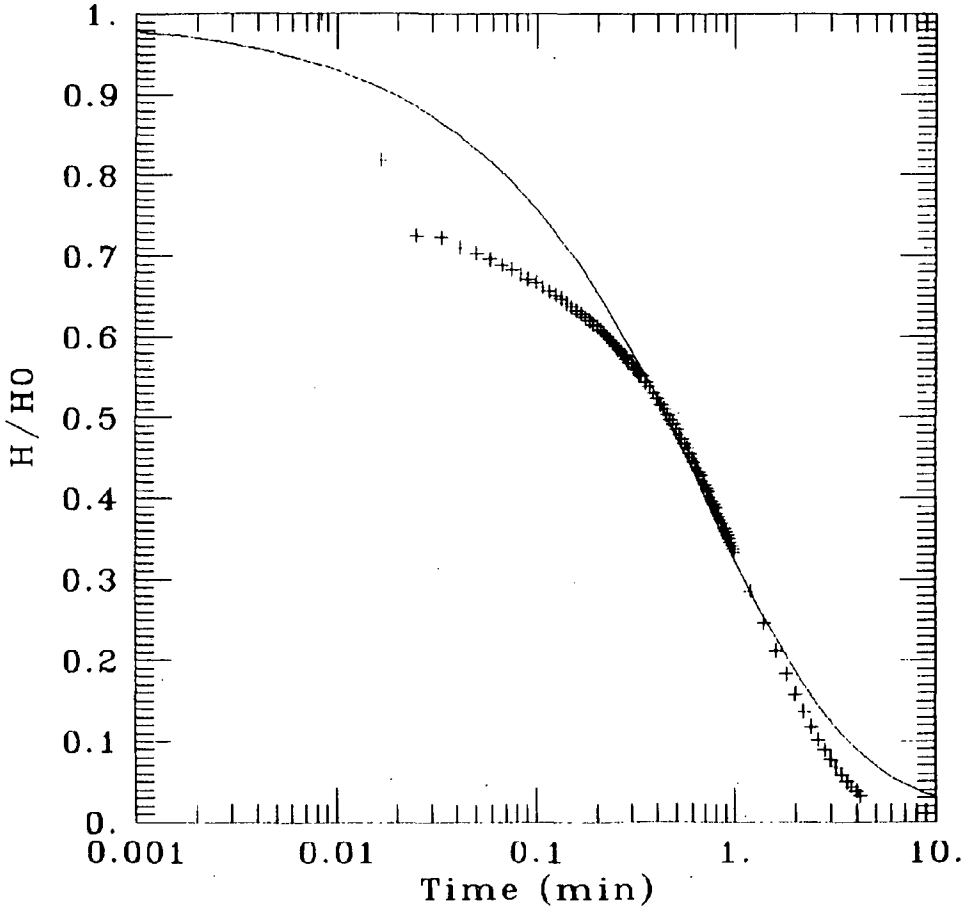
ESTIMATED PARAMETERS:
K = 0.001234 ft/min
y0 = 1.349 ft

TEST DATA:
H0 = 1.343 ft
rc = 0.082 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 70.88 ft

001160.0088

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-030



DATA SET:
MW-030A DAT
06/29/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al
TEST DATE:
25 May 94

ESTIMATED PARAMETERS:
T = 0 006828 ft^2/min
S = 0 02142

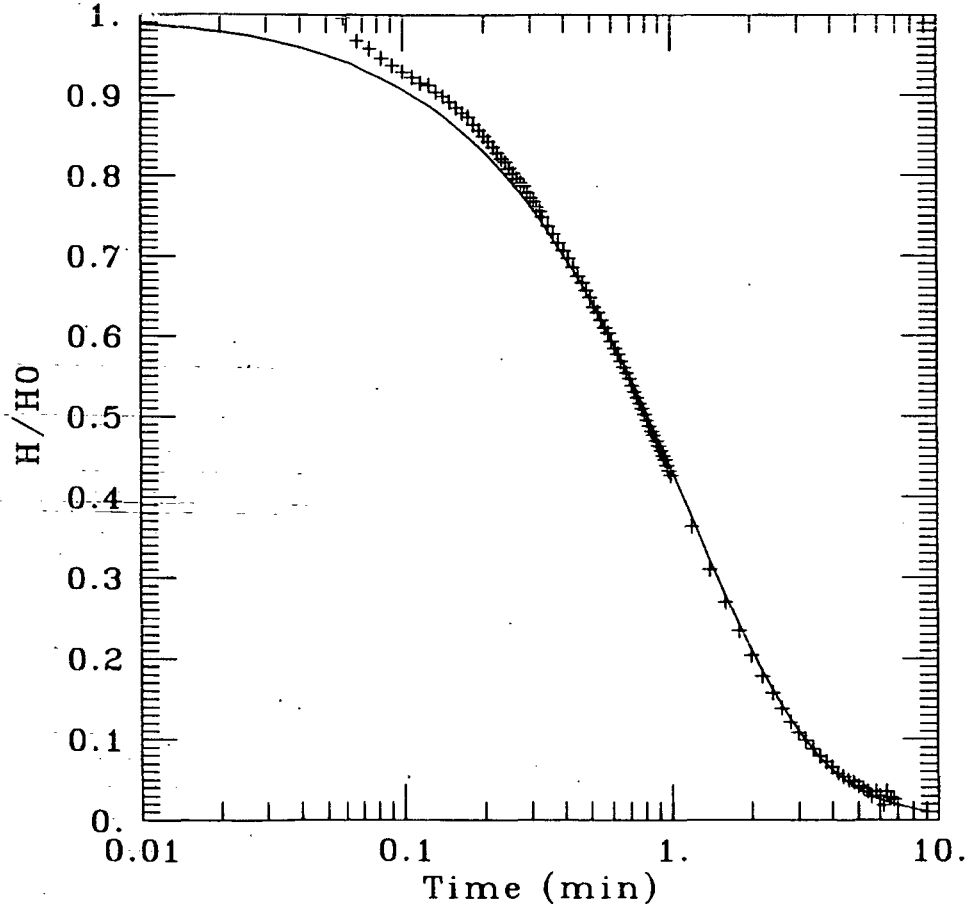
TEST DATA:
H0 = 2 188 ft
rc = 0 083 ft
rw = 0 1666 ft

86-98

001160.0089

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-030I



DATA SET:
mw-030i.dat
07/11/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
25 MAY 94

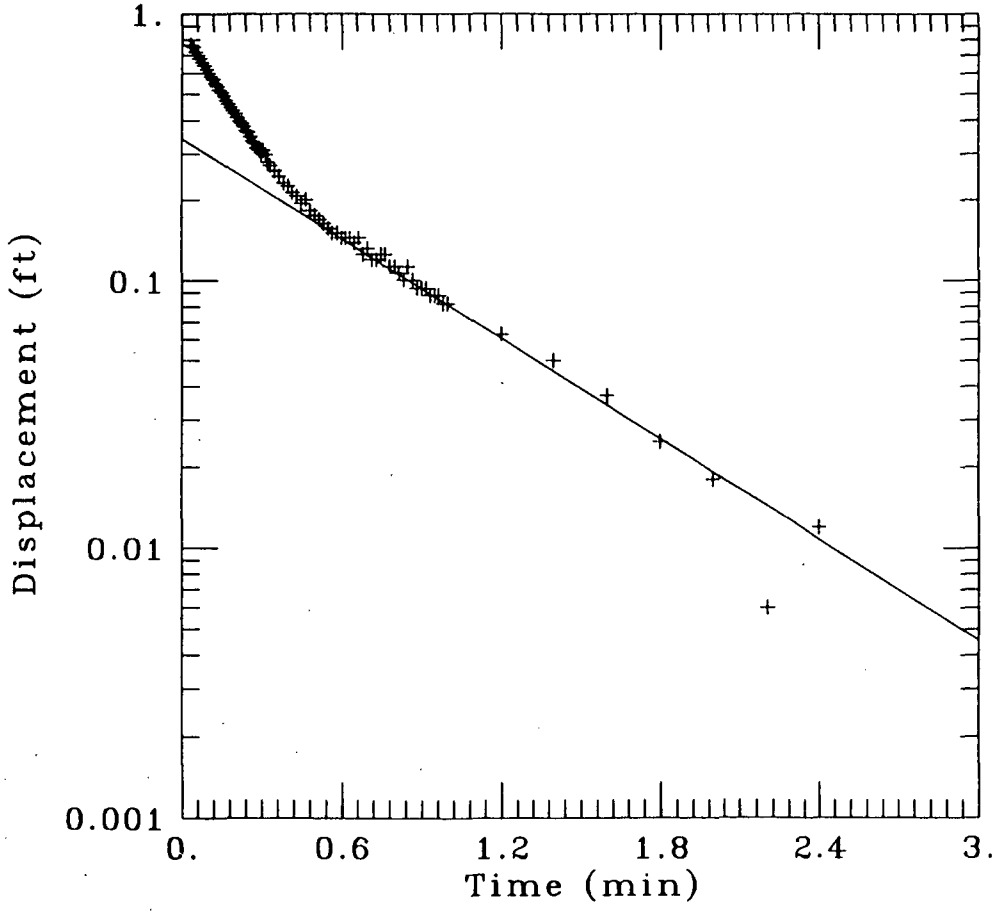
ESTIMATED PARAMETERS:
T = 0.0262 ft^2/min
S = 1.E-08

TEST DATA:
HO = 1.343 ft
rc = 0.082 ft
rw = 0.166 ft

66-0

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-031



DATA SET:
mw-031a.dat
07/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 May 94

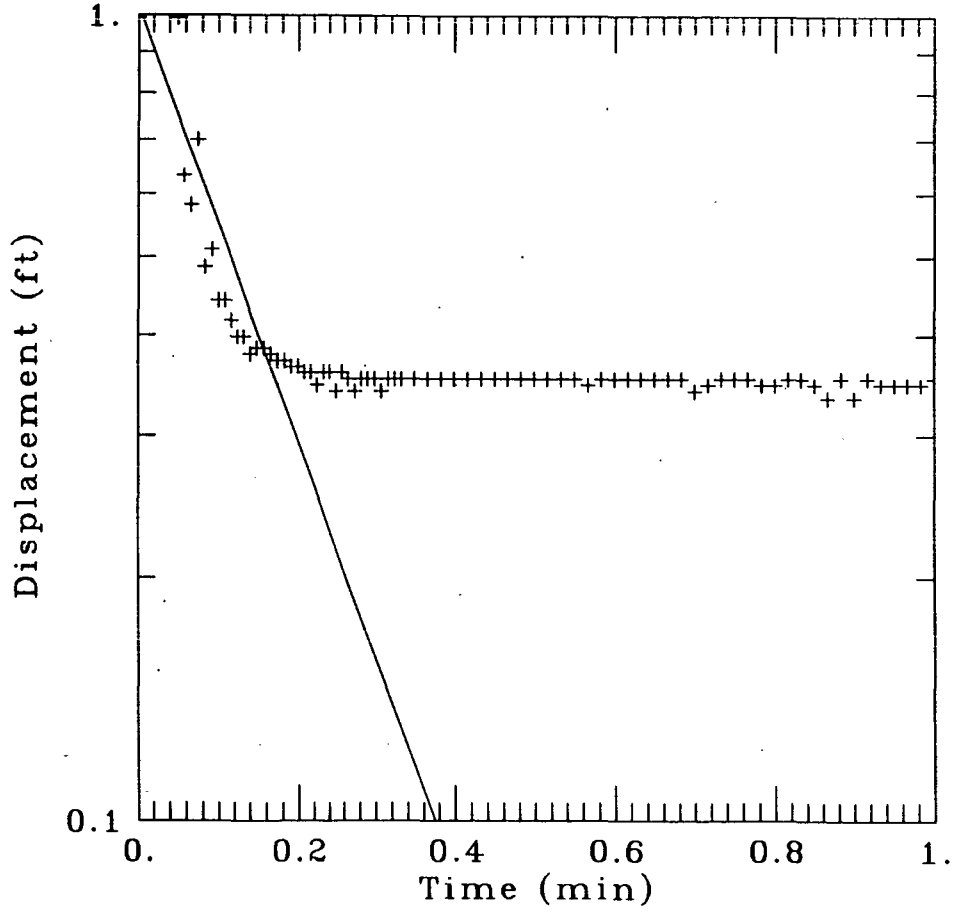
ESTIMATED PARAMETERS:
K = 0.006466 ft/min
y0 = 0.3419 ft

TEST DATA:
H0 = 0.764 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 7.5 ft
H = 7.5 ft

001160.0091

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-031I



DATA SET:
mw-031i.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

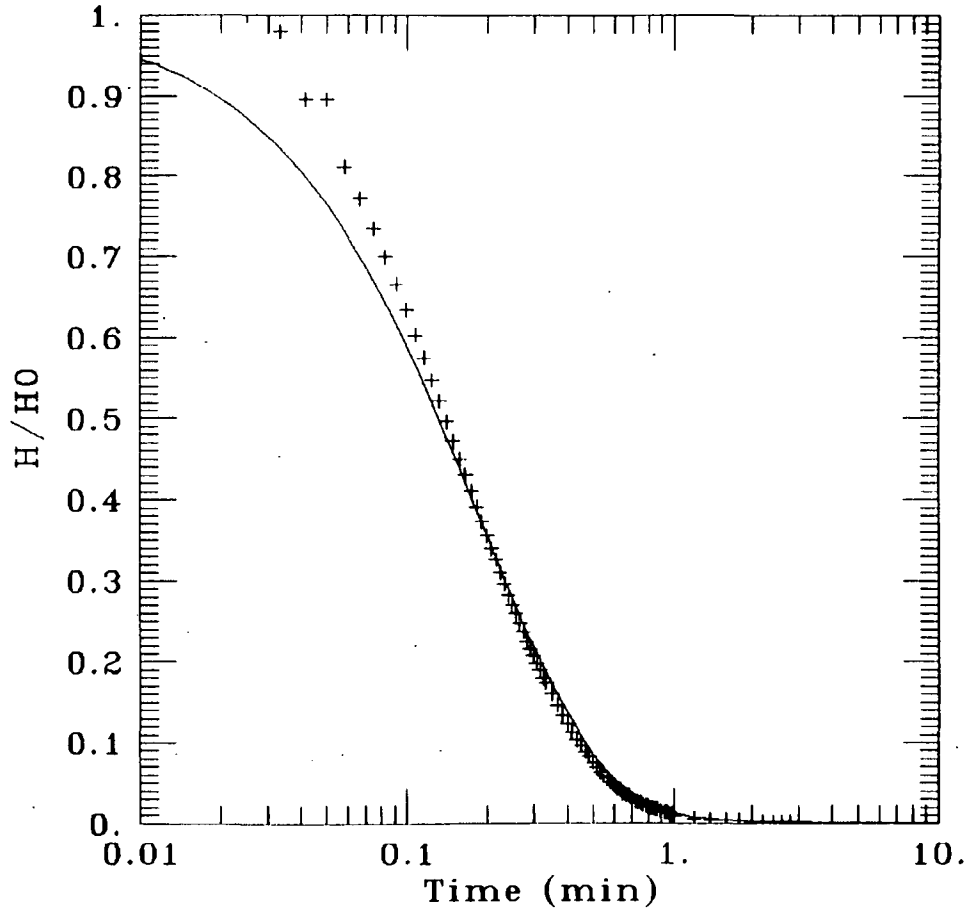
ESTIMATED PARAMETERS:
K = 0.02791 ft/min
y0 = 1.027 ft

TEST DATA:
H0 = 0.992 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 7.5 ft
H = 7.5 ft

001160.0092

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-032



DATA SET:
MW-032A DAT
06/24/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al

TEST DATE:
25 May 94

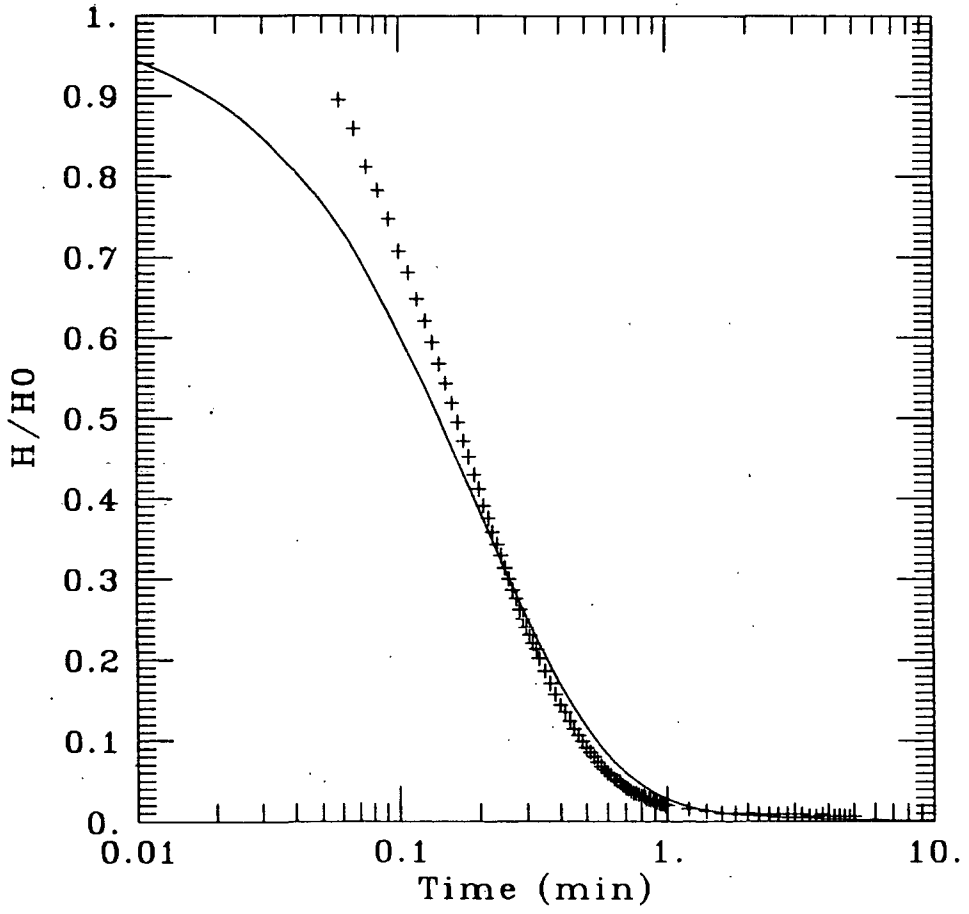
ESTIMATED PARAMETERS:
T = 0.4259 ft^2/min
S = 7.5738E-21

TEST DATA:
HO = 1.595 ft
rc = 0.083 ft
rw = 0.1666 ft

0-102

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-032I



DATA SET:
mw-032i.dat
07/11/94

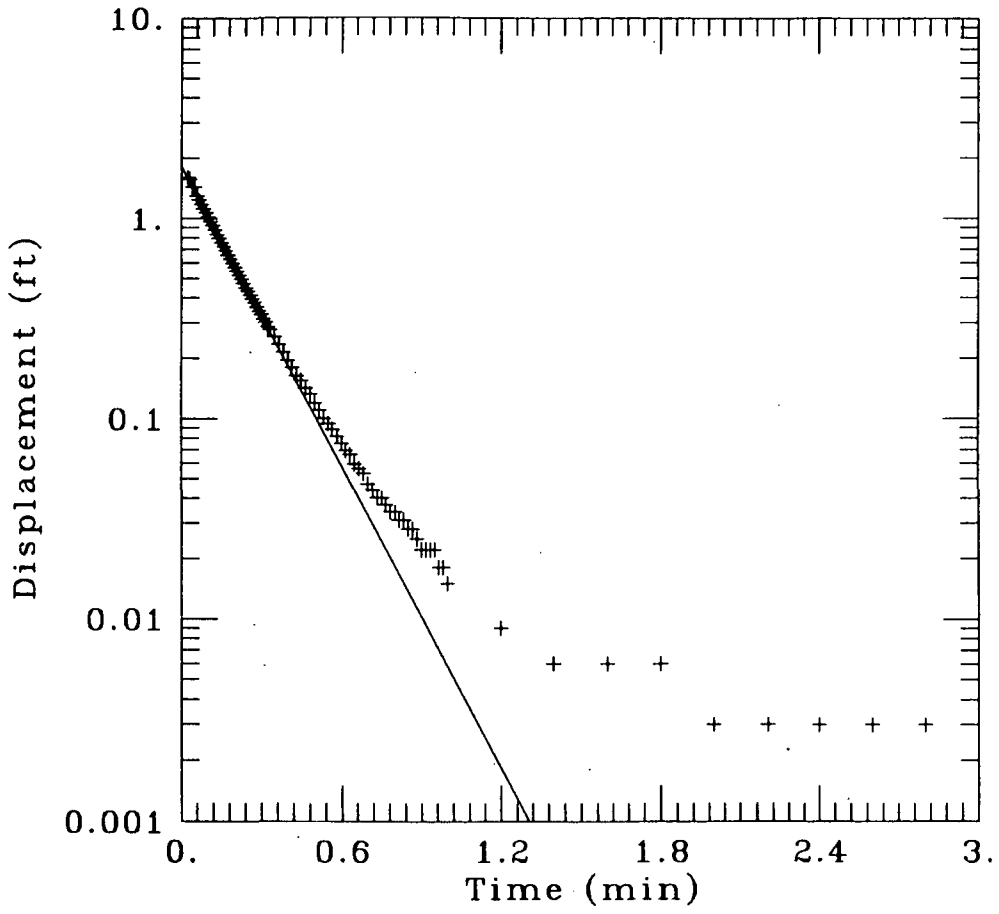
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
T = 0.1559 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.415 ft
rc = 0.083 ft
rw = 0.166 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-032



DATA SET:
mw-032a.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 May 94

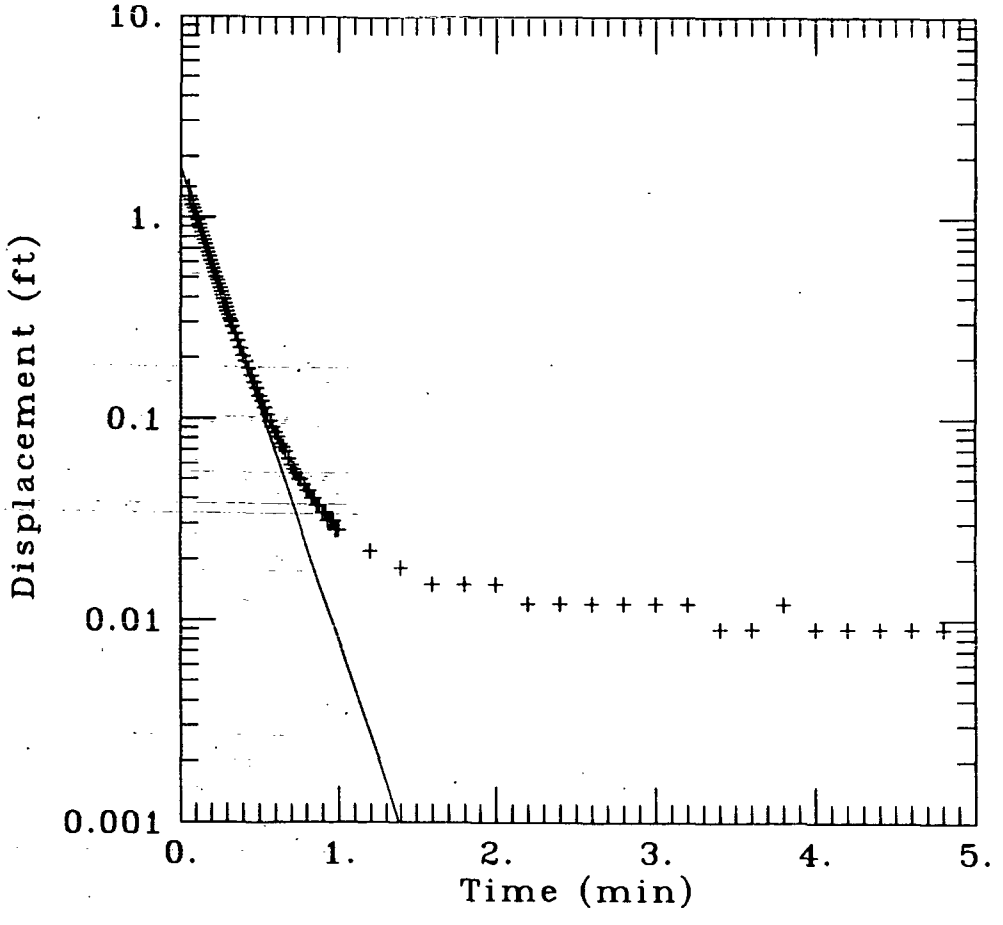
ESTIMATED PARAMETERS:
K = 0.008451 ft/min
y0 = 1.823 ft

TEST DATA:
H0 = 1.595 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10. ft
b = 10. ft
H = 64.89 ft

001160.0095

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-032I



DATA SET:
MW-032I.DAT
06/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

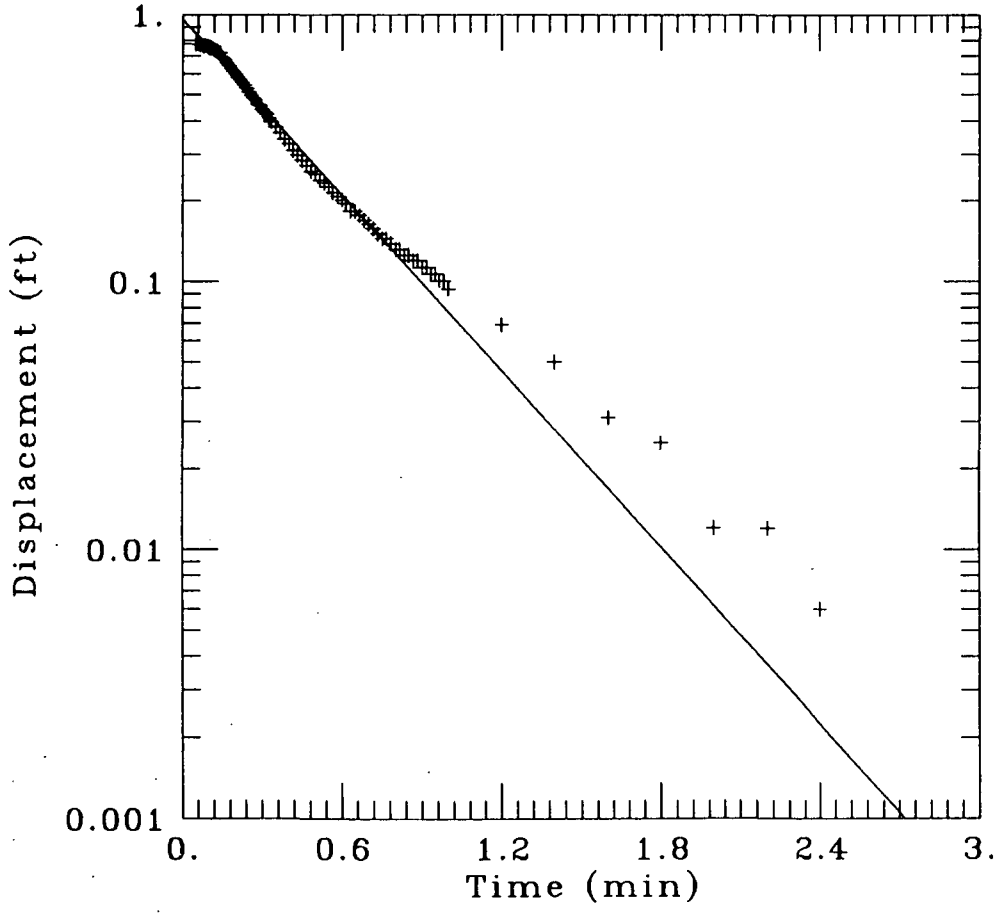
ESTIMATED PARAMETERS:
K = 0.007936 ft/min
y0 = 1.74 ft

TEST DATA:
H0 = 1.415 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 64.89 ft

001160.0096

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-033



DATA SET:
mw-033a.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 May 94

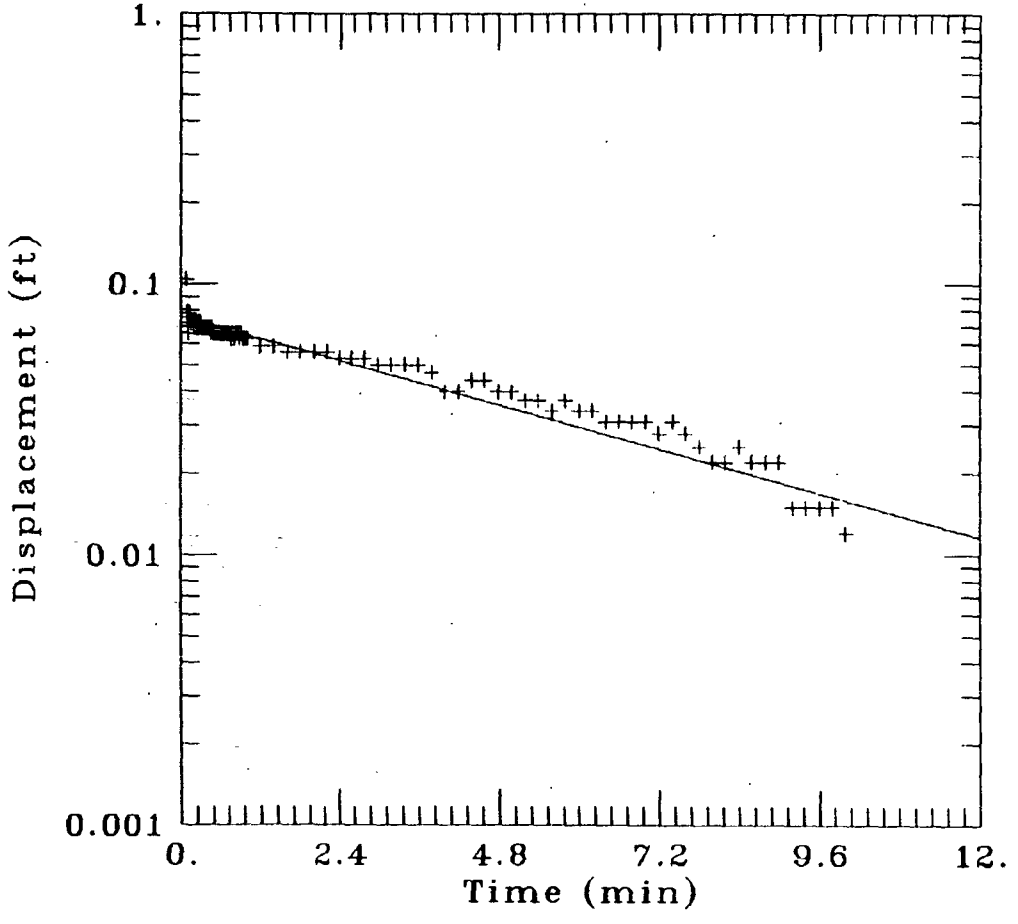
ESTIMATED PARAMETERS:
K = 0.002316 ft/min
y0 = 0.959 ft

TEST DATA:
H0 = 0.778 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.45 ft
H = 11.45 ft

001160.0097

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-034



DATA SET:
MW-034A DAT
06/24/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 May 94

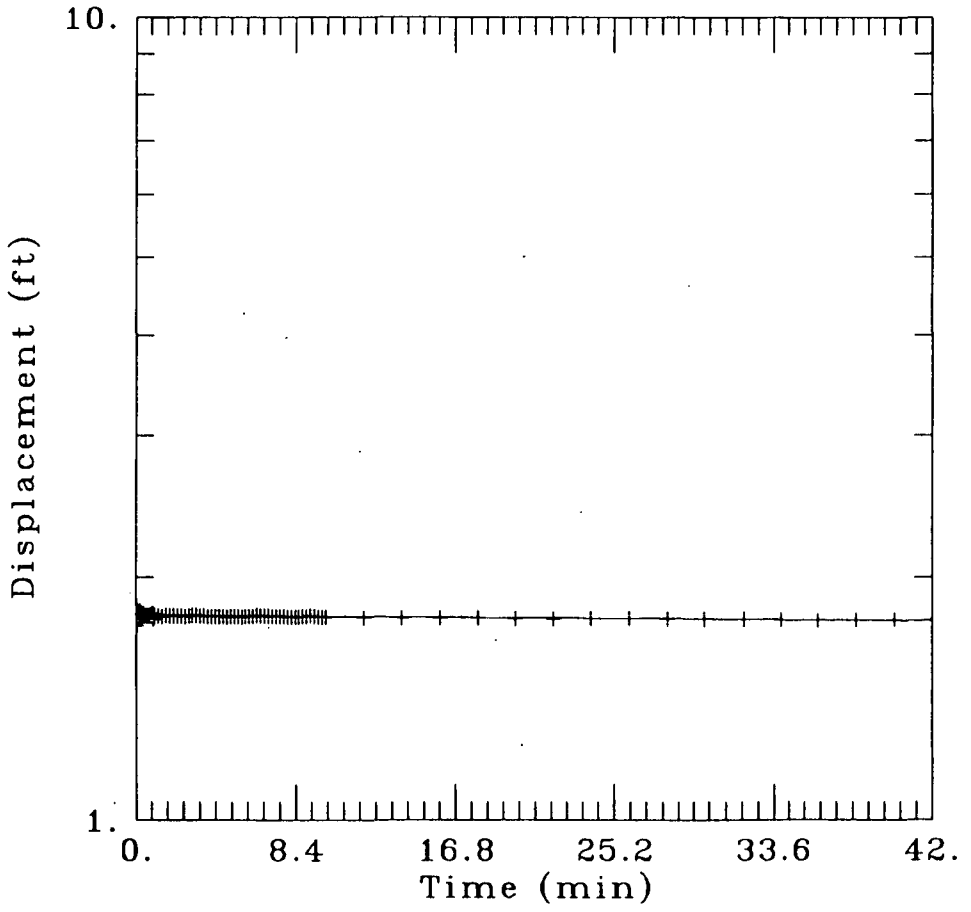
ESTIMATED PARAMETERS:
K = 0.0002325 ft/min
y0 = 0.07567 ft

TEST DATA:
H0 = 0.104 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10 ft
b = 10. ft
H = 70.4 ft

001160.0098

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-034I



DATA SET:
mw-034i.dat
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 MAY 94

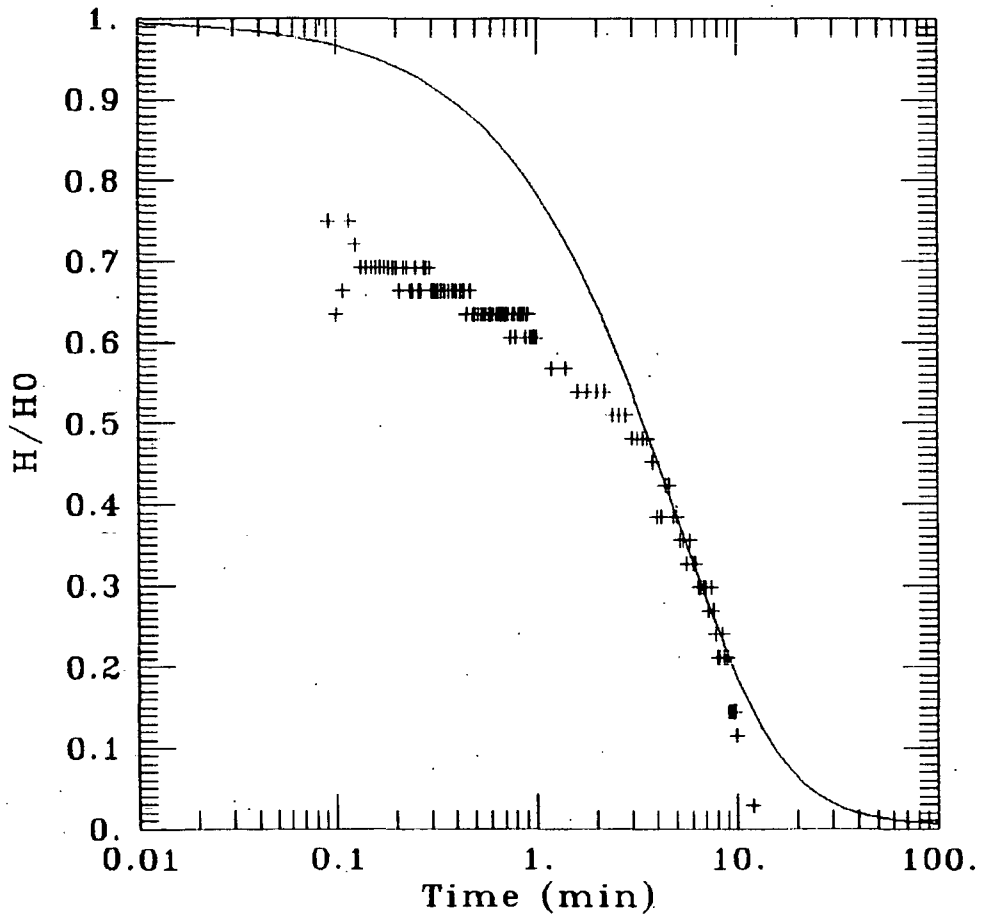
ESTIMATED PARAMETERS:
K = 5.082E-07 ft/min
y0 = 1.792 ft

TEST DATA:
H0 = 1.841 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 70.4 ft

001160.0099

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-034



DATA SET:
MW-034A DAT
06/24/94

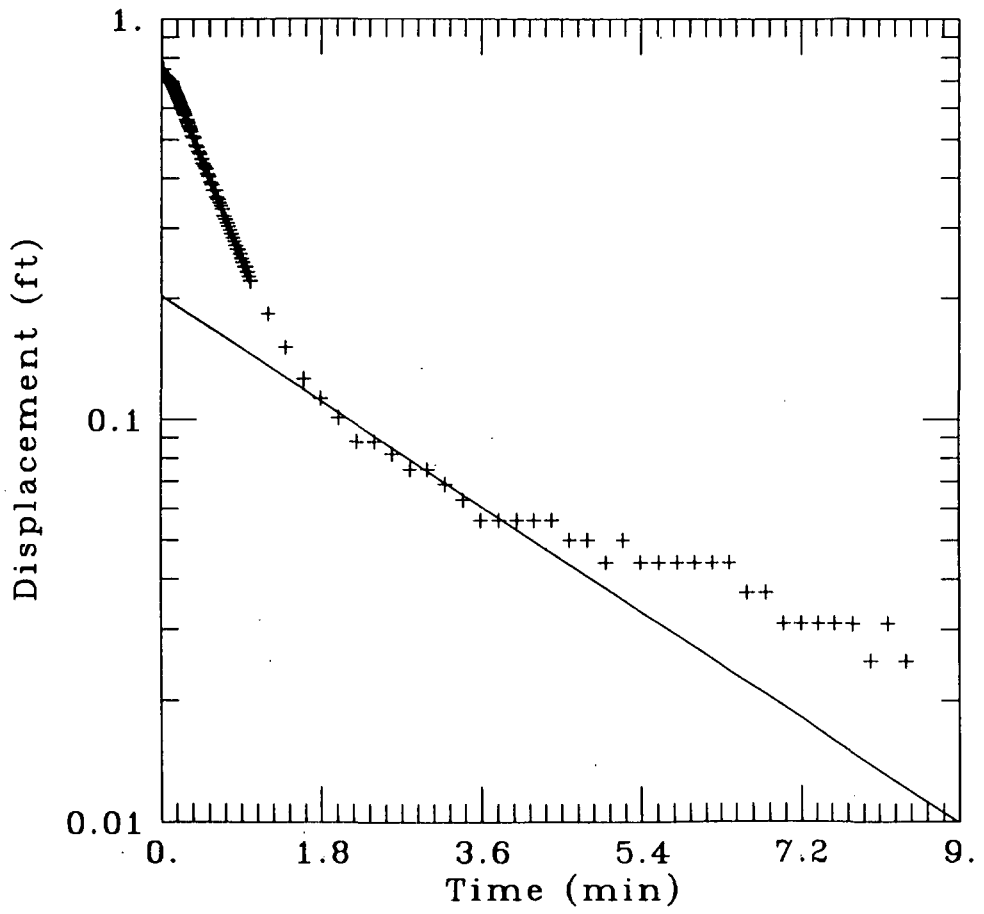
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al
TEST DATE:
25 May 94

ESTIMATED PARAMETERS:
T = 0.003284 ft^2/min
S = 4.5182E-05

TEST DATA:
HO = 0.104 ft
rc = 0.083 ft
rw = 0.1666 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-036



DATA SET:
mw-036ar.dat
07/29/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 may 94

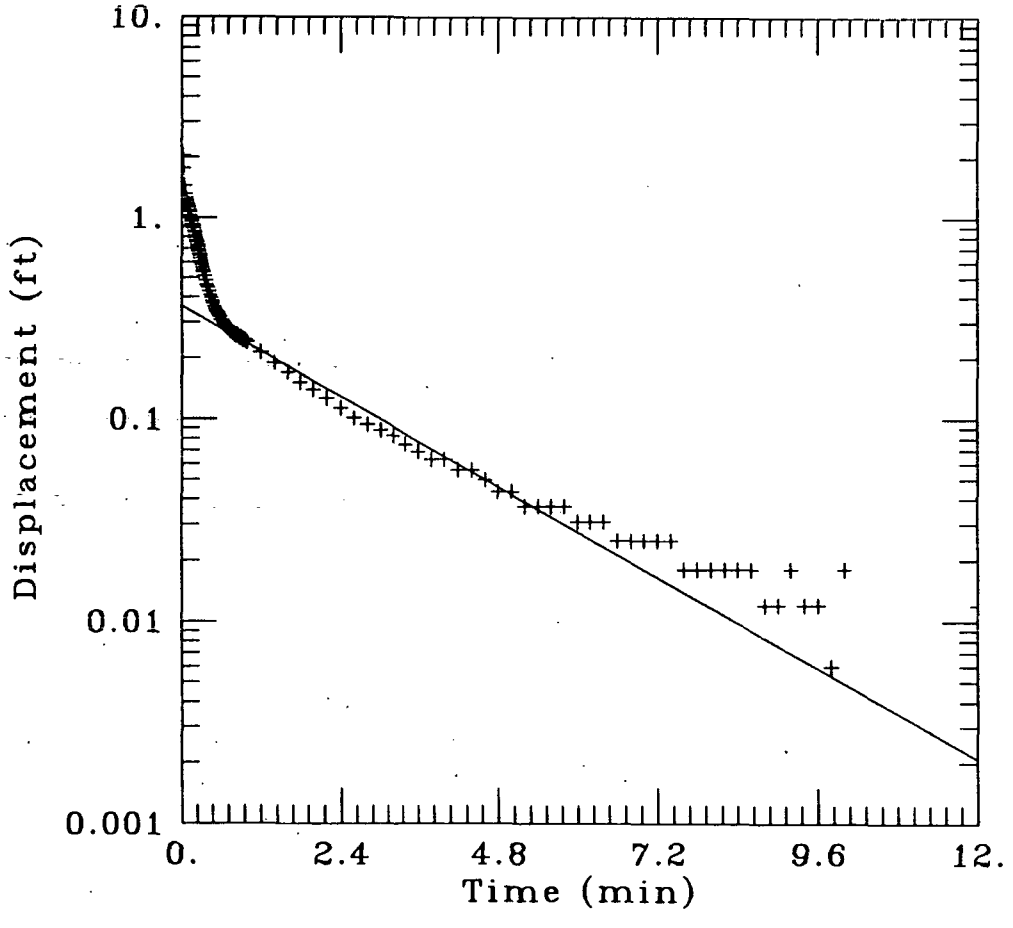
ESTIMATED PARAMETERS:
K = 0.001511 ft/min
y0 = 0.203 ft

TEST DATA:
H0 = 0.752 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 7.6 ft
H = 7.6 ft

001160.0101

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-038



DATA SET:
mw-038a.dat
07/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

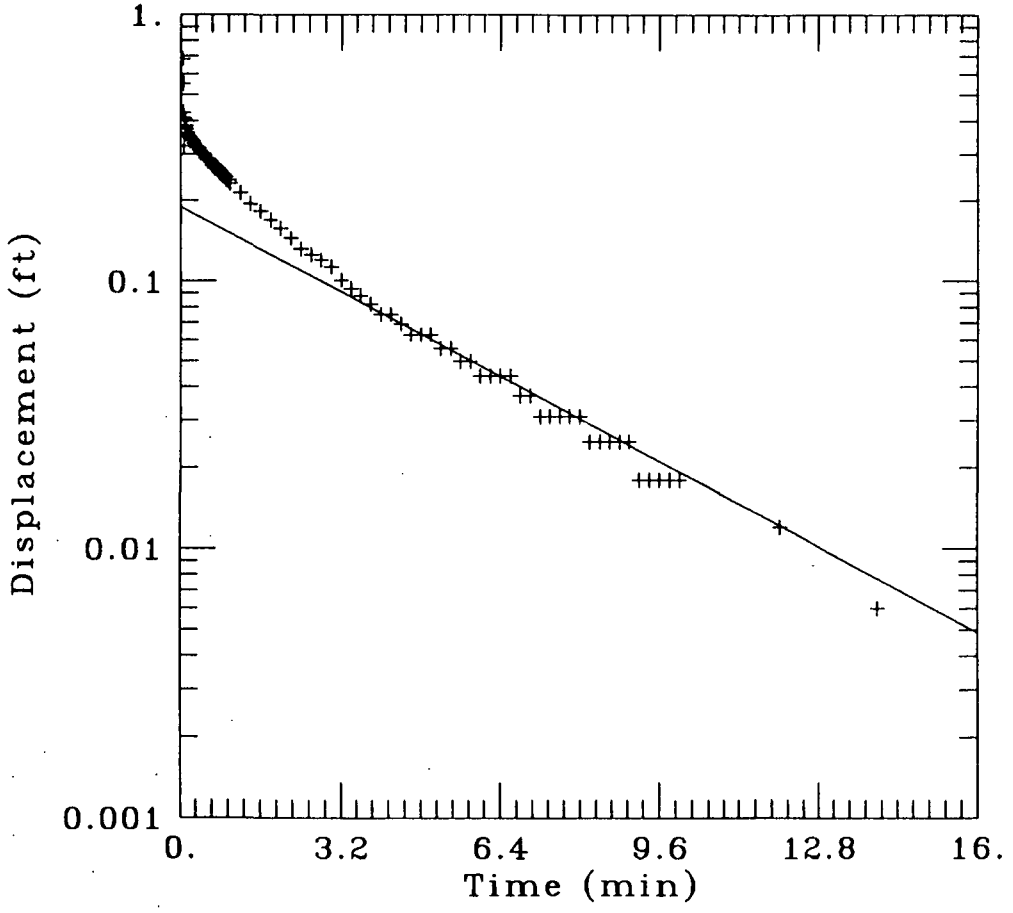
ESTIMATED PARAMETERS:
K = 0.001953 ft/min
y0 = 0.3631 ft

TEST DATA:
H0 = 2.041 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 7.84 ft
H = 7.84 ft

001160.0102

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-038I



DATA SET:
mw-038i.dat
07/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

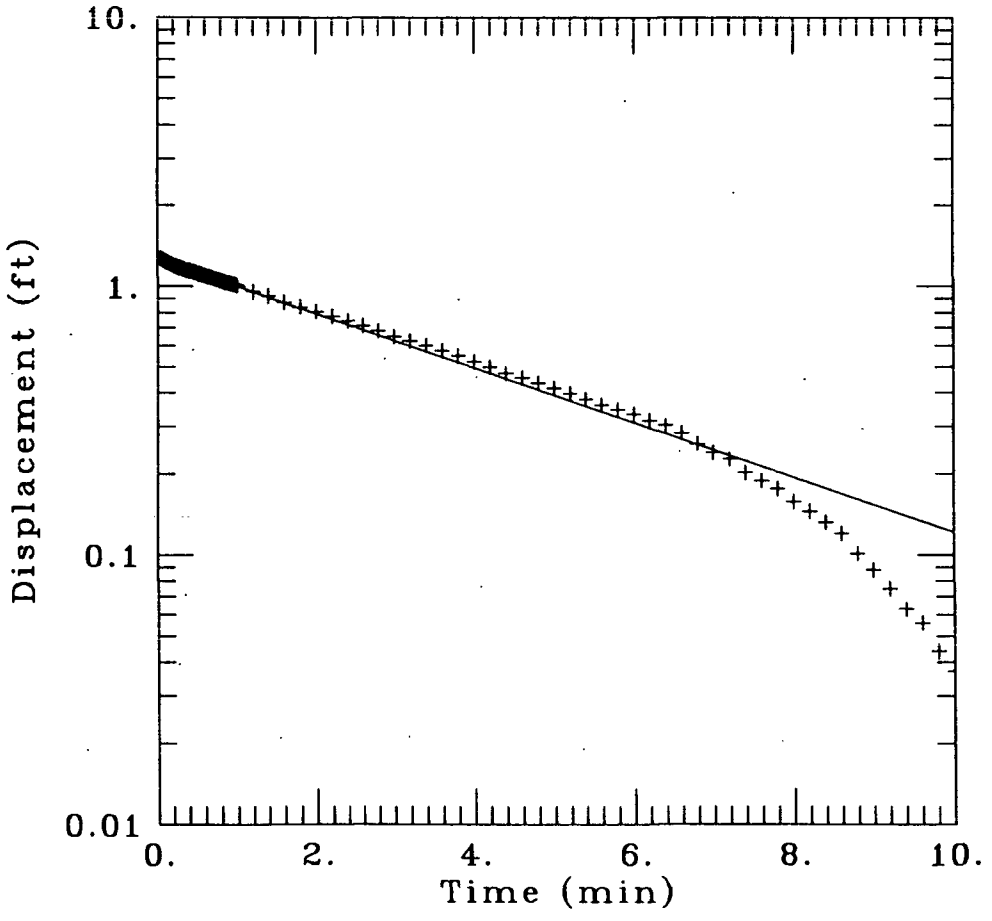
ESTIMATED PARAMETERS:
K = 0.001039 ft/min
y0 = 0.1899 ft

TEST DATA:
H0 = 0.682 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 7.84 ft
H = 7.84 ft

001160.0103

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-040



DATA SET:
mw-040a.dat
07/29/94

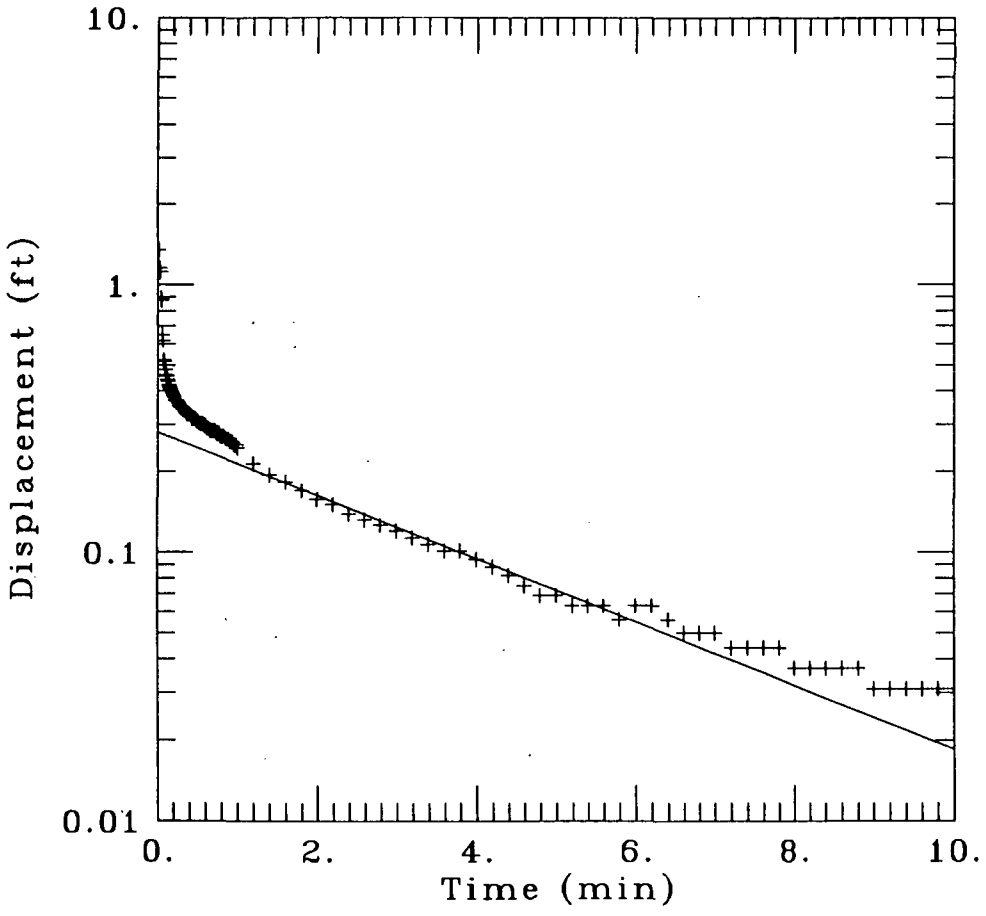
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
K = 0.00103 ft/min
y0 = 1.267 ft

TEST DATA:
H0 = 1.27 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 6.9 ft
H = 6.9 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-040I



DATA SET:
mw-040i.dat
07/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

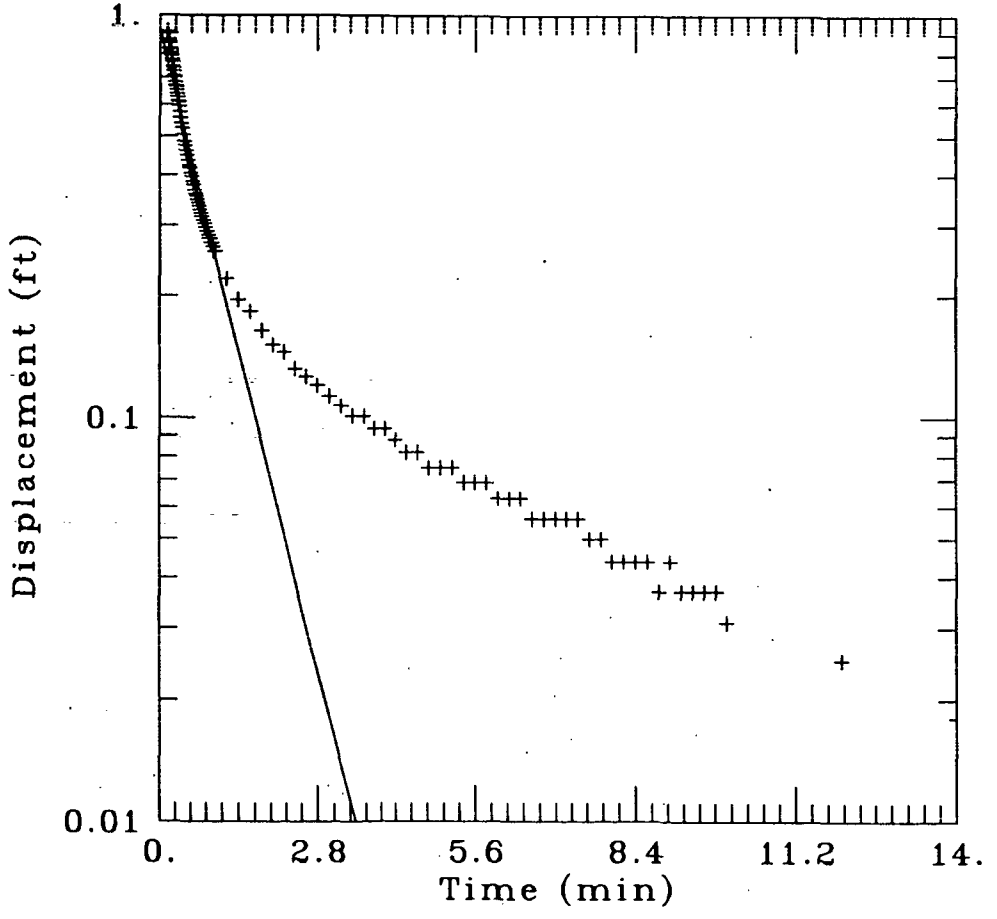
ESTIMATED PARAMETERS:
K = 0.001193 ft/min
y0 = 0.2807 ft

TEST DATA:
H0 = 1.352 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 6.9 ft
H = 6.9 ft

001160.0105

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-041



DATA SET:
mw-041a.dat
07/29/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 May 94

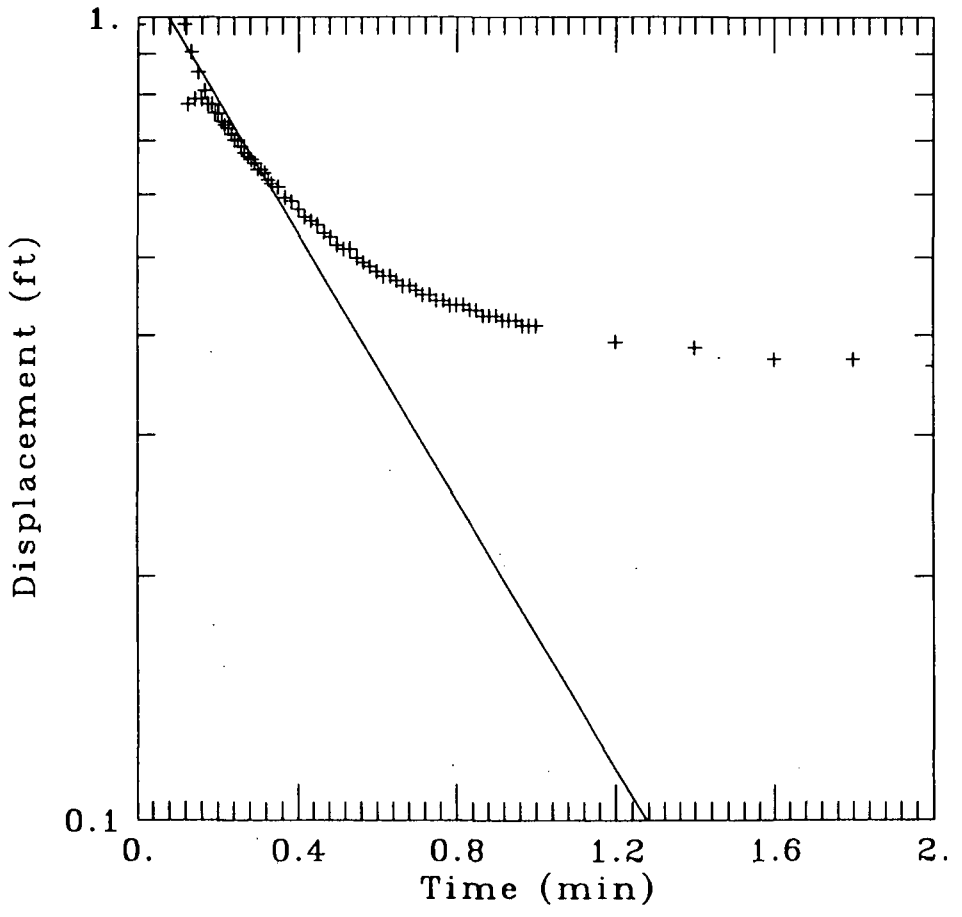
ESTIMATED PARAMETERS:
K = 0.001197 ft/min
y0 = 0.9106 ft

TEST DATA:
H0 = 0.91 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.36 ft
H = 11.36 ft

001160.0106

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-041I



DATA SET:
mw-041i.dat
06/22/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
K = 0.001759 ft/min
y0 = 1.159 ft

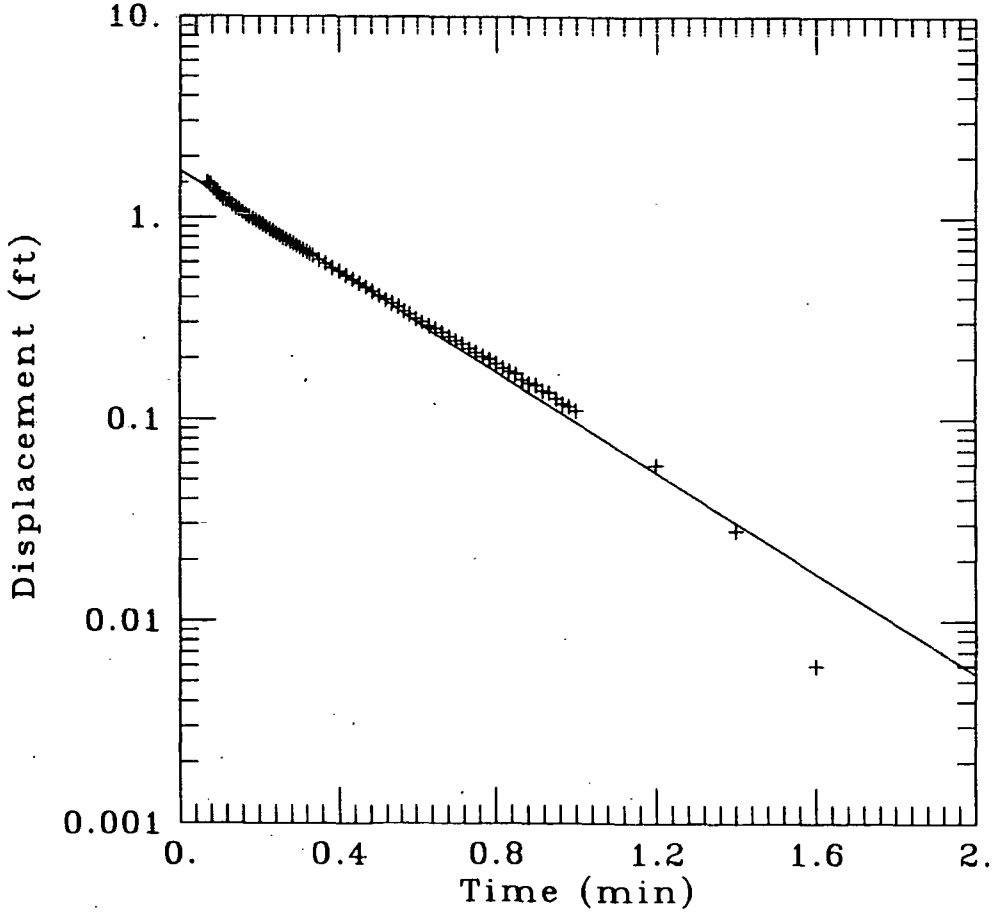
TEST DATA:
H0 = 0.98 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.36 ft
H = 11.36 ft

0-116

001160.0107

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-042



DATA SET:
mw-042a.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 May 94

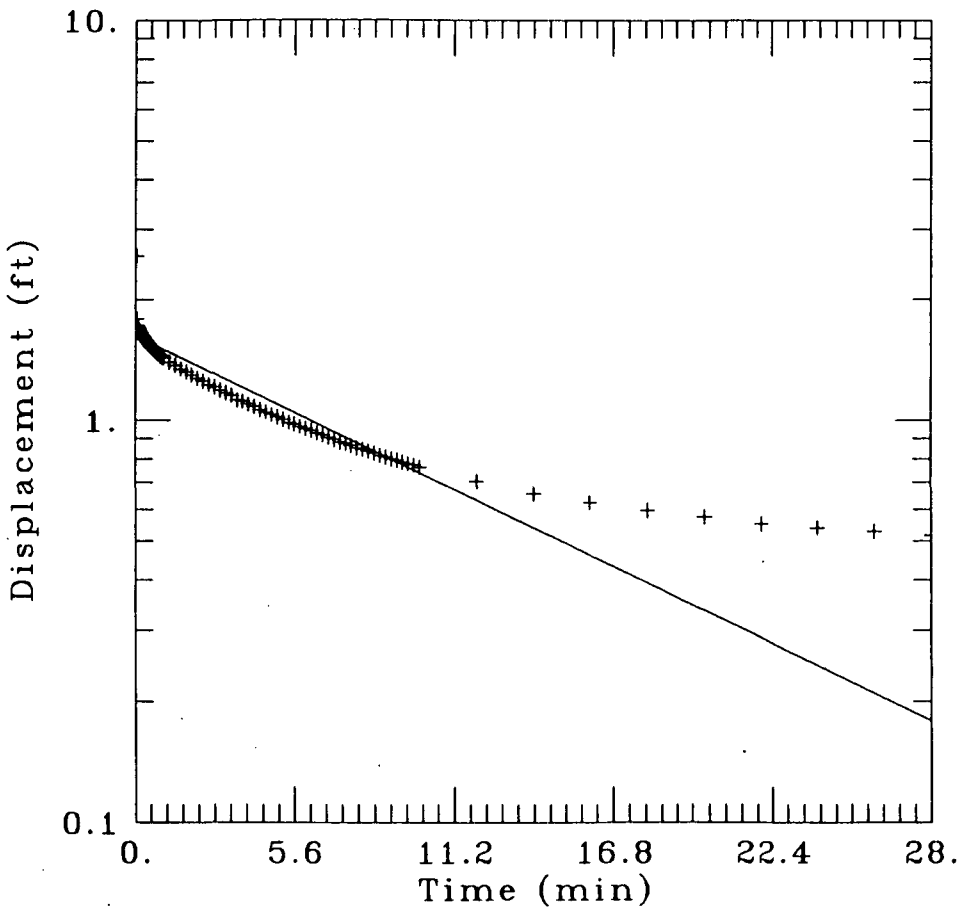
ESTIMATED PARAMETERS:
K = 0.004183 ft/min
y0 = 1.705 ft

TEST DATA:
H0 = 1.488 ft
rc = 0.083 ft
rw = 0.1666 ft
L = 10. ft
b = 10. ft
H = 60. ft

001160.0108

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-042I



DATA SET:
MW-042I.DAT
06/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

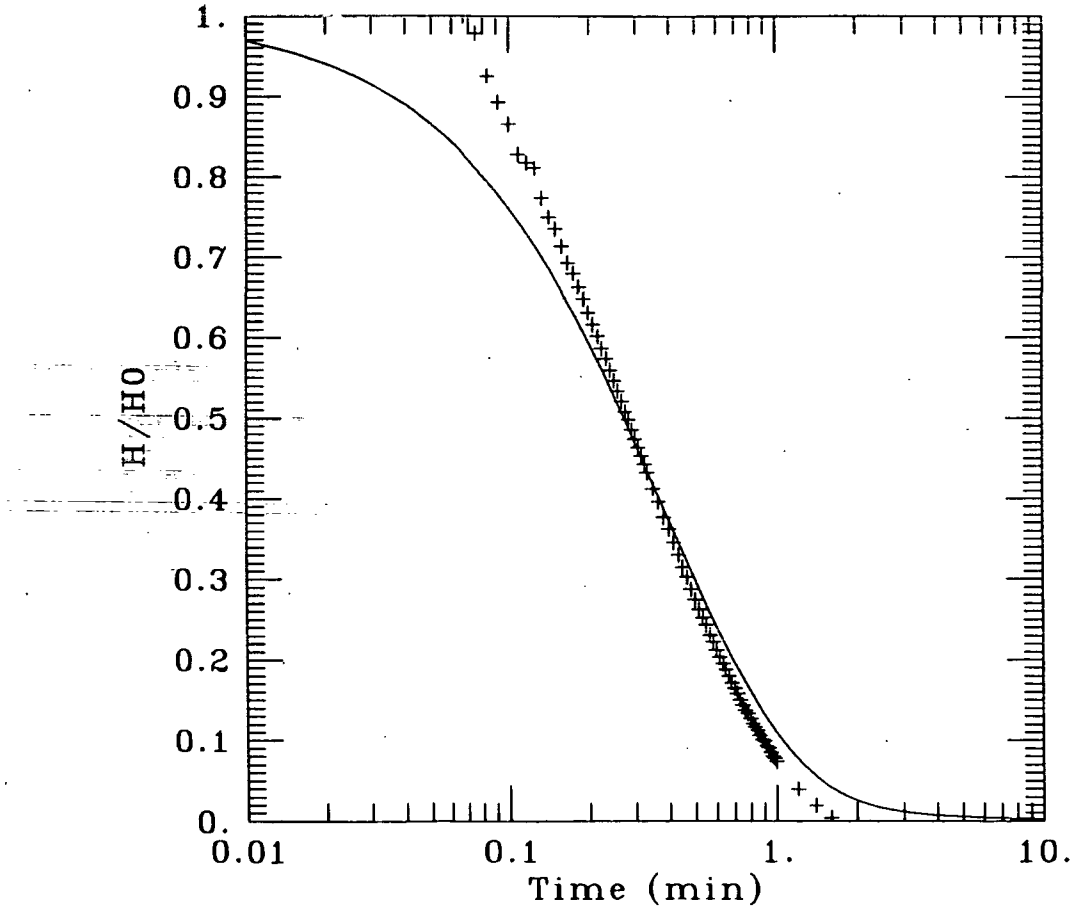
ESTIMATED PARAMETERS:
K = 0.0001148 ft/min
y0 = 1.623 ft

TEST DATA:
H0 = 2.579 ft
rc = 0.083 ft
rw = 0.166 ft
L = 10. ft
b = 10. ft
H = 60. ft

001160.0109

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-042



DATA SET:
mw-042a.dat
07/19/94

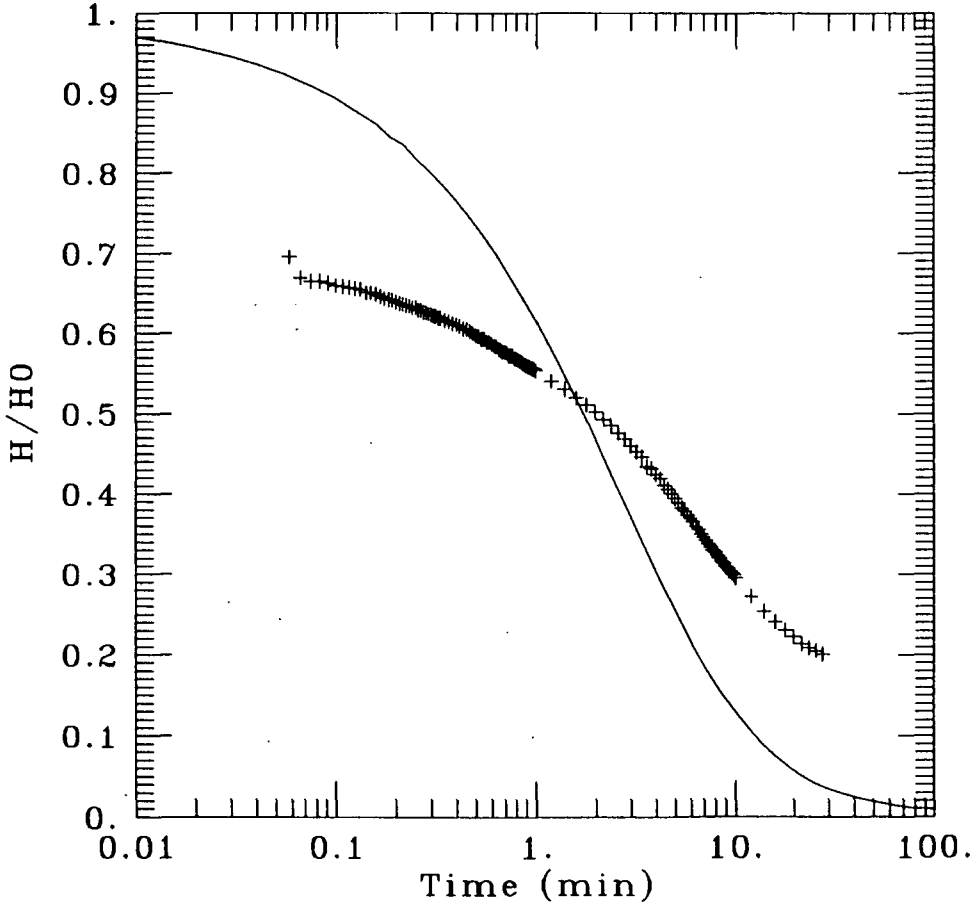
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
25 May 94

ESTIMATED PARAMETERS:
T = 0.08084 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.488 ft
rc = 0.083 ft
rw = 0.1666 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-042I



DATA SET:
mw-042i.dat
07/11/94

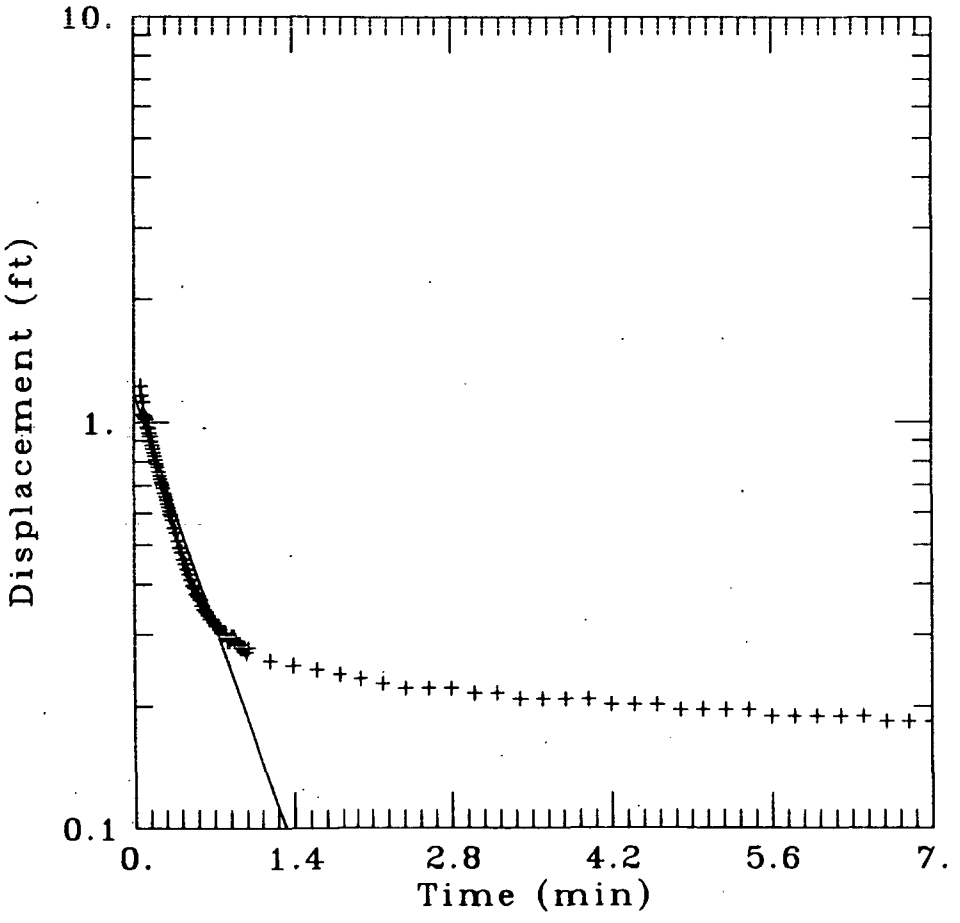
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
T = 0.002201 ft^2/min
S = 0.01198

TEST DATA:
HO = 2.579 ft
rc = 0.083 ft
rw = 0.166 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-043



DATA SET:
mw-043a.dat
07/13/94

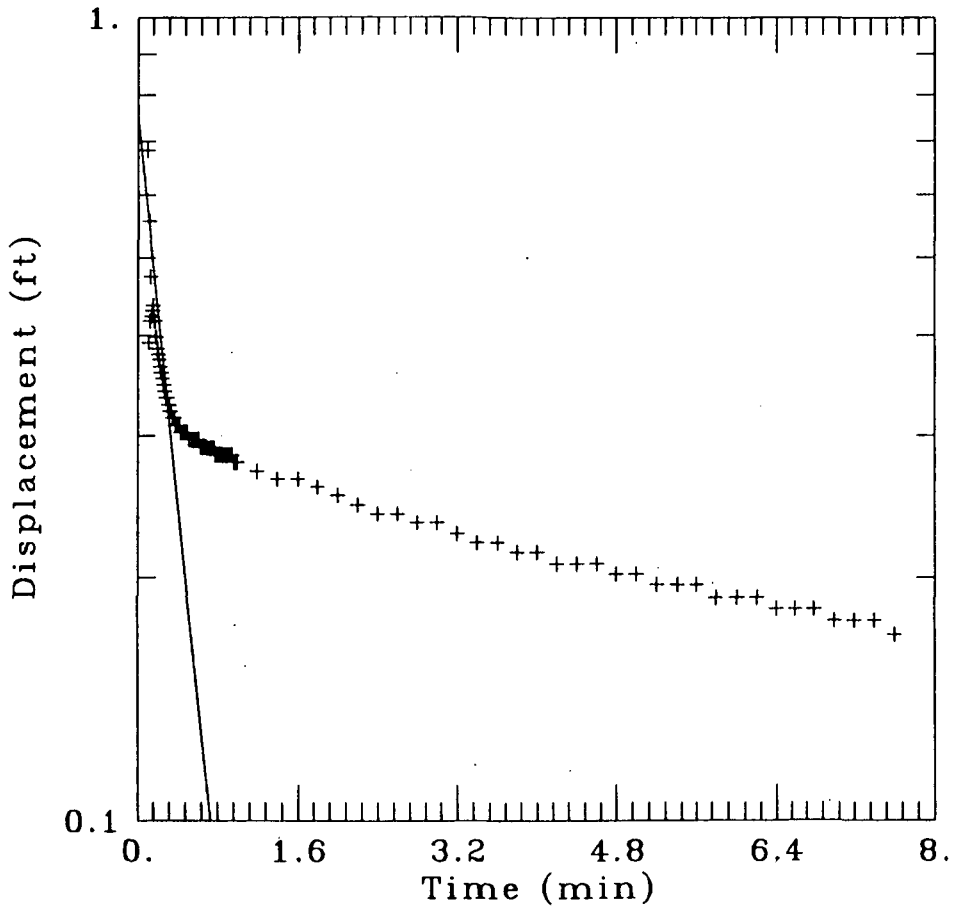
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
K = 0.001641 ft/min
y0 = 1.171 ft

TEST DATA:
H0 = 1.226 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 10.01 ft
H = 10.01 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfil

MW-043I



DATA SET:
mw-043i.dat
07/19/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

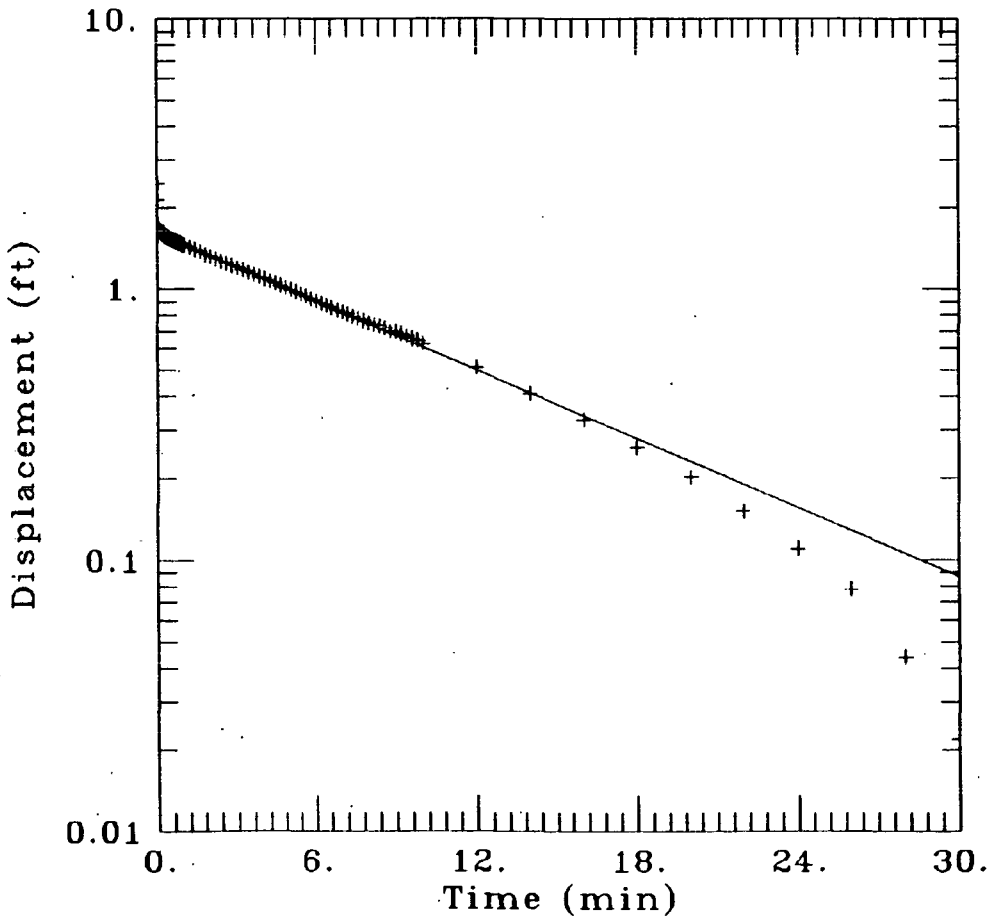
ESTIMATED PARAMETERS:
K = 0.002456 ft/min
y0 = 0.7542 ft

TEST DATA:
H0 = 0.683 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 10.01 ft
H = 10.01 ft

001160.0113

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-044



DATA SET:
MW-044A2 DAT
06/28/94

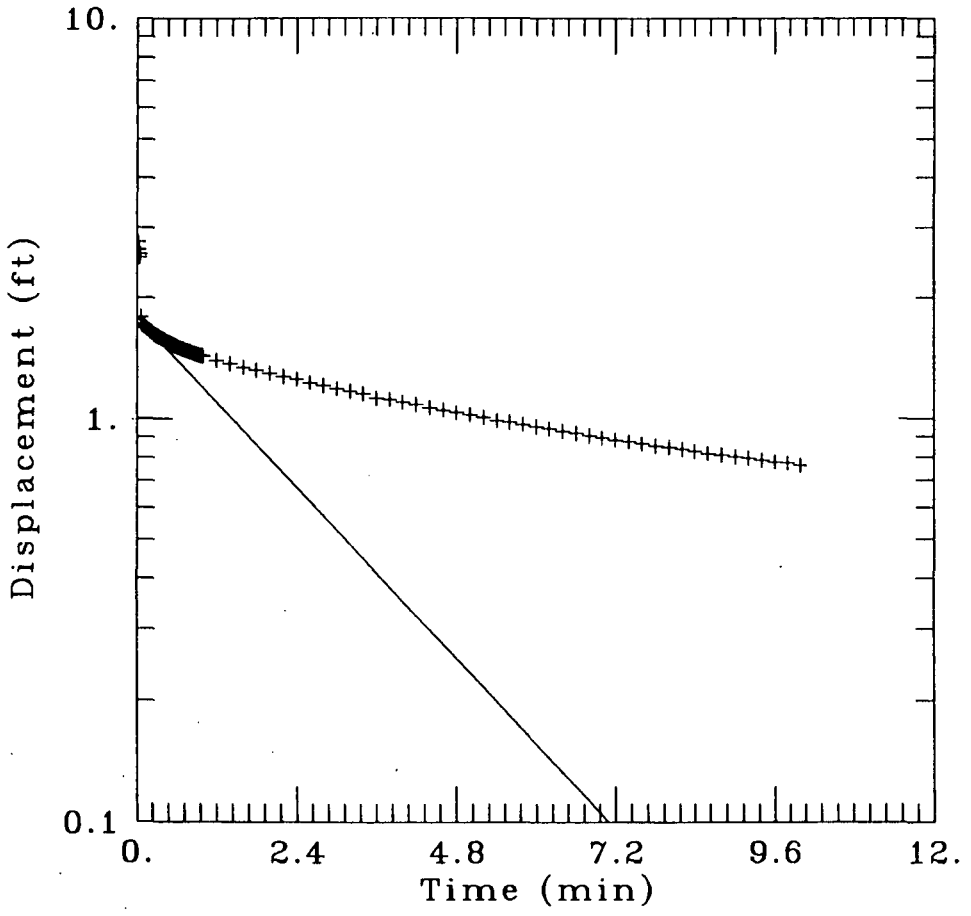
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 May 94

ESTIMATED PARAMETERS:
K = 0.0001417 ft/min
y0 = 1.603 ft

TEST DATA:
H0 = 2.448 ft
rc = 0.083 ft
rw = 0.1667 ft
L = 10. ft
b = 10. ft
H = 61.27 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-044I



DATA SET:
mw-044i.dat
07/19/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
25 MAY 94

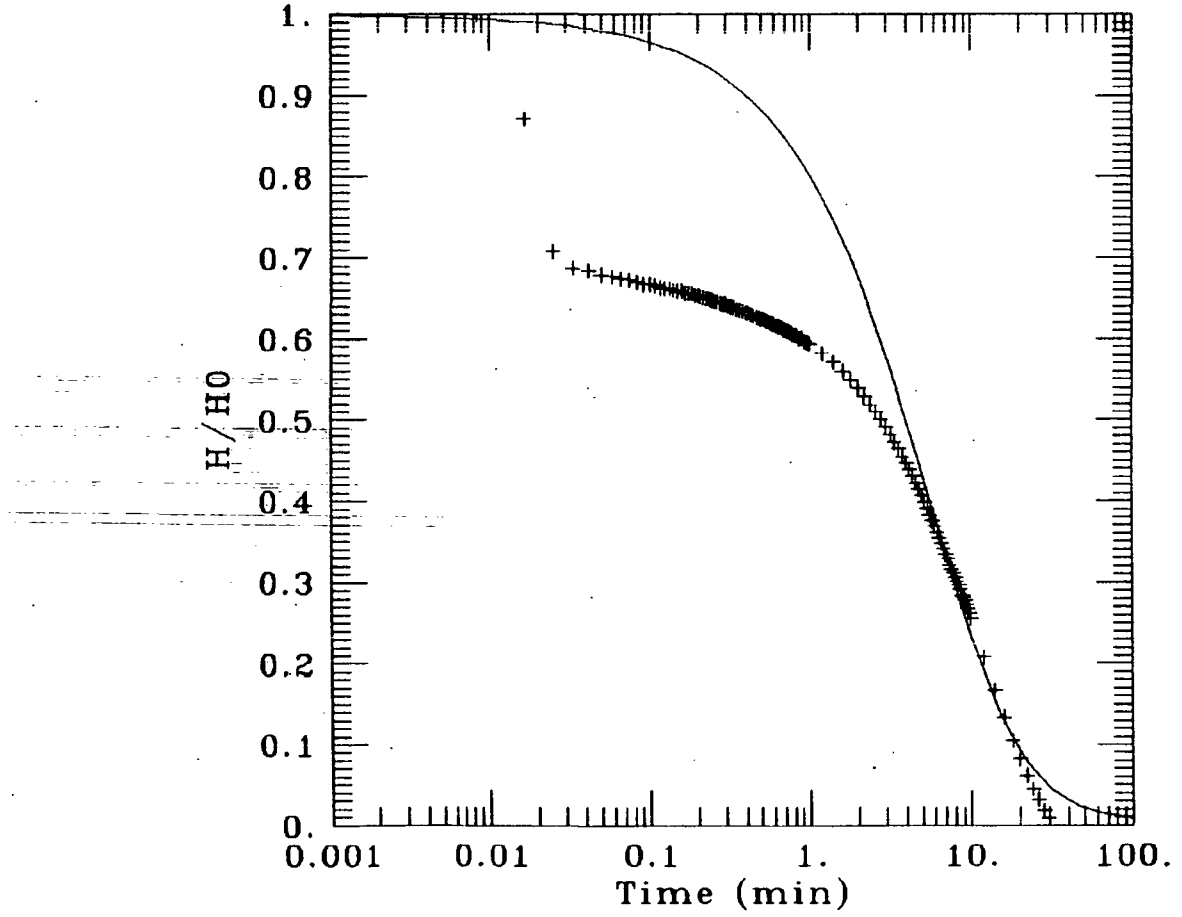
ESTIMATED PARAMETERS:
K = 0.0003722 ft/min
y0 = 1.789 ft

TEST DATA:
H0 = 2.759 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 11.36 ft
H = 11.36 ft

001160.0115

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-044



DATA SET:
MW-044A2 DAT
06/28/94

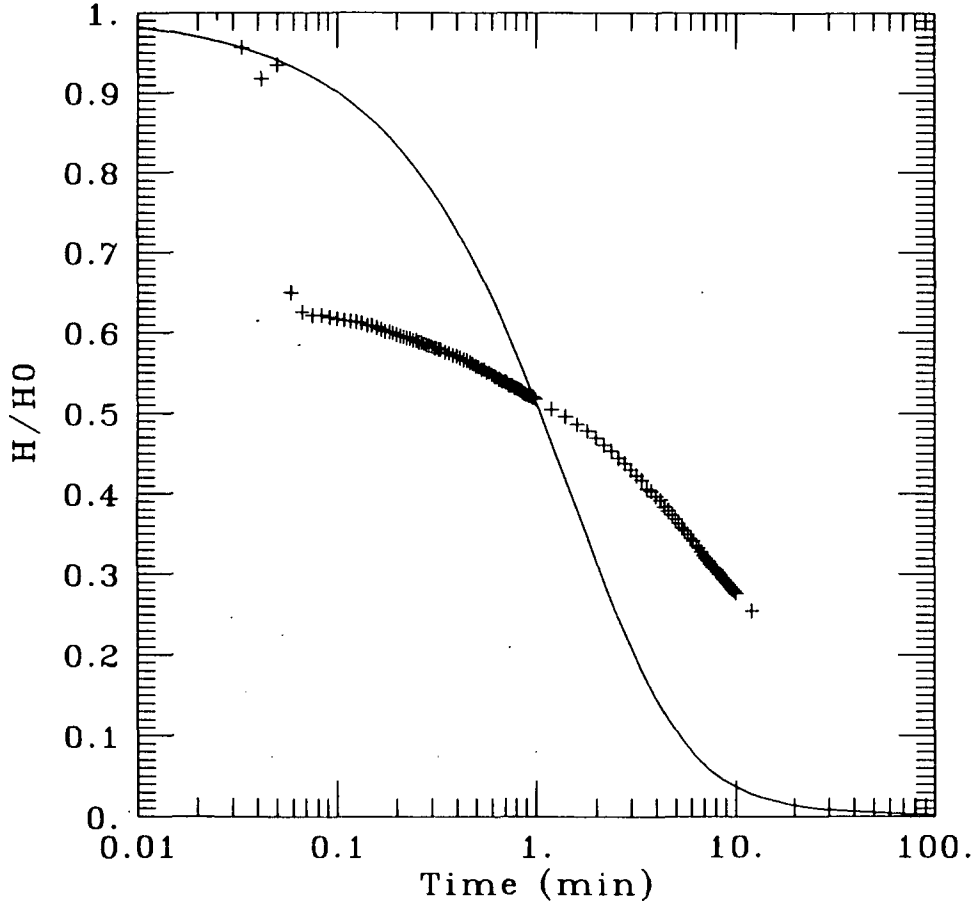
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al
TEST DATE:
25 May 94

ESTIMATED PARAMETERS:
T = 0.002322 ft^2/min
S = 0.0002042

TEST DATA:
H0 = 2.448 ft
rc = 0.083 ft
rw = 0 1667 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-044I



DATA SET:
mw-044i.dat
07/19/94

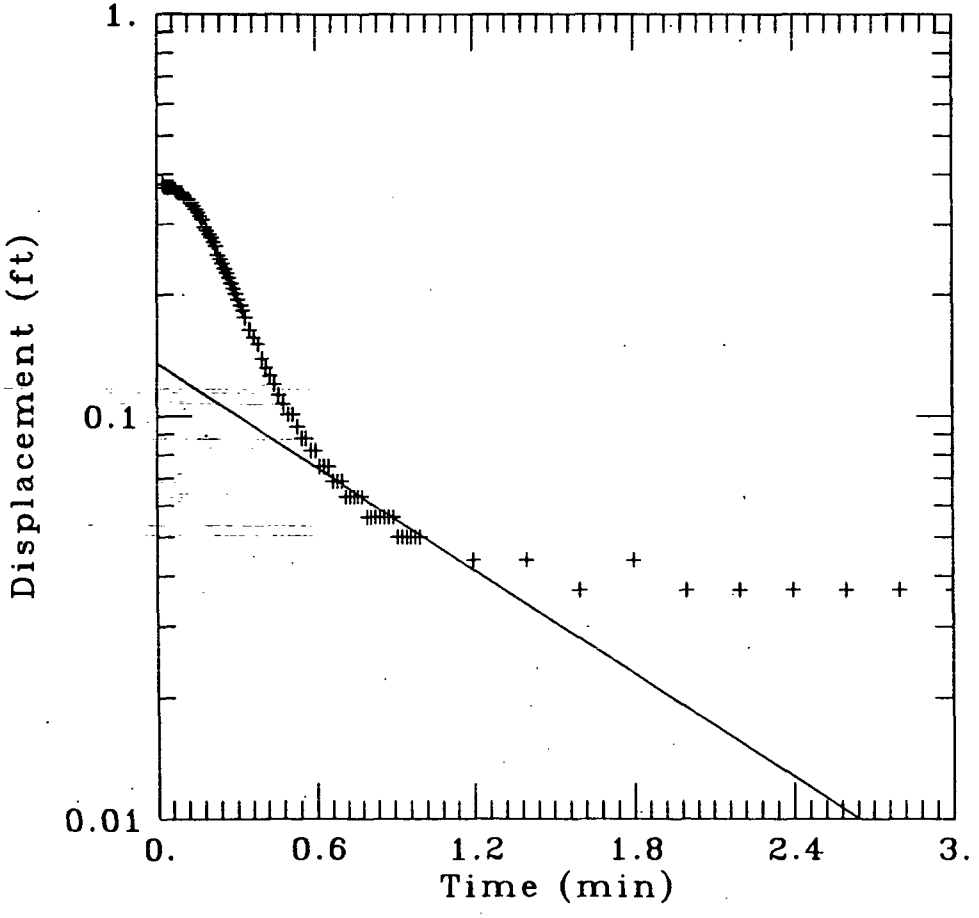
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
T = 0.00796 ft^2/min
S = 0.0001

TEST DATA:
H0 = 2.759 ft
rc = 0.083 ft
rw = 0.33 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-046



DATA SET:
mw-046a.dat
07/22/94

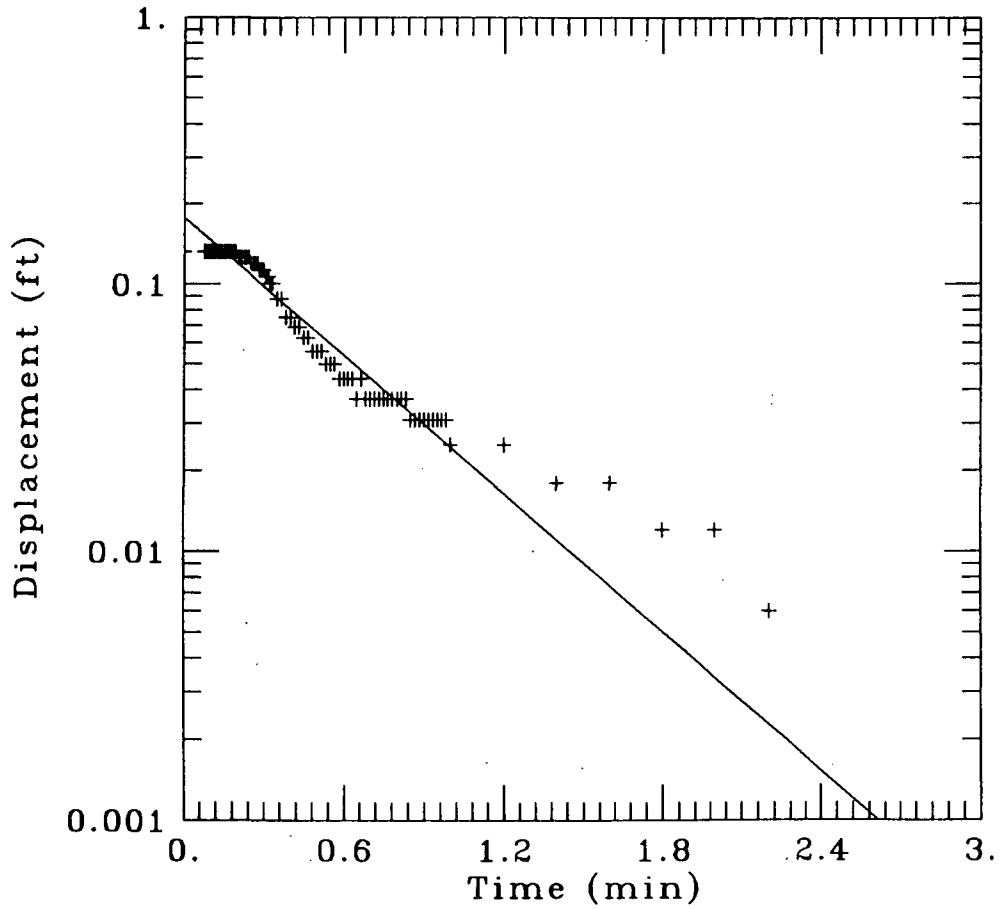
AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
24 MAY 94

ESTIMATED PARAMETERS:
K = 0.004038 ft/min
y0 = 0.1352 ft

TEST DATA:
H0 = 0.379 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 5.48 ft
H = 5.48 ft

Ecology & Environment, Inc.	Client: USEPA
	Location: Agricultural Street Landfill

MW-046I



DATA SET:
mw-046i.dat
06/22/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
25 MAY 94

ESTIMATED PARAMETERS:
K = 0.008128 ft/min
y0 = 0.1776 ft

TEST DATA:
H0 = 0.132 ft
rc = 0.1936 ft
rw = 0.33 ft
L = 10. ft
b = 5.48 ft
H = 5.48 ft

001160.0119

RISING HEAD/FALLING HEAD TEST DATA

001160.0120

06.212001_DFW1007_TO2-09/07/94-D1

SE2000
Environmental Logger
05/25 18:58

Unit# 404 Test 4

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~029~~ DP 001	MW-~~030~~ DP 002
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 0 05/24 16:01:39

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	0.040
0.0083	0.000	4.061
0.0166	0.000	2.380
0.0250	-0.050	2.566
0.0333	0.088	2.330
0.0416	0.537	1.806
0.0500	0.987	1.787
0.0583	1.303	1.832
0.0666	1.569	1.794
0.0750	0.411	1.797
0.0833	0.202	1.791
0.0916	1.025	1.800
0.1000	0.721	1.797
0.1083	0.696	1.819
0.1166	0.822	1.816
0.1250	0.708	1.806
0.1333	0.778	1.810
0.1416	0.746	1.806
0.1500	0.759	1.810
0.1583	0.753	1.810
0.1666	0.753	1.803
0.1750	0.753	1.810
0.1833	0.753	1.813
0.1916	0.753	1.810
0.2000	0.753	1.813
0.2083	0.753	1.810
0.2166	0.753	1.813
0.2250	0.746	1.813
0.2333	0.746	1.813
0.2416	0.740	1.810
0.2500	0.734	1.816
0.2583	0.727	1.813
0.2666	0.727	1.813
0.2750	0.721	1.813
0.2833	0.715	1.816
0.2916	0.715	1.813

001160.0122

0.3000	0.715	1.816
0.3083	0.715	1.813
0.3166	0.715	1.813
0.3250	0.715	1.816
0.3333	0.715	1.813
0.3500	0.708	1.813
0.3666	0.708	1.813
0.3833	0.708	1.819
0.4000	0.708	1.816
0.4166	0.708	1.816
0.4333	0.702	1.816
0.4500	0.702	1.816
0.4666	0.702	1.819
0.4833	0.702	1.819
0.5000	0.702	1.816
0.5166	0.702	1.819
0.5333	0.702	1.819
0.5500	0.696	1.816
0.5666	0.696	1.816
0.5833	0.696	1.819
0.6000	0.696	1.819
0.6166	0.696	1.822
0.6333	0.689	1.819
0.6500	0.696	1.819
0.6666	0.689	1.822
0.6833	0.689	1.819
0.7000	0.689	1.819
0.7166	0.689	1.819
0.7333	0.689	1.819
0.7500	0.683	1.822
0.7666	0.683	1.822
0.7833	0.683	1.819
0.8000	0.683	1.822
0.8166	0.683	1.819
0.8333	0.683	1.822
0.8500	0.683	1.816
0.8666	0.683	1.822
0.8833	0.683	1.822
0.9000	0.677	1.822
0.9166	0.677	1.819
0.9333	0.677	1.822
0.9500	0.677	1.822
0.9666	0.677	1.828
0.9833	0.677	1.825
1.0000	0.677	1.825
1.2000	0.670	1.832
1.4000	0.658	1.832
1.6000	0.651	1.838
1.8000	0.645	1.841
2.0000	0.639	1.844
2.2000	0.632	1.851
2.4000	0.626	1.844
2.6000	0.620	1.854
2.8000	0.613	1.860
3.0000	0.613	1.866
3.2000	0.607	1.866
3.4000	0.601	1.873
3.6000	0.594	1.879
3.8000	0.588	1.879
4.0000	0.588	1.882

4.2000	0.588	1.885
4.4000	0.582	1.895
4.6000	0.575	1.895
4.8000	0.575	1.901
5.0000	0.563	1.914
5.2000	0.556	1.910
5.4000	0.550	1.920
5.6000	0.550	1.920
5.8000	0.544	1.929
6.0000	0.544	1.936
6.2000	0.537	1.933
6.4000	0.544	1.936
6.6000	0.537	1.951
6.8000	0.531	1.945
7.0000	0.531	1.951
7.2000	0.525	1.951
7.4000	0.525	1.958
7.6000	0.518	1.964
7.8000	0.512	1.970
8.0000	0.512	1.974
8.2000	0.512	1.980
8.4000	0.512	1.980
8.6000	0.506	1.986
8.8000	0.499	1.992
9.0000	0.499	1.996
9.2000	0.493	1.999
9.4000	0.493	2.002
9.6000	0.487	2.005
9.8000	0.480	2.011
10.0000	0.480	2.018
12.0000	0.449	2.065
14.0000	0.423	2.106
16.0000	0.392	2.141
18.0000	0.373	2.194
20.0000	0.354	2.235
22.0000	0.329	2.273
24.0000	0.310	2.317
26.0000	0.303	2.355
28.0000	0.278	2.396
30.0000	0.259	2.434
32.0000	0.246	2.472
34.0000	0.240	2.510
36.0000	0.227	2.734

001160.0124

SE2000
Environmental Logger
05/25 19:01

Unit# 404 Test 4

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~029~~ 001	MW-~~030~~ 002
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 1 05/24 16:37:50

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	2.188
0.0083	0.240	1.412
0.0166	-0.480	1.649
0.0250	-0.139	1.822
0.0333	-0.828	1.141
0.0416	-0.797	0.375
0.0500	-0.771	0.703
0.0583	-1.050	0.722
0.0666	-1.202	0.778
0.0750	-1.037	0.709
0.0833	-1.006	0.700
0.0916	-1.018	0.706
0.1000	-1.012	0.718
0.1083	-0.993	0.741
0.1166	-0.987	0.741
0.1250	-0.987	0.709
0.1333	-0.980	0.725
0.1416	-0.974	0.715
0.1500	-0.968	0.709
0.1583	-0.968	0.712
0.1666	-0.961	0.725
0.1750	-0.955	0.734
0.1833	-0.955	0.728
0.1916	-0.949	0.731
0.2000	-0.949	0.728
0.2083	-0.949	0.731
0.2166	-0.942	0.737
0.2250	-0.942	0.734
0.2333	-0.936	0.734
0.2416	-0.936	0.734
0.2500	-0.930	0.734
0.2583	-0.930	0.737
0.2666	-0.930	0.737
0.2750	-0.930	0.741
0.2833	-0.923	0.737
0.2916	-0.923	0.737

001160.0125

0.3000	-0.930	0.737
0.3083	-0.930	0.741
0.3166	-0.936	0.741
0.3250	-0.942	0.741
0.3333	-0.942	0.741
0.3500	-0.942	0.744
0.3666	-0.942	0.744
0.3833	-0.942	0.741
0.4000	-0.942	0.747
0.4166	-0.942	0.747
0.4333	-0.936	0.750
0.4500	-0.936	0.747
0.4666	-0.930	0.747
0.4833	-0.936	0.750
0.5000	-0.930	0.747
0.5166	-0.930	0.750
0.5333	-0.930	0.750
0.5500	-0.923	0.753
0.5666	-0.923	0.753
0.5833	-0.923	0.756
0.6000	-0.917	0.753
0.6166	-0.917	0.756
0.6333	-0.917	0.753
0.6500	-0.917	0.756
0.6666	-0.911	0.756
0.6833	-0.911	0.759
0.7000	-0.911	0.759
0.7166	-0.904	0.759
0.7333	-0.911	0.759
0.7500	-0.904	0.756
0.7666	-0.904	0.759
0.7833	-0.904	0.759
0.8000	-0.898	0.763
0.8166	-0.898	0.766
0.8333	-0.898	0.763
0.8500	-0.898	0.759
0.8666	-0.898	0.766
0.8833	-0.892	0.766
0.9000	-0.898	0.759
0.9166	-0.892	0.763
0.9333	-0.892	0.759
0.9500	-0.892	0.769
0.9666	-0.892	0.772
0.9833	-0.885	0.769
1.0000	-0.885	0.772
1.2000	-0.873	0.778
1.4000	-0.860	0.788
1.6000	-0.847	0.797
1.8000	-0.835	0.800
2.0000	-0.828	0.813
2.2000	-0.816	0.819
2.4000	-0.809	0.826
2.6000	-0.797	0.829
2.8000	-0.790	0.835
3.0000	-0.784	0.848
3.2000	-0.778	0.851
3.4000	-0.765	0.857
3.6000	-0.765	0.867
3.8000	-0.759	0.873
4.0000	-0.746	0.879

4.2000	-0.740	0.889
4.4000	-0.727	0.895
4.6000	-0.727	0.901
4.8000	-0.721	0.908
5.0000	-0.721	0.920
5.2000	-0.708	0.923
5.4000	-0.708	0.930
5.6000	-0.702	0.936
5.8000	-0.696	0.942
6.0000	-0.689	0.952
6.2000	-0.683	0.958
6.4000	-0.683	0.968
6.6000	-0.677	0.971
6.8000	-0.670	0.983
7.0000	-0.670	0.986
7.2000	-0.664	0.996
7.4000	-0.658	0.999
7.6000	-0.658	1.009
7.8000	-0.651	1.012
8.0000	-0.645	1.021
8.2000	-0.639	1.027
8.4000	-0.639	1.034
8.6000	-0.632	1.037
8.8000	-0.632	1.040
9.0000	-0.626	1.053
9.2000	-0.626	1.062
9.4000	-0.620	1.068
9.6000	-0.613	1.075
9.8000	-0.607	1.081
10.0000	-0.607	1.087
12.0000	-0.569	1.154
14.0000	-0.544	1.220
16.0000	-0.512	1.283
18.0000	-0.493	1.346
20.0000	-0.461	1.406
22.0000	-0.442	1.466
24.0000	-0.430	1.526
26.0000	-0.411	1.582
28.0000	-0.392	1.642
30.0000	-0.379	1.699
32.0000	-0.366	1.753
34.0000	-0.354	1.806
36.0000	-0.341	1.860
38.0000	-0.329	1.910
40.0000	-0.322	1.964

SE2000
Environmental Logger
05/24 12:05

Unit# 404 Test 1

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-003	MW-004
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 1 05/23 09:39:18

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.012	-1.408
0.0083	0.012	-1.559
0.0166	0.012	-2.659
0.0250	-0.012	-2.574
0.0333	0.006	-2.276
0.0416	-0.139	-2.447
0.0500	0.170	-2.357
0.0583	-0.708	-2.306
0.0666	-0.405	-2.215
0.0750	-1.480	-2.170
0.0833	0.082	-2.069
0.0916	-1.550	-1.993
0.1000	-1.291	-1.907
0.1083	-1.291	-1.872
0.1166	-1.284	-1.827
0.1250	-1.265	-1.756
0.1333	-1.234	-1.771
0.1416	-1.189	-1.660
0.1500	-1.170	-1.615
0.1583	-1.145	-1.569
0.1666	-1.120	-1.524
0.1750	-1.107	-1.478
0.1833	-1.082	-1.438
0.1916	-1.056	-1.403
0.2000	-1.031	-1.362
0.2083	-1.006	-1.327
0.2166	-0.993	-1.292
0.2250	-0.974	-1.251
0.2333	-0.955	-1.191
0.2416	-0.936	-1.176
0.2500	-0.911	-1.140
0.2583	-0.905	-1.105
0.2666	-0.892	-1.085
0.2750	-0.860	-1.064
0.2833	-0.854	-1.034
0.2916	-0.835	-1.019

001160.0128

0.3000	-0.810	-0.999
0.3083	-0.803	-0.969
0.3166	-0.791	-0.928
0.3250	-0.772	-0.928
0.3333	-0.759	-0.913
0.3500	-0.734	-0.847
0.3666	-0.702	-0.812
0.3833	-0.677	-0.762
0.4000	-0.651	-0.731
0.4166	-0.626	-0.701
0.4333	-0.607	-0.661
0.4500	-0.575	-0.630
0.4666	-0.563	-0.585
0.4833	-0.544	-0.550
0.5000	-0.519	-0.524
0.5166	-0.512	-0.499
0.5333	-0.487	-0.469
0.5500	-0.462	-0.449
0.5666	-0.449	-0.423
0.5833	-0.430	-0.398
0.6000	-0.411	-0.378
0.6166	-0.405	-0.358
0.6333	-0.398	-0.338
0.6500	-0.379	-0.312
0.6666	-0.341	-0.328
0.6833	-0.348	-0.287
0.7000	-0.341	-0.267
0.7166	-0.329	-0.262
0.7333	-0.316	-0.242
0.7500	-0.297	-0.237
0.7666	-0.297	-0.217
0.7833	-0.284	-0.196
0.8000	-0.278	-0.186
0.8166	-0.265	-0.176
0.8333	-0.253	-0.161
0.8500	-0.240	-0.156
0.8666	-0.234	-0.146
0.8833	-0.227	-0.131
0.9000	-0.215	-0.126
0.9166	-0.215	-0.121
0.9333	-0.215	-0.105
0.9500	-0.202	-0.100
0.9666	-0.202	-0.090
0.9833	-0.189	-0.085
1.0000	-0.183	-0.080
1.2000	-0.120	-0.010
1.4000	-0.082	0.025
1.6000	-0.063	0.050
1.8000	-0.056	0.070
2.0000	-0.050	0.080
2.2000	-0.031	0.085
2.4000	-0.031	0.095
2.6000	-0.025	0.090
2.8000	-0.025	0.105
3.0000	-0.025	0.136

SE2000
Environmental Logger
05/24 11:51

Unit# 404 Test 1

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-003	MW-004
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 0 05/23 09:32:33

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.006	0.065
0.0083	0.000	0.595
0.0166	-0.006	0.595
0.0250	-0.012	0.595
0.0333	0.000	0.595
0.0416	1.025	0.595
0.0500	1.924	0.595
0.0583	2.184	0.595
0.0666	2.222	0.595
0.0750	0.848	0.595
0.0833	0.348	0.595
0.0916	1.487	0.595
0.1000	0.930	0.595
0.1083	0.917	0.595
0.1166	1.126	0.595
0.1250	0.860	0.595
0.1333	1.038	0.595
0.1416	0.911	0.595
0.1500	0.943	0.595
0.1583	0.905	0.595
0.1666	0.905	0.595
0.1750	0.873	0.595
0.1833	0.873	0.595
0.1916	0.867	0.595
0.2000	0.841	0.595
0.2083	0.829	0.595
0.2166	0.810	0.595
0.2250	0.810	0.595
0.2333	0.791	0.595
0.2416	0.778	0.595
0.2500	0.784	0.595
0.2583	0.746	0.595
0.2666	0.746	0.595
0.2750	0.740	0.595
0.2833	0.734	0.595
0.2916	0.709	0.595

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0.3000	0.702	0.595
0.3083	0.690	0.595
0.3166	0.690	0.595
0.3250	0.683	0.595
0.3333	0.658	0.595
0.3500	0.645	0.595
0.3666	0.620	0.595
0.3833	0.607	0.595
0.4000	0.595	0.595
0.4166	0.563	0.595
0.4333	0.550	0.595
0.4500	0.544	0.595
0.4666	0.525	0.595
0.4833	0.512	0.595
0.5000	0.493	0.595
0.5166	0.474	0.595
0.5333	0.455	0.595
0.5500	0.462	0.595
0.5666	0.443	0.595
0.5833	0.424	0.590
0.6000	0.417	0.570
0.6166	0.398	0.550
0.6333	0.392	0.535
0.6500	0.379	0.514
0.6666	0.367	0.499
0.6833	0.354	0.484
0.7000	0.341	0.595
0.7166	0.335	0.454
0.7333	0.316	0.444
0.7500	0.322	0.429
0.7666	0.303	0.413
0.7833	0.291	0.403
0.8000	0.291	0.393
0.8166	0.272	0.378
0.8333	0.278	0.368
0.8500	0.272	0.358
0.8666	0.265	0.348
0.8833	0.259	0.338
0.9000	0.240	0.328
0.9166	0.240	0.323
0.9333	0.227	0.312
0.9500	0.227	0.302
0.9666	0.227	0.297
0.9833	0.215	0.287
1.0000	0.221	0.287
1.2000	0.145	0.217
1.4000	0.113	0.181
1.6000	0.088	0.156
1.8000	0.069	0.141
2.0000	0.056	0.131
2.2000	0.050	0.126
2.4000	0.037	0.116
2.6000	0.031	0.116
2.8000	0.031	0.111
3.0000	0.025	0.111
3.2000	0.031	0.105
3.4000	0.025	0.105
3.6000	0.025	0.105
3.8000	0.012	0.105
4.0000	0.018	0.105

4.2000	0.012	0.105
4.4000	0.018	0.105
4.6000	0.018	0.105
4.8000	0.025	0.105
5.0000	0.012	0.100
5.2000	0.012	0.111
5.4000	0.006	0.105
5.6000	0.018	0.105
5.8000	0.006	0.105
6.0000	0.018	0.095
6.2000	0.012	0.116
6.4000	0.000	0.105
6.6000	0.018	0.111

SE2000
Environmental Logger
05/26 13:02

Unit# 404 Test 14

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-~~006~~ 004 BP
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 0 05/26 07:46:11

Elapsed Time	INPUT 1
0.0000	0.652
0.0083	2.349
0.0166	4.361
0.0250	2.749
0.0333	2.759
0.0416	2.629
0.0500	2.276
0.0583	1.835
0.0666	1.929
0.0750	1.907
0.0833	1.854
0.0916	1.841
0.1000	1.816
0.1083	1.781
0.1166	1.765
0.1250	1.743
0.1333	1.721
0.1416	1.696
0.1500	1.674
0.1583	1.664
0.1666	1.623
0.1750	1.601
0.1833	1.582
0.1916	1.560
0.2000	1.538
0.2083	1.522
0.2166	1.497
0.2250	1.481
0.2333	1.463
0.2416	1.447
0.2500	1.431
0.2583	1.412
0.2666	1.396
0.2750	1.381
0.2833	1.365
0.2916	1.352

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0.3000	1.336
0.3083	1.324
0.3166	1.308
0.3250	1.295
0.3333	1.283
0.3500	1.258
0.3666	1.232
0.3833	1.210
0.4000	1.188
0.4166	1.169
0.4333	1.144
0.4500	1.131
0.4666	1.113
0.4833	1.097
0.5000	1.081
0.5166	1.065
0.5333	1.056
0.5500	1.040
0.5666	1.021
0.5833	1.012
0.6000	0.999
0.6166	0.990
0.6333	0.977
0.6500	0.964
0.6666	0.955
0.6833	0.945
0.7000	0.936
0.7166	0.930
0.7333	0.920
0.7500	0.914
0.7666	0.904
0.7833	0.898
0.8000	0.892
0.8166	0.882
0.8333	0.879
0.8500	0.873
0.8666	0.860
0.8833	0.860
0.9000	0.857
0.9166	0.848
0.9333	0.845
0.9500	0.848
0.9666	0.841
0.9833	0.819
1.0000	0.822
1.2000	0.788
1.4000	0.759
1.6000	0.744
1.8000	0.734
2.0000	0.725
2.2000	0.731
2.4000	0.715
2.6000	0.715
2.8000	0.709
3.0000	0.709
3.2000	0.712
3.4000	0.706
3.6000	0.706
3.8000	0.744
4.0000	0.706

SE2000
Environmental Logger
05/26 13:03

Unit# 404 Test 14

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-~~006~~ DP 004
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 1 05/26 07:50:17

Elapsed Time	INPUT 1
0.0000	-0.003
0.0083	-0.003
0.0166	-0.170
0.0250	-0.712
0.0333	-0.684
0.0416	-0.949
0.0500	-0.898
0.0583	-0.832
0.0666	-0.797
0.0750	-0.747
0.0833	-0.696
0.0916	-0.658
0.1000	-0.621
0.1083	-0.570
0.1166	-0.539
0.1250	-0.513
0.1333	-0.498
0.1416	-0.435
0.1500	-0.400
0.1583	-0.375
0.1666	-0.353
0.1750	-0.321
0.1833	-0.293
0.1916	-0.261
0.2000	-0.236
0.2083	-0.214
0.2166	-0.192
0.2250	-0.160
0.2333	-0.160
0.2416	-0.220
0.2500	-0.223
0.2583	-0.230
0.2666	-0.100
0.2750	-0.066
0.2833	-0.037
0.2916	-0.031

0.3000	-0.006
0.3083	0.000
0.3166	0.012
0.3250	0.028
0.3333	0.047
0.3500	0.075
0.3666	0.104
0.3833	0.135
0.4000	0.160
0.4166	0.182
0.4333	0.204
0.4500	0.227
0.4666	0.252
0.4833	0.268
0.5000	0.286
0.5166	0.305
0.5333	0.321
0.5500	0.337
0.5666	0.356
0.5833	0.368
0.6000	0.381
0.6166	0.394
0.6333	0.413
0.6500	0.422
0.6666	0.431
0.6833	0.454
0.7000	0.438
0.7166	0.472
0.7333	0.469
0.7500	0.482
0.7666	0.488
0.7833	0.501
0.8000	0.517
0.8166	0.507
0.8333	0.510
0.8500	0.539
0.8666	0.529
0.8833	0.529
0.9000	0.542
0.9166	0.551
0.9333	0.551
0.9500	0.554
0.9666	0.561
0.9833	0.567
1.0000	0.573
1.2000	0.611
1.4000	0.633
1.6000	0.652
1.8000	0.658
2.0000	0.668
2.2000	0.671

SE2000
Environmental Logger
05/24 12:12

Unit# 404 Test 2

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-005	MW-006
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 0 05/23 09:59:43

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	1.024
0.0083	0.012	1.110
0.0166	0.037	0.378
0.0250	0.582	2.215
0.0333	1.398	3.139
0.0416	1.556	2.710
0.0500	1.461	2.579
0.0583	0.360	3.154
0.0666	0.784	3.447
0.0750	1.189	2.654
0.0833	0.904	1.801
0.0916	0.689	2.023
0.1000	0.949	2.175
0.1083	0.968	2.311
0.1166	0.803	2.049
0.1250	0.860	2.301
0.1333	0.936	1.882
0.1416	0.847	1.822
0.1500	0.847	1.781
0.1583	0.892	2.013
0.1666	0.860	2.392
0.1750	0.854	1.867
0.1833	0.879	2.044
0.1916	0.860	1.923
0.2000	0.847	2.478
0.2083	0.866	1.907
0.2166	0.860	2.220
0.2250	0.854	2.937
0.2333	0.860	2.831
0.2416	0.860	2.029
0.2500	0.847	2.008
0.2583	0.854	1.771
0.2666	0.847	1.872
0.2750	0.847	2.044
0.2833	0.847	1.827
0.2916	0.854	1.948

001160.0137

0.3000	0.847	1.726
0.3083	0.847	1.721
0.3166	0.854	2.271
0.3250	0.847	2.432
0.3333	0.847	2.493
0.3500	0.847	1.357
0.3666	0.841	1.494
0.3833	0.841	1.382
0.4000	0.841	1.342
0.4166	0.841	1.302
0.4333	0.841	1.271
0.4500	0.835	1.226
0.4666	0.835	1.201
0.4833	0.841	1.176
0.5000	0.835	1.130
0.5166	0.828	1.100
0.5333	0.835	1.070
0.5500	0.835	1.044
0.5666	0.828	1.014
0.5833	0.835	0.994
0.6000	0.822	0.969
0.6166	0.828	0.933
0.6333	0.822	0.913
0.6500	0.822	0.893
0.6666	0.828	0.868
0.6833	0.816	0.847
0.7000	0.822	0.827
0.7166	0.822	0.802
0.7333	0.822	0.782
0.7500	0.816	0.762
0.7666	0.816	0.747
0.7833	0.816	0.726
0.8000	0.816	0.711
0.8166	0.816	0.691
0.8333	0.816	0.671
0.8500	0.810	0.661
0.8666	0.810	0.646
0.8833	0.810	0.630
0.9000	0.810	0.615
0.9166	0.810	0.600
0.9333	0.816	0.585
0.9500	0.803	0.570
0.9666	0.810	0.560
0.9833	0.803	0.550
1.0000	0.803	0.529
1.2000	0.797	0.403
1.4000	0.791	0.317
1.6000	0.784	0.252
1.8000	0.765	0.211
2.0000	0.765	0.171
2.2000	0.753	0.146
2.4000	0.746	0.126
2.6000	0.740	0.111
2.8000	0.734	0.100
3.0000	0.727	0.095
3.2000	0.721	0.090
3.4000	0.715	0.080
3.6000	0.708	0.075
3.8000	0.702	0.070
4.0000	0.702	0.070

001160.0138

4.2000	0.689	0.070
4.4000	0.683	0.065
4.6000	0.677	0.065
4.8000	0.670	0.065
5.0000	0.664	0.060
5.2000	0.664	0.065
5.4000	0.658	0.065
5.6000	0.651	0.065
5.8000	0.639	0.065
6.0000	0.639	0.060
6.2000	0.639	0.065
6.4000	0.632	0.060
6.6000	0.626	0.060
6.8000	0.626	0.055
7.0000	0.620	0.060
7.2000	0.613	0.060
7.4000	0.613	0.055
7.6000	0.601	0.060
7.8000	0.601	0.055
8.0000	0.594	0.055
8.2000	0.588	0.060
8.4000	0.582	0.055
8.6000	0.582	0.055
8.8000	0.575	0.055
9.0000	0.569	0.050
9.2000	0.569	0.055
9.4000	0.569	0.050
9.6000	0.563	0.055
9.8000	0.563	0.060
10.0000	0.550	0.055
12.0000	0.518	0.060
14.0000	0.487	0.060
16.0000	0.461	0.060
18.0000	0.436	0.060
20.0000	0.417	0.065
22.0000	0.392	0.065
24.0000	0.379	0.060
26.0000	0.360	0.070
28.0000	0.348	0.065
30.0000	0.329	0.065
32.0000	0.316	0.065
34.0000	0.310	0.050

001160.0139

SE2000
Environmental Logger
05/24 12:14

Unit# 404 Test 2

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-005	MW-006
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 1 05/23 10:34:21

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.221	-2.215
0.0083	0.107	-1.206
0.0166	0.227	0.535
0.0250	0.499	-1.120
0.0333	0.031	-2.392
0.0416	-0.139	-2.291
0.0500	-0.828	-1.483
0.0583	-0.930	-0.969
0.0666	-0.841	-1.559
0.0750	-0.828	-1.736
0.0833	-0.835	-2.432
0.0916	-0.784	-2.745
0.1000	-0.822	-2.654
0.1083	-0.778	-2.634
0.1166	-0.803	-2.553
0.1250	-0.771	-2.513
0.1333	-0.790	-2.493
0.1416	-0.765	-2.432
0.1500	-0.784	-2.412
0.1583	-0.759	-2.336
0.1666	-0.771	-2.341
0.1750	-0.752	-2.291
0.1833	-0.765	-2.235
0.1916	-0.752	-2.205
0.2000	-0.759	-2.170
0.2083	-0.752	-2.135
0.2166	-0.752	-2.099
0.2250	-0.752	-2.069
0.2333	-0.752	-2.034
0.2416	-0.746	-2.003
0.2500	-0.746	-1.968
0.2583	-0.746	-1.943
0.2666	-0.740	-1.912
0.2750	-0.740	-1.882
0.2833	-0.740	-1.852
0.2916	-0.740	-1.822

001160.0140

0.3000	-0.733	-1.801
0.3083	-0.733	-1.771
0.3166	-0.733	-1.746
0.3250	-0.733	-1.721
0.3333	-0.733	-1.695
0.3500	-0.727	-1.640
0.3666	-0.727	-1.589
0.3833	-0.727	-1.544
0.4000	-0.727	-1.499
0.4166	-0.721	-1.458
0.4333	-0.721	-1.418
0.4500	-0.714	-1.372
0.4666	-0.714	-1.337
0.4833	-0.708	-1.297
0.5000	-0.708	-1.256
0.5166	-0.708	-1.221
0.5333	-0.708	-1.186
0.5500	-0.708	-1.145
0.5666	-0.702	-1.120
0.5833	-0.702	-1.090
0.6000	-0.695	-1.059
0.6166	-0.702	-1.024
0.6333	-0.695	-0.999
0.6500	-0.689	-0.969
0.6666	-0.689	-0.943
0.6833	-0.689	-0.918
0.7000	-0.689	-0.893
0.7166	-0.689	-0.868
0.7333	-0.683	-0.827
0.7500	-0.683	-0.812
0.7666	-0.683	-0.797
0.7833	-0.683	-0.772
0.8000	-0.683	-0.752
0.8166	-0.683	-0.726
0.8333	-0.676	-0.706
0.8500	-0.676	-0.691
0.8666	-0.676	-0.676
0.8833	-0.676	-0.656
0.9000	-0.670	-0.630
0.9166	-0.670	-0.620
0.9333	-0.670	-0.600
0.9500	-0.670	-0.585
0.9666	-0.664	-0.570
0.9833	-0.670	-0.555
1.0000	-0.664	-0.540
1.2000	-0.651	-0.378
1.4000	-0.639	-0.272
1.6000	-0.626	-0.201
1.8000	-0.613	-0.146
2.0000	-0.601	-0.100
2.2000	-0.594	-0.080
2.4000	-0.582	-0.055
2.6000	-0.575	-0.035
2.8000	-0.563	-0.025
3.0000	-0.556	-0.015
3.2000	-0.544	-0.010
3.4000	-0.537	-0.005
3.6000	-0.531	0.000
3.8000	-0.525	0.000
4.0000	-0.512	0.005

001160.0141

4.2000	-0.506	0.005
4.4000	-0.499	0.010
4.6000	-0.487	0.015
4.8000	-0.487	0.015
5.0000	-0.480	0.015
5.2000	-0.474	0.015
5.4000	-0.468	0.015
5.6000	-0.461	0.015
5.8000	-0.449	0.020
6.0000	-0.442	0.020
6.2000	-0.436	0.020
6.4000	-0.436	0.020
6.6000	-0.430	0.020
6.8000	-0.423	0.020
7.0000	-0.417	0.020
7.2000	-0.411	0.020
7.4000	-0.404	0.025
7.6000	-0.404	0.025
7.8000	-0.398	0.025
8.0000	-0.392	0.025
8.2000	-0.385	0.025
8.4000	-0.385	0.020
8.6000	-0.379	0.020
8.8000	-0.373	0.020
9.0000	-0.366	0.025
9.2000	-0.366	0.025
9.4000	-0.360	0.025
9.6000	-0.354	0.025
9.8000	-0.354	0.025
10.0000	-0.348	0.025
12.0000	-0.310	0.030
14.0000	-0.272	0.025
16.0000	-0.246	0.030
18.0000	-0.215	0.030
20.0000	-0.189	0.025
22.0000	-0.170	0.025
24.0000	-0.158	0.030
26.0000	-0.139	0.035
28.0000	-0.126	0.030
30.0000	-0.107	0.035

SE2000
Environmental Logger
05/26 13:04

Unit# 404 Test 15

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-006
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 0 05/26 08:16:02

Elapsed Time	INPUT 1
0.0000	0.009
0.0083	1.444
0.0166	1.778
0.0250	2.623
0.0333	2.459
0.0416	2.333
0.0500	1.586
0.0583	1.305
0.0666	1.469
0.0750	1.582
0.0833	2.081
0.0916	1.444
0.1000	1.415
0.1083	1.368
0.1166	1.340
0.1250	1.321
0.1333	1.299
0.1416	1.283
0.1500	1.261
0.1583	1.242
0.1666	1.223
0.1750	1.204
0.1833	1.185
0.1916	1.169
0.2000	1.150
0.2083	1.135
0.2166	1.116
0.2250	1.100
0.2333	1.081
0.2416	1.068
0.2500	1.053
0.2583	1.034
0.2666	1.018
0.2750	1.005
0.2833	0.990
0.2916	0.977

001160.0143

0.3000	0.961
0.3083	0.949
0.3166	0.933
0.3250	0.920
0.3333	0.908
0.3500	0.879
0.3666	0.854
0.3833	0.832
0.4000	0.807
0.4166	0.785
0.4333	0.763
0.4500	0.740
0.4666	0.722
0.4833	0.699
0.5000	0.681
0.5166	0.665
0.5333	0.646
0.5500	0.624
0.5666	0.618
0.5833	0.602
0.6000	0.592
0.6166	0.580
0.6333	0.567
0.6500	0.548
0.6666	0.536
0.6833	0.520
0.7000	0.507
0.7166	0.495
0.7333	0.482
0.7500	0.469
0.7666	0.457
0.7833	0.444
0.8000	0.431
0.8166	0.422
0.8333	0.409
0.8500	0.400
0.8666	0.390
0.8833	0.381
0.9000	0.372
0.9166	0.362
0.9333	0.353
0.9500	0.343
0.9666	0.334
0.9833	0.327
1.0000	0.321
1.2000	0.236
1.4000	0.179
1.6000	0.138
1.8000	0.110
2.0000	0.088
2.2000	0.072
2.4000	0.059
2.6000	0.050
2.8000	0.037
3.0000	0.040

001160.0144

SE2000
Environmental Logger
05/26 13:06

Unit# 404 Test 15

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-006
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 1 05/26 08:19:08

Elapsed Time	INPUT 1
0.0000	-0.353
0.0083	-1.090
0.0166	-1.018
0.0250	-1.005
0.0333	-1.522
0.0416	-1.702
0.0500	-1.645
0.0583	-1.642
0.0666	-1.566
0.0750	-1.538
0.0833	-1.538
0.0916	-1.510
0.1000	-1.466
0.1083	-1.437
0.1166	-1.425
0.1250	-1.409
0.1333	-1.384
0.1416	-1.355
0.1500	-1.349
0.1583	-1.317
0.1666	-1.295
0.1750	-1.273
0.1833	-1.254
0.1916	-1.239
0.2000	-1.220
0.2083	-1.204
0.2166	-1.188
0.2250	-1.172
0.2333	-1.153
0.2416	-1.138
0.2500	-1.119
0.2583	-1.100
0.2666	-1.084
0.2750	-1.065
0.2833	-1.053
0.2916	-1.034

001160.0145

0.3000	-1.018
0.3083	-1.002
0.3166	-0.986
0.3250	-0.974
0.3333	-0.958
0.3500	-0.930
0.3666	-0.901
0.3833	-0.873
0.4000	-0.848
0.4166	-0.822
0.4333	-0.797
0.4500	-0.772
0.4666	-0.750
0.4833	-0.731
0.5000	-0.706
0.5166	-0.687
0.5333	-0.665
0.5500	-0.643
0.5666	-0.624
0.5833	-0.605
0.6000	-0.589
0.6166	-0.570
0.6333	-0.554
0.6500	-0.542
0.6666	-0.523
0.6833	-0.507
0.7000	-0.495
0.7166	-0.479
0.7333	-0.466
0.7500	-0.454
0.7666	-0.441
0.7833	-0.425
0.8000	-0.416
0.8166	-0.403
0.8333	-0.390
0.8500	-0.375
0.8666	-0.368
0.8833	-0.359
0.9000	-0.349
0.9166	-0.334
0.9333	-0.331
0.9500	-0.321
0.9666	-0.312
0.9833	-0.302
1.0000	-0.293
1.2000	-0.208
1.4000	-0.148
1.6000	-0.107
1.8000	-0.075
2.0000	-0.053
2.2000	-0.037
2.4000	-0.028

001160.0146

SE2000
Environmental Logger
05/24 12:17

Unit# 404 Test 3

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-007	MW-008
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 0 05/23 11:20:54

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	-0.191
0.0083	0.000	4.542
0.0166	0.000	2.508
0.0250	0.000	3.492
0.0333	0.000	3.750
0.0416	0.025	3.623
0.0500	0.626	3.502
0.0583	1.088	2.488
0.0666	1.195	2.291
0.0750	0.347	2.296
0.0833	0.841	2.256
0.0916	0.860	2.210
0.1000	0.575	2.165
0.1083	0.727	2.129
0.1166	0.619	2.084
0.1250	0.607	2.049
0.1333	0.594	2.008
0.1416	0.562	1.973
0.1500	0.550	1.938
0.1583	0.531	1.902
0.1666	0.518	1.867
0.1750	0.499	1.832
0.1833	0.480	1.796
0.1916	0.468	1.761
0.2000	0.449	1.731
0.2083	0.436	1.700
0.2166	0.430	1.670
0.2250	0.417	1.635
0.2333	0.404	1.610
0.2416	0.398	1.579
0.2500	0.392	1.549
0.2583	0.379	1.519
0.2666	0.379	1.494
0.2750	0.366	1.468
0.2833	0.366	1.443
0.2916	0.360	1.418

0.3000	0.354	1.393
0.3083	0.347	1.367
0.3166	0.341	1.342
0.3250	0.341	1.317
0.3333	0.335	1.297
0.3500	0.328	1.251
0.3666	0.322	1.206
0.3833	0.316	1.160
0.4000	0.309	1.125
0.4166	0.303	1.085
0.4333	0.297	1.049
0.4500	0.297	1.009
0.4666	0.290	0.979
0.4833	0.290	0.943
0.5000	0.284	0.913
0.5166	0.278	0.883
0.5333	0.271	0.852
0.5500	0.271	0.822
0.5666	0.271	0.802
0.5833	0.265	0.772
0.6000	0.265	0.747
0.6166	0.259	0.721
0.6333	0.259	0.701
0.6500	0.253	0.676
0.6666	0.253	0.656
0.6833	0.253	0.635
0.7000	0.253	0.615
0.7166	0.246	0.595
0.7333	0.246	0.575
0.7500	0.246	0.555
0.7666	0.246	0.540
0.7833	0.240	0.529
0.8000	0.240	0.509
0.8166	0.240	0.494
0.8333	0.240	0.479
0.8500	0.234	0.469
0.8666	0.234	0.449
0.8833	0.234	0.439
0.9000	0.234	0.423
0.9166	0.234	0.413
0.9333	0.234	0.403
0.9500	0.234	0.388
0.9666	0.227	0.378
0.9833	0.227	0.368
1.0000	0.227	0.358
1.2000	0.215	0.257
1.4000	0.208	0.186
1.6000	0.202	0.151
1.8000	0.196	0.121
2.0000	0.189	0.095
2.2000	0.183	0.085
2.4000	0.183	0.075
2.6000	0.177	0.070
2.8000	0.170	0.060
3.0000	0.164	0.060
3.2000	0.158	0.060
3.4000	0.158	0.050
3.6000	0.151	0.055
3.8000	0.151	0.060
4.0000	0.145	0.050

001160.0148

4.2000	0.145	0.050
4.4000	0.139	0.050
4.6000	0.139	0.050
4.8000	0.132	0.050
5.0000	0.132	0.050
5.2000	0.126	0.055
5.4000	0.120	0.055
5.6000	0.120	0.055
5.8000	0.120	0.055
6.0000	0.120	0.055
6.2000	0.113	0.055
6.4000	0.113	0.171

SE2000
Environmental Logger
05/24 12:21

Unit# 404 Test 3

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-007	MW-008
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 1 05/23 11:27:24

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.120	-1.953
0.0083	0.132	-1.731
0.0166	0.189	-1.393
0.0250	0.031	-1.847
0.0333	0.006	-1.938
0.0416	-0.189	-1.191
0.0500	-0.132	-2.175
0.0583	-0.632	-2.649
0.0666	-0.872	-2.538
0.0750	-1.043	-2.447
0.0833	-0.973	-2.478
0.0916	-0.942	-2.377
0.1000	-0.904	-2.316
0.1083	-0.891	-2.316
0.1166	-0.866	-2.246
0.1250	-0.834	-2.210
0.1333	-0.822	-2.165
0.1416	-0.796	-2.114
0.1500	-0.777	-2.069
0.1583	-0.758	-2.029
0.1666	-0.746	-1.993
0.1750	-0.727	-1.943
0.1833	-0.714	-1.917
0.1916	-0.702	-1.882
0.2000	-0.689	-1.832
0.2083	-0.676	-1.796
0.2166	-0.664	-1.761
0.2250	-0.651	-1.726
0.2333	-0.645	-1.690
0.2416	-0.626	-1.655
0.2500	-0.613	-1.625
0.2583	-0.607	-1.589
0.2666	-0.594	-1.559
0.2750	-0.581	-1.529
0.2833	-0.575	-1.499
0.2916	-0.562	-1.468

001160.0150

0.3000	-0.550	-1.438
0.3083	-0.543	-1.413
0.3166	-0.531	-1.382
0.3250	-0.524	-1.357
0.3333	-0.512	-1.327
0.3500	-0.493	-1.276
0.3666	-0.474	-1.226
0.3833	-0.461	-1.181
0.4000	-0.449	-1.135
0.4166	-0.430	-1.095
0.4333	-0.411	-1.054
0.4500	-0.398	-1.009
0.4666	-0.392	-0.974
0.4833	-0.373	-0.933
0.5000	-0.366	-0.903
0.5166	-0.354	-0.863
0.5333	-0.347	-0.832
0.5500	-0.335	-0.797
0.5666	-0.328	-0.772
0.5833	-0.322	-0.741
0.6000	-0.316	-0.711
0.6166	-0.309	-0.686
0.6333	-0.303	-0.656
0.6500	-0.297	-0.635
0.6666	-0.290	-0.610
0.6833	-0.290	-0.590
0.7000	-0.278	-0.565
0.7166	-0.278	-0.545
0.7333	-0.278	-0.524
0.7500	-0.278	-0.504
0.7666	-0.271	-0.484
0.7833	-0.271	-0.464
0.8000	-0.265	-0.449
0.8166	-0.265	-0.429
0.8333	-0.265	-0.413
0.8500	-0.265	-0.398
0.8666	-0.265	-0.383
0.8833	-0.265	-0.368
0.9000	-0.259	-0.353
0.9166	-0.259	-0.343
0.9333	-0.259	-0.328
0.9500	-0.252	-0.317
0.9666	-0.259	-0.302
0.9833	-0.252	-0.292
1.0000	-0.252	-0.277
1.2000	-0.240	-0.171
1.4000	-0.234	-0.095
1.6000	-0.227	-0.050
1.8000	-0.221	-0.025
2.0000	-0.215	0.005
2.2000	-0.208	0.010
2.4000	-0.208	0.020
2.6000	-0.208	0.030
2.8000	-0.202	0.030
3.0000	-0.196	0.040
3.2000	-0.189	0.040
3.4000	-0.189	0.040
3.6000	-0.189	0.040
3.8000	-0.189	0.045
4.0000	-0.183	0.045

4.2000	-0.183	0.045
4.4000	-0.177	0.045
4.6000	-0.177	0.050
4.8000	-0.177	0.050
5.0000	-0.177	0.050
5.2000	-0.170	0.050
5.4000	-0.170	0.050
5.6000	-0.170	0.050
5.8000	-0.164	0.050
6.0000	-0.164	0.050
6.2000	-0.164	0.050
6.4000	-0.164	0.050
6.6000	-0.164	0.050
6.8000	-0.164	0.050
7.0000	-0.158	0.055
7.2000	-0.158	0.055
7.4000	-0.158	0.050
7.6000	-0.158	0.050
7.8000	-0.151	0.050
8.0000	-0.151	0.055
8.2000	-0.151	0.060
8.4000	-0.151	0.060
8.6000	-0.151	0.055
8.8000	-0.151	0.055
9.0000	-0.151	0.050
9.2000	-0.145	0.055
9.4000	-0.145	0.050
9.6000	-0.145	0.050
9.8000	-0.145	0.055
10.0000	-0.145	0.055
12.0000	-0.132	0.060
14.0000	-0.132	0.060
16.0000	-0.132	0.055
18.0000	-0.120	0.055
20.0000	-0.120	0.060
22.0000	-0.113	0.060
24.0000	-0.113	0.065
26.0000	-0.107	0.060
28.0000	-0.107	0.060

001160.0152

SE2000
Environmental Logger
05/26 13:09

Unit# 404 Test 16

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-008
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 0 05/26 08:45:53

Elapsed Time	INPUT 1
0.0000	0.012
0.0083	2.147
0.0166	1.800
0.0250	2.077
0.0333	1.983
0.0416	1.116
0.0500	1.450
0.0583	1.504
0.0666	1.494
0.0750	1.431
0.0833	1.406
0.0916	1.381
0.1000	1.352
0.1083	1.327
0.1166	1.299
0.1250	1.273
0.1333	1.248
0.1416	1.223
0.1500	1.201
0.1583	1.176
0.1666	1.154
0.1750	1.131
0.1833	1.109
0.1916	1.087
0.2000	1.065
0.2083	1.043
0.2166	1.027
0.2250	1.005
0.2333	0.986
0.2416	0.967
0.2500	0.949
0.2583	0.930
0.2666	0.914
0.2750	0.892
0.2833	0.876
0.2916	0.860

001160.0153

0.3000	0.841
0.3083	0.826
0.3166	0.810
0.3250	0.794
0.3333	0.781
0.3500	0.753
0.3666	0.725
0.3833	0.696
0.4000	0.671
0.4166	0.646
0.4333	0.621
0.4500	0.595
0.4666	0.577
0.4833	0.554
0.5000	0.536
0.5166	0.517
0.5333	0.498
0.5500	0.479
0.5666	0.463
0.5833	0.444
0.6000	0.428
0.6166	0.413
0.6333	0.400
0.6500	0.384
0.6666	0.372
0.6833	0.356
0.7000	0.346
0.7166	0.334
0.7333	0.324
0.7500	0.318
0.7666	0.308
0.7833	0.299
0.8000	0.290
0.8166	0.280
0.8333	0.271
0.8500	0.264
0.8666	0.258
0.8833	0.249
0.9000	0.242
0.9166	0.233
0.9333	0.223
0.9500	0.217
0.9666	0.211
0.9833	0.204
1.0000	0.198
1.2000	0.129
1.4000	0.085
1.6000	0.056
1.8000	0.037
2.0000	0.025
2.2000	0.018
2.4000	0.025
2.6000	0.012

001160.0154

SE2000
Environmental Logger
05/26 13:10

Unit# 404 Test 16

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-008
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 1 05/26 08:48:36

Elapsed Time	INPUT 1
0.0000	-0.066
0.0083	0.343
0.0166	-0.996
0.0250	4.064
0.0333	-1.456
0.0416	-1.696
0.0500	-1.715
0.0583	-1.724
0.0666	-1.670
0.0750	-1.721
0.0833	-1.576
0.0916	-1.522
0.1000	-1.529
0.1083	-1.475
0.1166	-1.431
0.1250	-1.399
0.1333	-1.371
0.1416	-1.339
0.1500	-1.311
0.1583	-1.286
0.1666	-1.257
0.1750	-1.232
0.1833	-1.204
0.1916	-1.179
0.2000	-1.157
0.2083	-1.131
0.2166	-1.112
0.2250	-1.090
0.2333	-1.065
0.2416	-1.046
0.2500	-1.024
0.2583	-1.002
0.2666	-0.983
0.2750	-0.964
0.2833	-0.945
0.2916	-0.926

001160.0155

0.3000	-0.908
0.3083	-0.889
0.3166	-0.873
0.3250	-0.857
0.3333	-0.838
0.3500	-0.807
0.3666	-0.775
0.3833	-0.744
0.4000	-0.715
0.4166	-0.690
0.4333	-0.662
0.4500	-0.636
0.4666	-0.614
0.4833	-0.589
0.5000	-0.567
0.5166	-0.545
0.5333	-0.526
0.5500	-0.507
0.5666	-0.485
0.5833	-0.469
0.6000	-0.450
0.6166	-0.435
0.6333	-0.419
0.6500	-0.403
0.6666	-0.387
0.6833	-0.375
0.7000	-0.362
0.7166	-0.349
0.7333	-0.334
0.7500	-0.324
0.7666	-0.312
0.7833	-0.302
0.8000	-0.290
0.8166	-0.280
0.8333	-0.268
0.8500	-0.261
0.8666	-0.249
0.8833	-0.242
0.9000	-0.233
0.9166	-0.227
0.9333	-0.217
0.9500	-0.211
0.9666	-0.204
0.9833	-0.198
1.0000	-0.192
1.2000	-0.129
1.4000	-0.088
1.6000	-0.063
1.8000	-0.047
2.0000	-0.034
2.2000	-0.028
2.4000	-0.025
2.6000	-0.022
2.8000	-0.018
3.0000	-0.015
3.2000	-0.015
3.4000	-0.015
3.6000	-0.015
3.8000	-0.015

SE2000
Environmental Logger
05/24 12:24

Unit# 404 Test 4

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~011~~ 009	MW-~~012~~ 010
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 0 05/23 12:15:13

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.715	-0.772
0.0083	0.715	-0.736
0.0166	0.715	2.114
0.0250	0.841	2.902
0.0333	1.506	2.579
0.0416	1.588	2.478
0.0500	1.696	1.165
0.0583	2.057	1.569
0.0666	2.437	1.398
0.0750	2.563	1.372
0.0833	1.829	1.312
0.0916	1.196	1.271
0.1000	1.613	1.241
0.1083	1.746	1.216
0.1166	1.474	1.181
0.1250	1.531	1.145
0.1333	1.632	1.110
0.1416	1.519	1.085
0.1500	1.569	1.059
0.1583	1.576	1.029
0.1666	1.531	1.004
0.1750	1.569	0.974
0.1833	1.550	0.948
0.1916	1.550	0.928
0.2000	1.563	0.898
0.2083	1.550	0.878
0.2166	1.550	0.852
0.2250	1.557	0.827
0.2333	1.544	0.807
0.2416	1.550	0.782
0.2500	1.544	0.762
0.2583	1.550	0.741
0.2666	1.544	0.721
0.2750	1.544	0.701
0.2833	1.538	0.681
0.2916	1.544	0.666

001160.0157

0.3000	1.538	0.641
0.3083	1.544	0.620
0.3166	1.538	0.605
0.3250	1.544	0.585
0.3333	1.538	0.570
0.3500	1.531	0.535
0.3666	1.538	0.499
0.3833	1.538	0.464
0.4000	1.531	0.434
0.4166	1.531	0.403
0.4333	1.531	0.373
0.4500	1.525	0.343
0.4666	1.531	0.317
0.4833	1.525	0.287
0.5000	1.519	0.262
0.5166	1.525	0.237
0.5333	1.512	0.211
0.5500	1.525	0.186
0.5666	1.519	0.166
0.5833	1.512	0.141
0.6000	1.512	0.121
0.6166	1.512	0.100
0.6333	1.525	0.080
0.6500	1.506	0.060
0.6666	1.506	0.040
0.6833	1.512	0.020
0.7000	1.506	0.000
0.7166	1.500	-0.015
0.7333	1.506	-0.030
0.7500	1.512	-0.050
0.7666	1.506	-0.065
0.7833	1.500	-0.080
0.8000	1.506	-0.095
0.8166	1.506	-0.111
0.8333	1.500	-0.126
0.8500	1.493	-0.136
0.8666	1.500	-0.151
0.8833	1.493	-0.166
0.9000	1.487	-0.181
0.9166	1.487	-0.191
0.9333	1.493	-0.201
0.9500	1.481	-0.217
0.9666	1.493	-0.227
0.9833	1.487	-0.237
1.0000	1.474	-0.247
1.2000	1.474	-0.363
1.4000	1.462	-0.439
1.6000	1.449	-0.499
1.8000	1.443	-0.545
2.0000	1.436	-0.580
2.2000	1.430	-0.600
2.4000	1.424	-0.620
2.6000	1.411	-0.635
2.8000	1.405	-0.646
3.0000	1.398	-0.656
3.2000	1.405	-0.661
3.4000	1.379	-0.666
3.6000	1.386	-0.666
3.8000	1.367	-0.671
4.0000	1.360	-0.676

001160.0158

4.2000	1.373	-0.681
4.4000	1.360	-0.681
4.6000	1.348	-0.681
4.8000	1.341	-0.686
5.0000	1.335	-0.686
5.2000	1.329	-0.686
5.4000	1.322	-0.686
5.6000	1.316	-0.686
5.8000	1.316	-0.686
6.0000	1.316	-0.691
6.2000	1.310	-0.691
6.4000	1.316	-0.686
6.6000	1.297	-0.691
6.8000	1.297	-0.686
7.0000	1.284	-0.691
7.2000	1.291	-0.691
7.4000	1.284	-0.691
7.6000	1.278	-0.691
7.8000	1.278	-0.691
8.0000	1.272	-0.691
8.2000	1.272	-0.691
8.4000	1.265	-0.696
8.6000	1.265	-0.691
8.8000	1.265	-0.691
9.0000	1.259	-0.691
9.2000	1.253	-0.691
9.4000	1.253	-0.691
9.6000	1.253	-0.691
9.8000	1.253	-0.686
10.0000	1.246	-0.691
12.0000	1.221	-0.686
14.0000	1.202	-0.691
16.0000	1.189	-0.691
18.0000	1.170	-0.696
20.0000	1.164	-0.696
22.0000	1.145	-0.686
24.0000	1.132	-0.691
26.0000	1.126	-0.691
28.0000	1.120	-0.691
30.0000	1.113	-0.691
32.0000	1.113	-0.696
34.0000	1.101	-0.691
36.0000	1.094	-0.691
38.0000	1.094	-0.691
40.0000	1.088	-0.686
42.0000	1.088	-0.691
44.0000	1.088	-0.691

001160.0159

SE2000
Environmental Logger
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Unit# 404 Test 4

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~011~~ DP 009	MW-~~012~~ DP 010
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 1 05/23 12:59:48

Elapsed Time	INPUT 1	INPUT 2
0.0000	1.088	-1.448
0.0083	1.088	-2.962
0.0166	1.088	-3.432
0.0250	1.094	-2.962
0.0333	1.088	-3.432
0.0416	1.063	-3.411
0.0500	1.056	-3.300
0.0583	1.037	-3.250
0.0666	0.867	-3.230
0.0750	1.075	-3.179
0.0833	0.613	-3.154
0.0916	0.575	-3.094
0.1000	0.949	-3.068
0.1083	0.601	-3.038
0.1166	0.386	-3.023
0.1250	0.506	-3.003
0.1333	-0.006	-2.972
0.1416	-0.386	-2.952
0.1500	-0.012	-2.927
0.1583	-0.196	-2.917
0.1666	-0.101	-2.907
0.1750	-0.107	-2.866
0.1833	-0.113	-2.846
0.1916	-0.075	-2.826
0.2000	-0.101	-2.811
0.2083	-0.069	-2.791
0.2166	-0.082	-2.776
0.2250	-0.075	-2.755
0.2333	-0.075	-2.735
0.2416	-0.063	-2.720
0.2500	-0.063	-2.700
0.2583	-0.056	-2.685
0.2666	-0.050	-2.664
0.2750	-0.050	-2.649
0.2833	-0.050	-2.634
0.2916	-0.044	-2.619

001160.0160

0.3000	-0.044	-2.604
0.3083	-0.037	-2.589
0.3166	-0.031	-2.574
0.3250	-0.031	-2.558
0.3333	-0.031	-2.543
0.3500	-0.025	-2.513
0.3666	-0.018	-2.488
0.3833	-0.012	-2.458
0.4000	-0.012	-2.427
0.4166	-0.006	-2.402
0.4333	0.000	-2.372
0.4500	0.000	-2.352
0.4666	0.006	-2.326
0.4833	0.012	-2.301
0.5000	0.018	-2.276
0.5166	0.018	-2.251
0.5333	0.025	-2.230
0.5500	0.025	-2.205
0.5666	0.031	-2.185
0.5833	0.037	-2.165
0.6000	0.037	-2.140
0.6166	0.037	-2.119
0.6333	0.044	-2.099
0.6500	0.037	-2.079
0.6666	0.056	-2.054
0.6833	0.056	-2.039
0.7000	0.044	-2.013
0.7166	0.069	-1.998
0.7333	0.063	-1.978
0.7500	0.069	-1.963
0.7666	0.069	-1.943
0.7833	0.069	-1.928
0.8000	0.088	-1.907
0.8166	0.082	-1.887
0.8333	0.082	-1.872
0.8500	0.082	-1.857
0.8666	0.088	-1.842
0.8833	0.088	-1.822
0.9000	0.094	-1.806
0.9166	0.094	-1.791
0.9333	0.094	-1.776
0.9500	0.107	-1.761
0.9666	0.101	-1.746
0.9833	0.101	-1.731
1.0000	0.107	-1.716
1.2000	0.132	-1.564
1.4000	0.164	-1.428
1.6000	0.183	-1.322
1.8000	0.208	-1.231
2.0000	0.227	-1.155
2.2000	0.240	-1.095
2.4000	0.259	-1.039
2.6000	0.278	-0.994
2.8000	0.297	-0.953
3.0000	0.310	-0.923
3.2000	0.329	-0.898
3.4000	0.341	-0.873
3.6000	0.360	-0.853
3.8000	0.373	-0.837
4.0000	0.386	-0.822

001160.0161

4.2000	0.392	-0.802
4.4000	0.411	-0.792
4.6000	0.417	-0.787
4.8000	0.430	-0.777
5.0000	0.442	-0.772
5.2000	0.455	-0.762
5.4000	0.461	-0.757
5.6000	0.468	-0.752
5.8000	0.480	-0.747
6.0000	0.493	-0.736
6.2000	0.499	-0.736
6.4000	0.512	-0.731
6.6000	0.518	-0.731
6.8000	0.525	-0.731
7.0000	0.531	-0.726
7.2000	0.544	-0.726
7.4000	0.550	-0.716
7.6000	0.563	-0.716
7.8000	0.569	-0.716
8.0000	0.569	-0.716
8.2000	0.575	-0.716
8.4000	0.588	-0.716
8.6000	0.594	-0.711
8.8000	0.601	-0.706
9.0000	0.607	-0.706
9.2000	0.613	-0.706
9.4000	0.620	-0.706
9.6000	0.626	-0.706
9.8000	0.626	-0.711
10.0000	0.632	-0.711
12.0000	0.683	-0.701
14.0000	0.727	-0.701
16.0000	0.765	-0.701
18.0000	0.797	-0.701
20.0000	0.822	-0.701
22.0000	0.848	-0.696
24.0000	0.867	-0.696
26.0000	0.886	-0.701
28.0000	0.892	-0.696
30.0000	0.905	-0.696
32.0000	0.924	-0.691
34.0000	0.930	-0.701

001160.0162

SE2000
Environmental Logger
05/26 13:12

Unit# 404 Test 17

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-010
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 0 05/26 09:11:36

Elapsed Time	INPUT 1
0.0000	0.000
0.0083	-0.003
0.0166	0.958
0.0250	1.428
0.0333	1.891
0.0416	1.980
0.0500	1.384
0.0583	1.753
0.0666	1.898
0.0750	1.954
0.0833	2.011
0.0916	1.232
0.1000	1.248
0.1083	1.242
0.1166	1.210
0.1250	1.201
0.1333	1.182
0.1416	1.163
0.1500	1.144
0.1583	1.122
0.1666	1.106
0.1750	1.087
0.1833	1.071
0.1916	1.053
0.2000	1.037
0.2083	1.021
0.2166	1.005
0.2250	0.989
0.2333	0.974
0.2416	0.958
0.2500	0.942
0.2583	0.930
0.2666	0.914
0.2750	0.901
0.2833	0.885
0.2916	0.873

001160.0163

0.3000	0.857
0.3083	0.844
0.3166	0.835
0.3250	0.822
0.3333	0.807
0.3500	0.781
0.3666	0.762
0.3833	0.740
0.4000	0.718
0.4166	0.696
0.4333	0.677
0.4500	0.658
0.4666	0.640
0.4833	0.621
0.5000	0.605
0.5166	0.586
0.5333	0.570
0.5500	0.554
0.5666	0.539
0.5833	0.526
0.6000	0.510
0.6166	0.498
0.6333	0.482
0.6500	0.469
0.6666	0.457
0.6833	0.444
0.7000	0.431
0.7166	0.419
0.7333	0.409
0.7500	0.397
0.7666	0.387
0.7833	0.378
0.8000	0.368
0.8166	0.359
0.8333	0.349
0.8500	0.340
0.8666	0.331
0.8833	0.321
0.9000	0.312
0.9166	0.302
0.9333	0.296
0.9500	0.290
0.9666	0.280
0.9833	0.277
1.0000	0.267
1.2000	0.198
1.4000	0.148
1.6000	0.116
1.8000	0.091
2.0000	0.072
2.2000	0.059
2.4000	0.047
2.6000	0.040
2.8000	0.034
3.0000	0.028
3.2000	0.022
3.4000	0.018

001160.0164

SE2000
Environmental Logger
05/26 13:13

Unit# 404 Test 17

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-010
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 1 05/26 09:15:13

Elapsed Time	INPUT 1
0.0000	0.022
0.0083	-0.772
0.0166	-1.324
0.0250	-2.225
0.0333	-0.529
0.0416	-1.443
0.0500	-1.639
0.0583	-1.598
0.0666	-1.563
0.0750	-1.522
0.0833	-1.481
0.0916	-1.481
0.1000	-1.440
0.1083	-1.421
0.1166	-1.406
0.1250	-1.371
0.1333	-1.349
0.1416	-1.349
0.1500	-1.349
0.1583	-1.324
0.1666	-1.298
0.1750	-1.279
0.1833	-1.261
0.1916	-1.251
0.2000	-1.242
0.2083	-1.232
0.2166	-1.216
0.2250	-1.207
0.2333	-1.188
0.2416	-1.175
0.2500	-1.166
0.2583	-1.157
0.2666	-1.144
0.2750	-1.198
0.2833	-1.087
0.2916	-1.122

001160.0165

0.3000	-1.109
0.3083	-1.103
0.3166	-1.084
0.3250	-1.075
0.3333	-1.065
0.3500	-1.043
0.3666	-1.021
0.3833	-1.002
0.4000	-0.983
0.4166	-0.964
0.4333	-0.945
0.4500	-0.926
0.4666	-0.907
0.4833	-0.892
0.5000	-0.879
0.5166	-0.863
0.5333	-0.851
0.5500	-0.838
0.5666	-0.822
0.5833	-0.813
0.6000	-0.800
0.6166	-0.788
0.6333	-0.775
0.6500	-0.762
0.6666	-0.750
0.6833	-0.740
0.7000	-0.728
0.7166	-0.715
0.7333	-0.706
0.7500	-0.690
0.7666	-0.680
0.7833	-0.668
0.8000	-0.655
0.8166	-0.646
0.8333	-0.633
0.8500	-0.621
0.8666	-0.611
0.8833	-0.602
0.9000	-0.589
0.9166	-0.580
0.9333	-0.570
0.9500	-0.558
0.9666	-0.548
0.9833	-0.542
1.0000	-0.529
1.2000	-0.431
1.4000	-0.353
1.6000	-0.293
1.8000	-0.242
2.0000	-0.204
2.2000	-0.170
2.4000	-0.145
2.6000	-0.126
2.8000	-0.110
3.0000	-0.094
3.2000	-0.085
3.4000	-0.075
3.6000	-0.066
3.8000	-0.059
4.0000	-0.053

001160.0166

SE2000
Environmental Logger
05/24 12:30

Unit# 404 Test 5

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~013~~ 011 BP	MW-~~014~~ 012 BP
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 0 05/23 14:31:39

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.607	0.621
0.0083	-0.613	2.476
0.0166	-0.348	1.867
0.0250	0.012	2.163
0.0333	0.360	2.239
0.0416	1.120	2.084
0.0500	1.525	1.671
0.0583	1.316	1.372
0.0666	-0.360	1.312
0.0750	-0.405	1.277
0.0833	0.575	1.249
0.0916	0.215	1.211
0.1000	-0.056	1.189
0.1083	0.341	1.160
0.1166	0.170	1.141
0.1250	0.101	1.107
0.1333	0.259	1.081
0.1416	0.132	1.059
0.1500	0.177	1.037
0.1583	0.196	1.009
0.1666	0.139	0.987
0.1750	0.183	0.965
0.1833	0.158	0.943
0.1916	0.164	0.924
0.2000	0.170	0.898
0.2083	0.151	0.879
0.2166	0.158	0.861
0.2250	0.158	0.842
0.2333	0.158	0.823
0.2416	0.164	0.801
0.2500	0.151	0.785
0.2583	0.158	0.769
0.2666	0.158	0.750
0.2750	0.145	0.734
0.2833	0.158	0.715
0.2916	0.158	0.700

001160.0167

0.3000	0.145	0.687
0.3083	0.145	0.671
0.3166	0.151	0.656
0.3250	0.145	0.640
0.3333	0.145	0.624
0.3500	0.139	0.599
0.3666	0.145	0.574
0.3833	0.139	0.548
0.4000	0.139	0.523
0.4166	0.139	0.501
0.4333	0.139	0.482
0.4500	0.132	0.460
0.4666	0.132	0.441
0.4833	0.132	0.422
0.5000	0.126	0.403
0.5166	0.120	0.387
0.5333	0.120	0.369
0.5500	0.126	0.353
0.5666	0.126	0.340
0.5833	0.120	0.324
0.6000	0.113	0.309
0.6166	0.113	0.299
0.6333	0.113	0.287
0.6500	0.113	0.274
0.6666	0.120	0.264
0.6833	0.107	0.252
0.7000	0.107	0.242
0.7166	0.107	0.233
0.7333	0.107	0.223
0.7500	0.107	0.214
0.7666	0.107	0.205
0.7833	0.101	0.198
0.8000	0.107	0.192
0.8166	0.101	0.182
0.8333	0.094	0.176
0.8500	0.094	0.167
0.8666	0.088	0.164
0.8833	0.094	0.157
0.9000	0.094	0.151
0.9166	0.088	0.145
0.9333	0.101	0.141
0.9500	0.088	0.135
0.9666	0.088	0.132
0.9833	0.088	0.126
1.0000	0.088	0.123
1.2000	0.075	0.078
1.4000	0.056	0.050
1.6000	0.037	0.034
1.8000	0.025	0.022
2.0000	0.012	0.012
2.2000	0.000	0.009
2.4000	-0.012	0.006
2.6000	-0.031	0.003
2.8000	-0.037	0.003
3.0000	-0.050	0.000
3.2000	-0.056	0.000
3.4000	-0.075	0.000
3.6000	-0.075	0.003
3.8000	-0.088	0.003
4.0000	-0.101	0.003

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4.2000	-0.113	0.003
4.4000	-0.126	0.006
4.6000	-0.139	0.006
4.8000	-0.145	0.006
5.0000	-0.151	0.009
5.2000	-0.164	0.009
5.4000	-0.170	0.006
5.6000	-0.177	0.006
5.8000	-0.189	0.006
6.0000	-0.196	0.003
6.2000	-0.202	0.000
6.4000	-0.208	0.000
6.6000	-0.221	0.003
6.8000	-0.221	0.003
7.0000	-0.234	0.003
7.2000	-0.234	0.003
7.4000	-0.246	0.006
7.6000	-0.253	0.003
7.8000	-0.259	0.003
8.0000	-0.265	0.003
8.2000	-0.272	0.003
8.4000	-0.278	0.003
8.6000	-0.284	0.003
8.8000	-0.291	0.006
9.0000	-0.297	0.003
9.2000	-0.303	0.006
9.4000	-0.297	0.009
9.6000	-0.303	0.009
9.8000	-0.310	0.006
10.0000	-0.316	0.006
12.0000	-0.367	0.006
14.0000	-0.411	0.009
16.0000	-0.443	0.009
18.0000	-0.480	0.012

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SE2000
Environmental Logger
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Unit# 404 Test 5

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~013~~ GP 011	MW-~~014~~ GP 012
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 1 05/23 14:51:12

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.487	-1.230
0.0083	-1.025	-2.500
0.0166	-0.405	-3.033
0.0250	-0.727	-1.548
0.0333	-1.398	-1.677
0.0416	-1.240	-1.652
0.0500	-1.006	-1.551
0.0583	-1.626	-1.498
0.0666	-1.860	-1.428
0.0750	-1.759	-1.403
0.0833	-1.569	-1.394
0.0916	-1.797	-1.353
0.1000	-1.569	-1.296
0.1083	-1.708	-1.274
0.1166	-1.632	-1.248
0.1250	-1.632	-1.201
0.1333	-1.657	-1.192
0.1416	-1.600	-1.160
0.1500	-1.645	-1.129
0.1583	-1.607	-1.100
0.1666	-1.619	-1.069
0.1750	-1.619	-1.047
0.1833	-1.607	-1.025
0.1916	-1.613	-1.006
0.2000	-1.600	-0.974
0.2083	-1.607	-0.952
0.2166	-1.600	-0.930
0.2250	-1.594	-0.908
0.2333	-1.600	-0.886
0.2416	-1.594	-0.861
0.2500	-1.594	-0.848
0.2583	-1.588	-0.829
0.2666	-1.588	-0.810
0.2750	-1.588	-0.791
0.2833	-1.581	-0.772
0.2916	-1.581	-0.756

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0.3000	-1.581	-0.738
0.3083	-1.575	-0.722
0.3166	-1.575	-0.706
0.3250	-1.575	-0.687
0.3333	-1.575	-0.674
0.3500	-1.569	-0.643
0.3666	-1.563	-0.615
0.3833	-1.563	-0.589
0.4000	-1.556	-0.561
0.4166	-1.556	-0.539
0.4333	-1.550	-0.514
0.4500	-1.550	-0.492
0.4666	-1.550	-0.469
0.4833	-1.544	-0.451
0.5000	-1.537	-0.428
0.5166	-1.537	-0.413
0.5333	-1.537	-0.394
0.5500	-1.531	-0.375
0.5666	-1.531	-0.359
0.5833	-1.525	-0.343
0.6000	-1.525	-0.328
0.6166	-1.525	-0.312
0.6333	-1.518	-0.299
0.6500	-1.518	-0.283
0.6666	-1.512	-0.274
0.6833	-1.512	-0.261
0.7000	-1.512	-0.249
0.7166	-1.506	-0.239
0.7333	-1.506	-0.230
0.7500	-1.506	-0.220
0.7666	-1.506	-0.211
0.7833	-1.499	-0.205
0.8000	-1.493	-0.195
0.8166	-1.499	-0.189
0.8333	-1.493	-0.179
0.8500	-1.493	-0.170
0.8666	-1.487	-0.164
0.8833	-1.487	-0.157
0.9000	-1.487	-0.151
0.9166	-1.487	-0.145
0.9333	-1.480	-0.138
0.9500	-1.480	-0.135
0.9666	-1.480	-0.129
0.9833	-1.474	-0.123
1.0000	-1.474	-0.119
1.2000	-1.449	-0.069
1.4000	-1.430	-0.037
1.6000	-1.411	-0.022
1.8000	-1.392	-0.012
2.0000	-1.379	-0.006
2.2000	-1.360	-0.003
2.4000	-1.347	0.000
2.6000	-1.335	0.003
2.8000	-1.316	0.006
3.0000	-1.303	0.006
3.2000	-1.290	0.006
3.4000	-1.278	0.009
3.6000	-1.265	0.012
3.8000	-1.259	0.018
4.0000	-1.246	0.018

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4.2000	-1.240	0.015
4.4000	-1.227	0.015
4.6000	-1.221	0.015
4.8000	-1.208	0.018
5.0000	-1.196	0.018
5.2000	-1.189	0.018
5.4000	-1.183	0.025
5.6000	-1.170	0.031
5.8000	-1.164	0.025
6.0000	-1.151	0.025
6.2000	-1.145	0.025
6.4000	-1.139	0.028
6.6000	-1.132	0.028
6.8000	-1.126	0.022
7.0000	-1.120	0.018
7.2000	-1.113	0.018
7.4000	-1.107	0.022
7.6000	-1.101	0.022
7.8000	-1.094	0.018
8.0000	-1.088	0.022
8.2000	-1.075	0.025
8.4000	-1.075	0.028
8.6000	-1.069	0.031
8.8000	-1.063	0.028
9.0000	-1.056	0.028
9.2000	-1.050	0.031
9.4000	-1.044	0.031
9.6000	-1.044	0.031
9.8000	-1.037	0.031
10.0000	-1.031	0.028
12.0000	-0.987	0.022
14.0000	-0.949	0.028
16.0000	-0.923	0.028
18.0000	-0.898	0.028
20.0000	-0.879	0.025
22.0000	-0.854	0.025
24.0000	-0.848	0.034
26.0000	-0.835	0.031
28.0000	-0.829	0.031
30.0000	-0.816	0.037
32.0000	-0.803	0.028
34.0000	-0.797	0.028
36.0000	-0.797	0.034
38.0000	-0.791	0.037
40.0000	-0.778	0.028

001160.0172

SE2000
Environmental Logger
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Unit# 404 Test 18

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-012
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 0 05/26 10:18:10

Elapsed Time	INPUT 1
0.0000	0.009
0.0083	0.094
0.0166	3.241
0.0250	2.125
0.0333	2.071
0.0416	2.219
0.0500	2.024
0.0583	1.421
0.0666	1.289
0.0750	1.437
0.0833	1.327
0.0916	1.302
0.1000	1.264
0.1083	1.232
0.1166	1.204
0.1250	1.176
0.1333	1.147
0.1416	1.119
0.1500	1.090
0.1583	1.062
0.1666	1.040
0.1750	1.008
0.1833	0.993
0.1916	0.971
0.2000	0.945
0.2083	0.923
0.2166	0.901
0.2250	0.882
0.2333	0.857
0.2416	0.841
0.2500	0.822
0.2583	0.807
0.2666	0.797
0.2750	0.781
0.2833	0.769
0.2916	0.753

0.3000	0.740
0.3083	0.731
0.3166	0.718
0.3250	0.706
0.3333	0.690
0.3500	0.662
0.3666	0.630
0.3833	0.602
0.4000	0.573
0.4166	0.551
0.4333	0.526
0.4500	0.504
0.4666	0.482
0.4833	0.460
0.5000	0.441
0.5166	0.422
0.5333	0.403
0.5500	0.387
0.5666	0.372
0.5833	0.356
0.6000	0.340
0.6166	0.327
0.6333	0.312
0.6500	0.299
0.6666	0.286
0.6833	0.277
0.7000	0.264
0.7166	0.252
0.7333	0.245
0.7500	0.233
0.7666	0.223
0.7833	0.214
0.8000	0.204
0.8166	0.198
0.8333	0.189
0.8500	0.182
0.8666	0.176
0.8833	0.167
0.9000	0.163
0.9166	0.154
0.9333	0.148
0.9500	0.145
0.9666	0.138
0.9833	0.132
1.0000	0.129
1.2000	0.085
1.4000	0.053
1.6000	0.037
1.8000	0.022
2.0000	0.012
2.2000	0.009
2.4000	0.006
2.6000	0.003
2.8000	0.003
3.0000	0.000
3.2000	0.000
3.4000	-0.022

001160.0174

SE2000
Environmental Logger
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Unit# 404 Test 18

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-012
Reference	0.000
SG	1.000
Linearity	0.006
Scale factor	9.989
Offset	-0.012
Delay mSEC	50.000

Step 1 05/26 10:21:42

Elapsed Time	INPUT 1
0.0000	-0.413
0.0083	-2.093
0.0166	-1.847
0.0250	-0.706
0.0333	-1.491
0.0416	-1.642
0.0500	-1.693
0.0583	-1.598
0.0666	-1.525
0.0750	-1.554
0.0833	-1.453
0.0916	-1.434
0.1000	-1.415
0.1083	-1.368
0.1166	-1.377
0.1250	-1.311
0.1333	-1.276
0.1416	-1.239
0.1500	-1.216
0.1583	-0.898
0.1666	-1.368
0.1750	-1.119
0.1833	-1.100
0.1916	-1.075
0.2000	-1.049
0.2083	-1.027
0.2166	-0.993
0.2250	-0.961
0.2333	-1.037
0.2416	-0.948
0.2500	-0.885
0.2583	-0.863
0.2666	-0.841
0.2750	-0.826
0.2833	-0.803
0.2916	-0.788

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0.3000	-0.769
0.3083	-0.753
0.3166	-0.731
0.3250	-0.718
0.3333	-0.699
0.3500	-0.668
0.3666	-0.640
0.3833	-0.608
0.4000	-0.583
0.4166	-0.558
0.4333	-0.532
0.4500	-0.507
0.4666	-0.485
0.4833	-0.463
0.5000	-0.447
0.5166	-0.425
0.5333	-0.406
0.5500	-0.390
0.5666	-0.375
0.5833	-0.359
0.6000	-0.343
0.6166	-0.327
0.6333	-0.315
0.6500	-0.299
0.6666	-0.290
0.6833	-0.277
0.7000	-0.264
0.7166	-0.252
0.7333	-0.242
0.7500	-0.233
0.7666	-0.223
0.7833	-0.214
0.8000	-0.208
0.8166	-0.198
0.8333	-0.189
0.8500	-0.182
0.8666	-0.176
0.8833	-0.167
0.9000	-0.160
0.9166	-0.154
0.9333	-0.148
0.9500	-0.141
0.9666	-0.135
0.9833	-0.132
1.0000	-0.126
1.2000	-0.075
1.4000	-0.050
1.6000	-0.031
1.8000	-0.022
2.0000	-0.012

001160.0176

SE2000
Environmental Logger
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Unit# 404 Test 6

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-013	MW-014
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 0 05/23 16:14:44

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	0.047
0.0083	0.000	0.041
0.0166	0.006	3.429
0.0250	0.006	1.924
0.0333	1.038	2.205
0.0416	2.494	1.848
0.0500	1.386	1.482
0.0583	2.095	1.608
0.0666	1.398	1.671
0.0750	0.373	1.611
0.0833	1.493	1.649
0.0916	1.031	1.640
0.1000	1.101	1.558
0.1083	1.145	1.574
0.1166	1.069	1.570
0.1250	1.107	1.545
0.1333	1.069	1.548
0.1416	1.063	1.526
0.1500	1.057	1.517
0.1583	1.038	1.514
0.1666	1.025	1.504
0.1750	1.019	1.495
0.1833	1.012	1.485
0.1916	0.987	1.476
0.2000	0.987	1.470
0.2083	0.987	1.460
0.2166	0.981	1.454
0.2250	0.955	1.444
0.2333	0.949	1.435
0.2416	0.949	1.429
0.2500	0.943	1.419
0.2583	0.930	1.413
0.2666	0.911	1.406
0.2750	0.917	1.397
0.2833	0.911	1.387
0.2916	0.911	1.381

0.3000	0.892	1.375
0.3083	0.879	1.365
0.3166	0.873	1.359
0.3250	0.873	1.353
0.3333	0.873	1.346
0.3500	0.848	1.331
0.3666	0.848	1.315
0.3833	0.816	1.302
0.4000	0.810	1.287
0.4166	0.797	1.277
0.4333	0.778	1.261
0.4500	0.765	1.249
0.4666	0.759	1.236
0.4833	0.753	1.220
0.5000	0.740	1.208
0.5166	0.727	1.195
0.5333	0.721	1.182
0.5500	0.708	1.170
0.5666	0.708	1.157
0.5833	0.683	1.145
0.6000	0.670	1.135
0.6166	0.658	1.123
0.6333	0.658	1.110
0.6500	0.645	1.097
0.6666	0.639	1.085
0.6833	0.626	1.075
0.7000	0.613	1.063
0.7166	0.607	1.053
0.7333	0.601	1.040
0.7500	0.588	1.031
0.7666	0.575	1.018
0.7833	0.575	1.009
0.8000	0.550	0.999
0.8166	0.556	0.987
0.8333	0.538	0.977
0.8500	0.538	0.965
0.8666	0.538	0.958
0.8833	0.525	0.949
0.9000	0.512	0.936
0.9166	0.506	0.927
0.9333	0.500	0.917
0.9500	0.493	0.908
0.9666	0.493	0.899
0.9833	0.481	0.889
1.0000	0.474	0.883
1.2000	0.398	0.782
1.4000	0.335	0.693
1.6000	0.284	0.615
1.8000	0.234	0.545
2.0000	0.202	0.485
2.2000	0.170	0.435
2.4000	0.145	0.387
2.6000	0.126	0.350
2.8000	0.107	0.312
3.0000	0.094	0.277
3.2000	0.082	0.246
3.4000	0.069	0.220
3.6000	0.063	0.198
3.8000	0.050	0.179
4.0000	0.044	0.160

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4.2000	0.037	0.148
4.4000	0.037	0.138
4.6000	0.037	0.126
4.8000	0.025	0.110
5.0000	0.025	0.100
5.2000	0.025	0.088
5.4000	0.025	0.085
5.6000	0.025	0.078
5.8000	0.018	0.075
6.0000	0.018	0.066
6.2000	0.018	0.059
6.4000	0.018	0.056
6.6000	0.012	0.050
6.8000	0.012	0.053
7.0000	0.012	0.050
7.2000	0.012	0.047
7.4000	0.012	0.044
7.6000	0.012	0.041
7.8000	0.012	0.034
8.0000	0.006	0.031
8.2000	0.006	0.034
8.4000	0.012	0.037

001160.0179

SE2000
Environmental Logger
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Unit# 404 Test 6

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-013	MW-014
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 1 05/23 16:23:19

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	0.028
0.0083	-0.335	-0.066
0.0166	-0.012	-0.274
0.0250	-0.632	0.075
0.0333	-0.594	0.110
0.0416	-0.873	-0.662
0.0500	-1.278	-0.788
0.0583	-1.417	-1.488
0.0666	-1.461	-1.712
0.0750	-1.411	-1.741
0.0833	-1.354	-1.709
0.0916	-1.335	-1.693
0.1000	-1.322	-1.747
0.1083	-1.303	-1.678
0.1166	-1.284	-1.646
0.1250	-1.265	-1.640
0.1333	-1.252	-1.627
0.1416	-1.240	-1.614
0.1500	-1.221	-1.589
0.1583	-1.208	-1.580
0.1666	-1.196	-1.580
0.1750	-1.183	-1.564
0.1833	-1.170	-1.555
0.1916	-1.158	-1.545
0.2000	-1.145	-1.539
0.2083	-1.132	-1.529
0.2166	-1.120	-1.529
0.2250	-1.107	-1.514
0.2333	-1.094	-1.504
0.2416	-1.082	-1.498
0.2500	-1.069	-1.488
0.2583	-1.063	-1.479
0.2666	-1.050	-1.473
0.2750	-1.037	-1.469
0.2833	-1.031	-1.460
0.2916	-1.018	-1.454

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0.3000	-1.012	-1.444
0.3083	-0.999	-1.435
0.3166	-0.987	-1.425
0.3250	-0.980	-1.419
0.3333	-0.968	-1.413
0.3500	-0.949	-1.400
0.3666	-0.930	-1.391
0.3833	-0.911	-1.378
0.4000	-0.892	-1.362
0.4166	-0.879	-1.346
0.4333	-0.860	-1.334
0.4500	-0.841	-1.318
0.4666	-0.829	-1.305
0.4833	-0.810	-1.293
0.5000	-0.797	-1.280
0.5166	-0.778	-1.264
0.5333	-0.765	-1.252
0.5500	-0.753	-1.239
0.5666	-0.740	-1.227
0.5833	-0.721	-1.214
0.6000	-0.715	-1.201
0.6166	-0.696	-1.192
0.6333	-0.683	-1.176
0.6500	-0.670	-1.167
0.6666	-0.658	-1.154
0.6833	-0.645	-1.145
0.7000	-0.639	-1.132
0.7166	-0.626	-1.126
0.7333	-0.613	-1.113
0.7500	-0.601	-1.100
0.7666	-0.594	-1.091
0.7833	-0.582	-1.081
0.8000	-0.569	-1.069
0.8166	-0.563	-1.056
0.8333	-0.550	-1.047
0.8500	-0.544	-1.034
0.8666	-0.531	-1.025
0.8833	-0.525	-1.015
0.9000	-0.512	-1.006
0.9166	-0.506	-0.993
0.9333	-0.499	-0.984
0.9500	-0.487	-0.974
0.9666	-0.480	-0.965
0.9833	-0.468	-0.962
1.0000	-0.461	-0.946
1.2000	-0.373	-0.832
1.4000	-0.303	-0.741
1.6000	-0.246	-0.656
1.8000	-0.202	-0.577
2.0000	-0.164	-0.514
2.2000	-0.139	-0.460
2.4000	-0.113	-0.406
2.6000	-0.094	-0.359
2.8000	-0.082	-0.318
3.0000	-0.069	-0.277
3.2000	-0.056	-0.246
3.4000	-0.044	-0.211
3.6000	-0.037	-0.182
3.8000	-0.031	-0.160
4.0000	-0.025	-0.141

001160.0181

4.2000	-0.025	-0.123
4.4000	-0.018	-0.107
4.6000	-0.018	-0.097
4.8000	-0.012	-0.078
5.0000	-0.012	-0.066
5.2000	-0.012	-0.050
5.4000	-0.006	-0.037
5.6000	-0.006	-0.034
5.8000	-0.006	-0.031
6.0000	-0.006	-0.022

001160.0182

SE2000
Environmental Logger
05/24 12:39

Unit# 404 Test 7

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~017~~ 015	MW-~~018~~ 016
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 0 05/23 17:19:49

Elapsed Time	INPUT 1	INPUT 2
0.0000	-3.542	0.015
0.0083	-3.511	0.854
0.0166	-3.511	1.233
0.0250	-3.504	3.375
0.0333	-3.498	2.094
0.0416	-3.473	1.655
0.0500	-3.504	2.062
0.0583	-1.392	0.961
0.0666	-2.119	1.476
0.0750	-2.145	1.491
0.0833	-1.271	1.463
0.0916	-3.492	1.476
0.1000	-2.277	1.428
0.1083	-2.878	1.406
0.1166	-2.613	1.390
0.1250	-2.828	1.375
0.1333	-2.733	1.356
0.1416	-2.840	1.337
0.1500	-2.815	1.321
0.1583	-2.866	1.302
0.1666	-2.866	1.290
0.1750	-2.897	1.271
0.1833	-2.916	1.255
0.1916	-2.935	1.239
0.2000	-2.954	1.226
0.2083	-2.961	1.207
0.2166	-2.980	1.192
0.2250	-2.986	1.176
0.2333	-2.998	1.160
0.2416	-3.005	1.144
0.2500	-3.017	1.132
0.2583	-3.024	1.116
0.2666	-3.030	1.103
0.2750	-3.036	1.088
0.2833	-3.043	1.072
0.2916	-3.049	1.059

001160.0183

0.3000	-3.049	1.047
0.3083	-3.055	1.031
0.3166	-3.062	1.018
0.3250	-3.062	1.006
0.3333	-3.068	0.993
0.3500	-3.074	0.968
0.3666	-3.081	0.943
0.3833	-3.087	0.917
0.4000	-3.093	0.892
0.4166	-3.093	0.873
0.4333	-3.100	0.848
0.4500	-3.100	0.826
0.4666	-3.106	0.804
0.4833	-3.106	0.785
0.5000	-3.112	0.763
0.5166	-3.112	0.744
0.5333	-3.119	0.725
0.5500	-3.119	0.706
0.5666	-3.119	0.690
0.5833	-3.119	0.674
0.6000	-3.125	0.656
0.6166	-3.125	0.637
0.6333	-3.125	0.621
0.6500	-3.125	0.605
0.6666	-3.131	0.589
0.6833	-3.131	0.574
0.7000	-3.131	0.558
0.7166	-3.131	0.545
0.7333	-3.131	0.533
0.7500	-3.138	0.517
0.7666	-3.138	0.504
0.7833	-3.138	0.488
0.8000	-3.138	0.479
0.8166	-3.138	0.463
0.8333	-3.144	0.454
0.8500	-3.144	0.441
0.8666	-3.144	0.428
0.8833	-3.144	0.419
0.9000	-3.144	0.406
0.9166	-3.144	0.397
0.9333	-3.144	0.387
0.9500	-3.144	0.378
0.9666	-3.150	0.365
0.9833	-3.150	0.356
1.0000	-3.150	0.346
1.2000	-3.157	0.246
1.4000	-3.163	0.182
1.6000	-3.169	0.135
1.8000	-3.176	0.100
2.0000	-3.176	0.075
2.2000	-3.182	0.050
2.4000	-3.188	0.031
2.6000	-3.195	0.018
2.8000	-3.201	0.006
3.0000	-3.207	0.000
3.2000	-3.214	-0.006
3.4000	-3.214	-0.009
3.6000	-3.214	-0.012
3.8000	-3.220	-0.012
4.0000	-3.226	-0.015

001160.0184

4.2000	-3.233	-0.018
4.4000	-3.233	-0.018
4.6000	-3.239	-0.022
4.8000	-3.239	-0.022
5.0000	-3.245	-0.025
5.2000	-3.245	-0.022
5.4000	-3.251	-0.022
5.6000	-3.245	-0.025
5.8000	-3.258	-0.022
6.0000	-3.258	-0.025
6.2000	-3.264	-0.025
6.4000	-3.264	-0.025
6.6000	-3.264	-0.025
6.8000	-3.270	-0.025
7.0000	-3.270	-0.025
7.2000	-3.277	-0.025
7.4000	-3.277	-0.025
7.6000	-3.277	-0.025
7.8000	-3.283	-0.025
8.0000	-3.283	-0.025
8.2000	-3.289	-0.025
8.4000	-3.289	-0.025
8.6000	-3.289	-0.022
8.8000	-3.289	-0.025
9.0000	-3.289	-0.025
9.2000	-3.296	-0.025
9.4000	-3.296	-0.028
9.6000	-3.296	-0.025
9.8000	-3.302	-0.025
10.0000	-3.302	-0.025
12.0000	-3.327	-0.025
14.0000	-3.340	-0.025
16.0000	-3.359	-0.025
18.0000	-3.372	-0.022
20.0000	-3.378	-0.018
22.0000	-3.391	-0.022
24.0000	-3.403	-0.022
26.0000	-3.403	-0.018
28.0000	-3.416	-0.018
30.0000	-3.429	-0.018
32.0000	-3.435	-0.022
34.0000	-3.435	-0.022
36.0000	-3.441	-0.022
38.0000	-3.448	-0.022

SE2000
Environmental Logger
05/24 12:42

Unit# 404 Test 7

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~017~~ 015	MW-~~018~~ 016
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 1 05/23 17:58:24

Elapsed Time	INPUT 1	INPUT 2
0.0000	-3.441	-0.022
0.0083	-3.441	-0.041
0.0166	-3.441	-0.838
0.0250	-3.441	-1.952
0.0333	-3.947	-1.712
0.0416	-3.644	-1.630
0.0500	-3.675	-1.775
0.0583	-3.757	-1.756
0.0666	-4.453	-1.715
0.0750	-4.750	-1.671
0.0833	-4.769	-1.658
0.0916	-4.769	-1.633
0.1000	-4.775	-1.580
0.1083	-4.750	-1.605
0.1166	-4.718	-1.586
0.1250	-4.700	-1.567
0.1333	-4.700	-1.507
0.1416	-4.662	-1.520
0.1500	-4.643	-1.491
0.1583	-4.617	-1.460
0.1666	-4.605	-1.450
0.1750	-4.586	-1.431
0.1833	-4.567	-1.412
0.1916	-4.548	-1.393
0.2000	-4.535	-1.378
0.2083	-4.516	-1.359
0.2166	-4.504	-1.340
0.2250	-4.485	-1.321
0.2333	-4.472	-1.305
0.2416	-4.453	-1.289
0.2500	-4.440	-1.274
0.2583	-4.428	-1.258
0.2666	-4.409	-1.242
0.2750	-4.396	-1.226
0.2833	-4.383	-1.211
0.2916	-4.371	-1.195

001160.0186

0.3000	-4.358	-1.182
0.3083	-4.345	-1.166
0.3166	-4.326	-1.151
0.3250	-4.320	-1.138
0.3333	-4.308	-1.122
0.3500	-4.282	-1.097
0.3666	-4.257	-1.069
0.3833	-4.238	-1.043
0.4000	-4.219	-1.018
0.4166	-4.200	-0.996
0.4333	-4.181	-0.971
0.4500	-4.162	-0.949
0.4666	-4.149	-0.924
0.4833	-4.130	-0.902
0.5000	-4.118	-0.883
0.5166	-4.099	-0.861
0.5333	-4.086	-0.838
0.5500	-4.074	-0.820
0.5666	-4.061	-0.801
0.5833	-4.055	-0.782
0.6000	-4.042	-0.763
0.6166	-4.029	-0.744
0.6333	-4.023	-0.728
0.6500	-4.017	-0.706
0.6666	-4.004	-0.693
0.6833	-3.998	-0.671
0.7000	-3.991	-0.662
0.7166	-3.985	-0.646
0.7333	-3.979	-0.630
0.7500	-3.972	-0.615
0.7666	-3.966	-0.599
0.7833	-3.960	-0.586
0.8000	-3.953	-0.574
0.8166	-3.947	-0.561
0.8333	-3.941	-0.545
0.8500	-3.941	-0.536
0.8666	-3.934	-0.520
0.8833	-3.928	-0.510
0.9000	-3.928	-0.498
0.9166	-3.922	-0.485
0.9333	-3.922	-0.476
0.9500	-3.915	-0.466
0.9666	-3.909	-0.454
0.9833	-3.909	-0.444
1.0000	-3.903	-0.435
1.2000	-3.871	-0.328
1.4000	-3.852	-0.255
1.6000	-3.833	-0.198
1.8000	-3.821	-0.157
2.0000	-3.814	-0.126
2.2000	-3.802	-0.104
2.4000	-3.795	-0.088
2.6000	-3.789	-0.072
2.8000	-3.783	-0.063
3.0000	-3.776	-0.056
3.2000	-3.770	-0.053
3.4000	-3.770	-0.050
3.6000	-3.764	-0.044
3.8000	-3.764	-0.044
4.0000	-3.757	-0.044

001160.0187

4.2000	-3.757	-0.041
4.4000	-3.751	-0.034
4.6000	-3.751	-0.037
4.8000	-3.745	-0.037
5.0000	-3.745	-0.037
5.2000	-3.745	-0.034
5.4000	-3.738	-0.034
5.6000	-3.738	-0.034
5.8000	-3.738	-0.037
6.0000	-3.732	-0.034
6.2000	-3.732	-0.034
6.4000	-3.732	-0.034
6.6000	-3.726	-0.034
6.8000	-3.726	-0.034
7.0000	-3.726	-0.037
7.2000	-3.719	-0.034
7.4000	-3.719	-0.034
7.6000	-3.719	-0.034
7.8000	-3.719	-0.034
8.0000	-3.719	-0.034
8.2000	-3.713	-0.031
8.4000	-3.713	-0.031
8.6000	-3.713	-0.031
8.8000	-3.713	-0.031
9.0000	-3.707	-0.034
9.2000	-3.707	-0.034
9.4000	-3.707	-0.034
9.6000	-3.707	-0.034
9.8000	-3.700	-0.031
10.0000	-3.707	-0.031
12.0000	-3.694	-0.031
14.0000	-3.688	-0.031
16.0000	-3.682	0.003
18.0000	-3.675	-0.031
20.0000	-3.669	-0.034
22.0000	-3.656	-0.034
24.0000	-3.663	-0.034

001160.0188

SE2000
Environmental Logger
05/24 12:44

Unit# 404 Test 8

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-017	MW-018
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 0 05/24 07:45:52

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	-0.485
0.0083	0.000	-0.119
0.0166	0.354	1.050
0.0250	1.000	2.214
0.0333	0.981	2.214
0.0416	2.076	1.930
0.0500	2.076	2.858
0.0583	1.443	1.148
0.0666	1.323	0.949
0.0750	0.886	0.914
0.0833	0.411	0.880
0.0916	1.354	0.835
0.1000	0.873	0.798
0.1083	0.841	0.747
0.1166	1.050	0.706
0.1250	0.759	0.671
0.1333	0.924	0.630
0.1416	0.797	0.589
0.1500	0.797	0.567
0.1583	0.784	0.536
0.1666	0.740	0.514
0.1750	0.746	0.482
0.1833	0.702	0.460
0.1916	0.689	0.438
0.2000	0.664	0.419
0.2083	0.651	0.394
0.2166	0.632	0.375
0.2250	0.613	0.356
0.2333	0.594	0.337
0.2416	0.575	0.321
0.2500	0.563	0.305
0.2583	0.544	0.293
0.2666	0.525	0.277
0.2750	0.512	0.261
0.2833	0.500	0.252
0.2916	0.481	0.236

001160.0189

0.3000	0.468	0.223
0.3083	0.455	0.214
0.3166	0.443	0.205
0.3250	0.430	0.192
0.3333	0.417	0.182
0.3500	0.398	0.167
0.3666	0.379	0.151
0.3833	0.354	0.135
0.4000	0.335	0.123
0.4166	0.316	0.113
0.4333	0.297	0.100
0.4500	0.284	0.091
0.4666	0.265	0.085
0.4833	0.253	0.075
0.5000	0.234	0.066
0.5166	0.227	0.063
0.5333	0.215	0.056
0.5500	0.202	0.050
0.5666	0.196	0.047
0.5833	0.183	0.041
0.6000	0.177	0.037
0.6166	0.164	0.034
0.6333	0.158	0.034
0.6500	0.151	0.028
0.6666	0.145	0.028
0.6833	0.132	0.025
0.7000	0.132	0.022
0.7166	0.113	0.022
0.7333	0.120	0.018
0.7500	0.107	0.018
0.7666	0.101	0.018
0.7833	0.094	0.015
0.8000	0.094	0.015
0.8166	0.094	0.015
0.8333	0.082	0.015
0.8500	0.082	0.012
0.8666	0.082	0.012
0.8833	0.075	0.012
0.9000	0.069	0.012
0.9166	0.063	0.012
0.9333	0.063	0.012
0.9500	0.063	0.009
0.9666	0.063	0.009
0.9833	0.056	0.009
1.0000	0.050	0.009
1.2000	0.031	0.012
1.4000	0.018	0.012
1.6000	0.012	0.012
1.8000	0.012	0.015
2.0000	0.006	0.015
2.2000	0.018	0.015
2.4000	0.012	0.018
2.6000	0.006	0.022
2.8000	0.012	0.022
3.0000	0.006	0.022
3.2000	0.000	0.022
3.4000	0.006	0.025
3.6000	0.006	0.025
3.8000	0.006	0.028
4.0000	0.006	0.028

001160.0190

4.2000	0.006	0.031
4.4000	0.006	0.031
4.6000	0.006	0.031
4.8000	0.000	0.031

SE2000
Environmental Logger
05/24 12:47

Unit# 404 Test 8

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-017	MW-018
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 1 05/24 07:50:50

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.012	0.028
0.0083	-0.322	0.028
0.0166	-0.310	0.025
0.0250	-0.367	-0.432
0.0333	-0.139	-0.548
0.0416	-0.689	-0.214
0.0500	-0.917	-1.255
0.0583	-1.082	0.123
0.0666	-1.544	-1.492
0.0750	-1.316	-1.476
0.0833	-1.164	-1.337
0.0916	-1.303	-1.245
0.1000	-1.139	-1.160
0.1083	-1.139	-1.110
0.1166	-1.126	-1.037
0.1250	-1.050	-0.981
0.1333	-1.037	-0.927
0.1416	-0.999	-0.876
0.1500	-0.968	-0.823
0.1583	-0.942	-0.741
0.1666	-0.904	-0.731
0.1750	-0.879	-0.678
0.1833	-0.854	-0.646
0.1916	-0.829	-0.611
0.2000	-0.810	-0.580
0.2083	-0.778	-0.542
0.2166	-0.759	-0.514
0.2250	-0.734	-0.485
0.2333	-0.715	-0.492
0.2416	-0.696	-0.435
0.2500	-0.670	-0.451
0.2583	-0.651	-0.394
0.2666	-0.632	-0.365
0.2750	-0.613	-0.350
0.2833	-0.601	-0.318
0.2916	-0.575	-0.296

001160.0192

0.3000	-0.556	-0.280
0.3083	-0.544	-0.261
0.3166	-0.531	-0.242
0.3250	-0.506	-0.223
0.3333	-0.493	-0.208
0.3500	-0.468	-0.179
0.3666	-0.443	-0.151
0.3833	-0.411	-0.123
0.4000	-0.392	-0.104
0.4166	-0.373	-0.088
0.4333	-0.348	-0.085
0.4500	-0.329	-0.072
0.4666	-0.310	-0.050
0.4833	-0.297	-0.047
0.5000	-0.278	-0.034
0.5166	-0.265	-0.028
0.5333	-0.246	-0.018
0.5500	-0.234	-0.012
0.5666	-0.221	-0.006
0.5833	-0.208	0.000
0.6000	-0.196	0.009
0.6166	-0.183	0.012
0.6333	-0.170	0.015
0.6500	-0.164	0.022
0.6666	-0.158	0.025
0.6833	-0.145	0.028
0.7000	-0.139	0.031
0.7166	-0.132	0.034
0.7333	-0.126	0.037
0.7500	-0.113	0.041
0.7666	-0.107	0.041
0.7833	-0.101	0.047
0.8000	-0.101	0.044
0.8166	-0.082	0.047
0.8333	-0.088	0.050
0.8500	-0.088	0.050
0.8666	-0.075	0.056
0.8833	-0.082	0.053
0.9000	-0.069	0.050
0.9166	-0.069	0.063
0.9333	-0.063	0.063
0.9500	-0.063	0.059
0.9666	-0.063	0.003
0.9833	-0.050	0.056
1.0000	-0.056	0.066
1.2000	-0.025	0.072
1.4000	-0.012	0.075
1.6000	-0.012	0.078
1.8000	-0.006	0.078
2.0000	-0.006	0.082
2.2000	0.000	0.082
2.4000	0.000	0.085
2.6000	0.000	0.085
2.8000	0.000	0.085
3.0000	0.000	0.085
3.2000	0.006	0.088

001160.0193

SE2000
Environmental Logger
05/24 12:49

Unit# 404 Test 9

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-019	MW-020
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 0 05/24 09:12:49

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	0.012
0.0083	0.006	3.065
0.0166	0.000	2.850
0.0250	0.025	2.396
0.0333	0.537	2.674
0.0416	0.936	2.494
0.0500	1.366	-1.362
0.0583	2.062	1.696
0.0666	2.151	1.791
0.0750	0.550	1.794
0.0833	0.189	1.788
0.0916	1.360	1.788
0.1000	0.898	1.784
0.1083	0.714	1.784
0.1166	1.100	1.778
0.1250	0.803	1.778
0.1333	0.885	1.769
0.1416	0.930	1.772
0.1500	0.803	1.766
0.1583	0.904	1.762
0.1666	0.828	1.756
0.1750	0.841	1.753
0.1833	0.835	1.753
0.1916	0.803	1.747
0.2000	0.822	1.747
0.2083	0.797	1.740
0.2166	0.790	1.737
0.2250	0.784	1.731
0.2333	0.778	1.728
0.2416	0.771	1.725
0.2500	0.765	1.721
0.2583	0.759	1.718
0.2666	0.752	1.715
0.2750	0.733	1.712
0.2833	0.733	1.709
0.2916	0.727	1.706

001160.0194

0.3000	0.721	1.702
0.3083	0.714	1.696
0.3166	0.708	1.693
0.3250	0.695	1.693
0.3333	0.695	1.687
0.3500	0.683	1.684
0.3666	0.676	1.674
0.3833	0.657	1.668
0.4000	0.651	1.658
0.4166	0.638	1.655
0.4333	0.632	1.649
0.4500	0.620	1.639
0.4666	0.607	1.636
0.4833	0.594	1.630
0.5000	0.588	1.624
0.5166	0.582	1.614
0.5333	0.569	1.608
0.5500	0.563	1.602
0.5666	0.556	1.598
0.5833	0.544	1.589
0.6000	0.544	1.583
0.6166	0.537	1.579
0.6333	0.525	1.573
0.6500	0.518	1.567
0.6666	0.518	1.561
0.6833	0.512	1.554
0.7000	0.506	1.548
0.7166	0.493	1.542
0.7333	0.493	1.535
0.7500	0.487	1.532
0.7666	0.480	1.526
0.7833	0.474	1.516
0.8000	0.468	1.513
0.8166	0.461	1.504
0.8333	0.461	1.501
0.8500	0.449	1.497
0.8666	0.455	1.491
0.8833	0.449	1.485
0.9000	0.442	1.479
0.9166	0.442	1.472
0.9333	0.436	1.469
0.9500	0.436	1.463
0.9666	0.423	1.456
0.9833	0.430	1.450
1.0000	0.423	1.447
1.2000	0.392	1.378
1.4000	0.373	1.321
1.6000	0.354	1.267
1.8000	0.341	1.210
2.0000	0.341	1.160
2.2000	0.328	1.110
2.4000	0.322	1.065
2.6000	0.322	1.024
2.8000	0.316	0.983
3.0000	0.309	0.942
3.2000	0.309	0.908
3.4000	0.303	0.873
3.6000	0.303	0.835
3.8000	0.297	0.807
4.0000	0.291	0.775

001160.0195

4.2000	0.284	0.747
4.4000	0.284	0.722
4.6000	0.284	0.696
4.8000	0.284	0.668
5.0000	0.278	0.649
5.2000	0.278	0.627
5.4000	0.272	0.602
5.6000	0.265	0.586
5.8000	0.265	0.561
6.0000	0.265	0.548
6.2000	0.265	0.529
6.4000	0.259	0.510
6.6000	0.259	0.495
6.8000	0.259	0.479
7.0000	0.253	0.466
7.2000	0.246	0.450
7.4000	0.246	0.438
7.6000	0.240	0.422
7.8000	0.240	0.409
8.0000	0.240	0.397
8.2000	0.234	0.387
8.4000	0.234	0.378
8.6000	0.227	0.365
8.8000	0.227	0.356
9.0000	0.227	0.346
9.2000	0.227	0.340
9.4000	0.221	0.327
9.6000	0.221	0.321
9.8000	0.215	0.312
10.0000	0.215	0.302
12.0000	0.202	0.242
14.0000	0.183	0.198
16.0000	0.177	0.167
18.0000	0.164	0.148
20.0000	0.158	0.135
22.0000	0.151	0.126
24.0000	0.139	0.122
26.0000	0.139	0.116
28.0000	0.132	0.113
30.0000	0.132	0.110

SE2000
Environmental Logger
05/24 12:51

Unit# 404 Test 9

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-019	MW-020
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 1 05/24 09:43:10

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.132	-0.725
0.0083	-0.037	-1.551
0.0166	0.107	-1.892
0.0250	0.404	-1.746
0.0333	-0.499	-1.721
0.0416	-0.398	-1.728
0.0500	-0.297	-1.734
0.0583	-0.455	-1.699
0.0666	-0.335	-1.699
0.0750	-0.847	-1.693
0.0833	-0.721	-1.687
0.0916	-1.050	-1.693
0.1000	-1.138	-1.690
0.1083	-0.986	-1.687
0.1166	-1.056	-1.677
0.1250	-0.993	-1.683
0.1333	-0.986	-1.668
0.1416	-0.980	-1.661
0.1500	-0.942	-1.658
0.1583	-0.948	-1.655
0.1666	-0.923	-1.652
0.1750	-0.910	-1.646
0.1833	-0.898	-1.642
0.1916	-0.879	-1.639
0.2000	-0.866	-1.636
0.2083	-0.853	-1.633
0.2166	-0.847	-1.630
0.2250	-0.834	-1.627
0.2333	-0.822	-1.623
0.2416	-0.809	-1.620
0.2500	-0.803	-1.617
0.2583	-0.790	-1.611
0.2666	-0.778	-1.611
0.2750	-0.771	-1.608
0.2833	-0.759	-1.605
0.2916	-0.752	-1.601

001160.0197

0.3000	-0.740	-1.598
0.3083	-0.733	-1.592
0.3166	-0.727	-1.592
0.3250	-0.714	-1.589
0.3333	-0.708	-1.586
0.3500	-0.689	-1.579
0.3666	-0.670	-1.573
0.3833	-0.657	-1.567
0.4000	-0.645	-1.560
0.4166	-0.626	-1.554
0.4333	-0.613	-1.545
0.4500	-0.600	-1.541
0.4666	-0.588	-1.535
0.4833	-0.575	-1.529
0.5000	-0.562	-1.523
0.5166	-0.556	-1.516
0.5333	-0.544	-1.510
0.5500	-0.531	-1.507
0.5666	-0.518	-1.501
0.5833	-0.506	-1.494
0.6000	-0.499	-1.488
0.6166	-0.487	-1.482
0.6333	-0.474	-1.478
0.6500	-0.468	-1.472
0.6666	-0.461	-1.466
0.6833	-0.449	-1.460
0.7000	-0.442	-1.456
0.7166	-0.436	-1.453
0.7333	-0.430	-1.444
0.7500	-0.417	-1.437
0.7666	-0.417	-1.434
0.7833	-0.411	-1.428
0.8000	-0.404	-1.425
0.8166	-0.392	-1.419
0.8333	-0.385	-1.412
0.8500	-0.379	-1.409
0.8666	-0.379	-1.403
0.8833	-0.366	-1.396
0.9000	-0.366	-1.393
0.9166	-0.360	-1.384
0.9333	-0.354	-1.381
0.9500	-0.354	-1.374
0.9666	-0.341	-1.371
0.9833	-0.341	-1.365
1.0000	-0.335	-1.359
1.2000	-0.290	-1.299
1.4000	-0.259	-1.242
1.6000	-0.234	-1.185
1.8000	-0.221	-1.138
2.0000	-0.208	-1.091
2.2000	-0.196	-1.043
2.4000	-0.189	-0.999
2.6000	-0.177	-0.958
2.8000	-0.170	-0.914
3.0000	-0.164	-0.876
3.2000	-0.158	-0.838
3.4000	-0.151	-0.804
3.6000	-0.151	-0.766
3.8000	-0.145	-0.734
4.0000	-0.139	-0.700

001160.0198

4.2000	-0.132	-0.671
4.4000	-0.132	-0.643
4.6000	-0.132	-0.614
4.8000	-0.126	-0.586
5.0000	-0.120	-0.561
5.2000	-0.120	-0.536
5.4000	-0.113	-0.507
5.6000	-0.113	-0.485
5.8000	-0.107	-0.466
6.0000	-0.113	-0.444
6.2000	-0.107	-0.422
6.4000	-0.101	-0.403
6.6000	-0.101	-0.384
6.8000	-0.101	-0.365
7.0000	-0.101	-0.346
7.2000	-0.094	-0.327
7.4000	-0.094	-0.312
7.6000	-0.094	-0.299
7.8000	-0.088	-0.280
8.0000	-0.088	-0.268
8.2000	-0.088	-0.252
8.4000	-0.082	-0.239
8.6000	-0.082	-0.223
8.8000	-0.082	-0.214
9.0000	-0.075	-0.201
9.2000	-0.075	-0.189
9.4000	-0.075	-0.176
9.6000	-0.075	-0.163
9.8000	-0.069	-0.154
10.0000	-0.069	-0.141
12.0000	-0.063	-0.063
14.0000	-0.050	-0.009
16.0000	-0.044	0.025
18.0000	-0.037	0.050
20.0000	-0.025	0.066
22.0000	-0.018	0.075
24.0000	-0.012	0.078
26.0000	-0.006	0.081

001160.0199

SE2000
Environmental Logger
05/24 12:54

Unit# 404 Test 10

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-021	MW-022
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 0 05/24 10:33:20

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	0.268
0.0083	0.000	-2.235
0.0166	0.000	1.734
0.0250	0.000	0.346
0.0333	0.000	1.488
0.0416	0.000	1.592
0.0500	-0.006	1.378
0.0583	0.000	1.463
0.0666	1.030	1.428
0.0750	1.555	1.255
0.0833	0.973	1.302
0.0916	1.106	1.460
0.1000	-0.537	1.192
0.1083	0.284	1.479
0.1166	-0.012	1.107
0.1250	0.145	1.248
0.1333	0.063	1.157
0.1416	0.120	1.053
0.1500	0.101	0.958
0.1583	0.120	1.043
0.1666	0.120	0.980
0.1750	0.120	0.965
0.1833	0.120	0.977
0.1916	0.126	0.930
0.2000	0.120	0.927
0.2083	0.126	0.782
0.2166	0.120	0.886
0.2250	0.126	0.861
0.2333	0.126	0.848
0.2416	0.126	0.820
0.2500	0.126	0.791
0.2583	0.126	0.813
0.2666	0.126	0.662
0.2750	0.126	0.870
0.2833	0.120	0.924
0.2916	0.126	0.905

001160.0200

0.3000	0.126	0.861
0.3083	0.120	0.845
0.3166	0.120	0.826
0.3250	0.120	0.807
0.3333	0.126	0.788
0.3500	0.126	0.750
0.3666	0.120	0.715
0.3833	0.120	0.684
0.4000	0.120	0.652
0.4166	0.120	0.624
0.4333	0.120	0.596
0.4500	0.120	0.570
0.4666	0.120	0.542
0.4833	0.120	0.520
0.5000	0.120	0.498
0.5166	0.120	0.476
0.5333	0.120	0.454
0.5500	0.120	0.435
0.5666	0.120	0.416
0.5833	0.120	0.400
0.6000	0.120	0.381
0.6166	0.120	0.365
0.6333	0.120	0.350
0.6500	0.120	0.337
0.6666	0.120	0.321
0.6833	0.120	0.309
0.7000	0.120	0.296
0.7166	0.120	0.283
0.7333	0.120	0.271
0.7500	0.113	0.258
0.7666	0.120	0.249
0.7833	0.113	0.239
0.8000	0.120	0.230
0.8166	0.120	0.220
0.8333	0.120	0.211
0.8500	0.120	0.205
0.8666	0.113	0.192
0.8833	0.120	0.189
0.9000	0.113	0.179
0.9166	0.120	0.173
0.9333	0.113	0.164
0.9500	0.120	0.157
0.9666	0.113	0.151
0.9833	0.113	0.148
1.0000	0.113	0.141
1.2000	0.113	0.088
1.4000	0.113	0.059
1.6000	0.113	0.041
1.8000	0.107	0.031
2.0000	0.107	0.022
2.2000	0.107	0.015
2.4000	0.107	0.012
2.6000	0.107	0.012
2.8000	0.107	0.009
3.0000	0.107	0.006
3.2000	0.101	0.006
3.4000	0.101	0.003
3.6000	0.101	0.006
3.8000	0.101	0.006
4.0000	0.101	0.003

4.2000	0.094	0.003
4.4000	0.094	0.003
4.6000	0.094	0.003
4.8000	0.094	0.003
5.0000	0.088	0.006
5.2000	0.088	0.006
5.4000	0.088	0.003
5.6000	0.088	0.003
5.8000	0.088	0.003
6.0000	0.088	0.003
6.2000	0.088	0.003
6.4000	0.088	0.003
6.6000	0.082	0.000
6.8000	0.088	0.000
7.0000	0.082	0.000
7.2000	0.082	0.003
7.4000	0.082	0.003
7.6000	0.082	0.000
7.8000	0.082	0.000
8.0000	0.082	0.000
8.2000	0.082	0.000
8.4000	0.082	0.000
8.6000	0.082	0.000
8.8000	0.082	0.003
9.0000	0.075	0.000
9.2000	0.075	0.003
9.4000	0.082	0.003
9.6000	0.075	0.003
9.8000	0.075	0.000
10.0000	0.082	0.006
12.0000	0.075	0.003
14.0000	0.075	-0.003
16.0000	0.075	0.000

SE2000
Environmental Logger
05/24 12:01

Unit# 404 Test 10

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-021	MW-022
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.010
Delay mSEC	50.000	50.000

Step 1 05/24 10:50:37

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.088	-0.094
0.0083	-0.044	-1.166
0.0166	-0.499	-1.299
0.0250	-0.493	-1.217
0.0333	-0.442	-1.182
0.0416	-0.461	-1.170
0.0500	-0.771	-1.151
0.0583	-1.074	-1.132
0.0666	-0.746	-1.113
0.0750	-0.619	-1.097
0.0833	-0.562	-1.081
0.0916	-0.461	-1.065
0.1000	-0.379	-1.047
0.1083	-0.322	-1.031
0.1166	-0.259	-1.018
0.1250	-0.214	-1.002
0.1333	-0.170	-0.987
0.1416	-0.139	-0.974
0.1500	-0.113	-0.958
0.1583	-0.094	-0.946
0.1666	-0.082	-0.936
0.1750	-0.069	-0.920
0.1833	-0.063	-0.908
0.1916	-0.063	-0.895
0.2000	-0.063	-0.883
0.2083	-0.063	-0.870
0.2166	-0.063	-0.860
0.2250	-0.056	-0.838
0.2333	-0.063	-0.835
0.2416	-0.063	-0.823
0.2500	-0.063	-0.807
0.2583	-0.056	-0.801
0.2666	-0.056	-0.791
0.2750	-0.056	-0.775
0.2833	-0.056	-0.769
0.2916	-0.063	-0.753

001160.0203

0.3000	-0.056	-0.747
0.3083	-0.056	-0.731
0.3166	-0.056	-0.728
0.3250	-0.063	-0.715
0.3333	-0.056	-0.703
0.3500	-0.056	-0.687
0.3666	-0.056	-0.668
0.3833	-0.056	-0.652
0.4000	-0.056	-0.633
0.4166	-0.056	-0.614
0.4333	-0.056	-0.599
0.4500	-0.056	-0.583
0.4666	-0.056	-0.570
0.4833	-0.056	-0.555
0.5000	-0.056	-0.542
0.5166	-0.056	-0.526
0.5333	-0.056	-0.510
0.5500	-0.056	-0.498
0.5666	-0.056	-0.485
0.5833	-0.056	-0.473
0.6000	-0.056	-0.460
0.6166	-0.056	-0.447
0.6333	-0.056	-0.435
0.6500	-0.056	-0.425
0.6666	-0.056	-0.416
0.6833	-0.056	-0.409
0.7000	-0.056	-0.394
0.7166	-0.056	-0.384
0.7333	-0.056	-0.375
0.7500	-0.056	-0.365
0.7666	-0.056	-0.356
0.7833	-0.056	-0.350
0.8000	-0.056	-0.337
0.8166	-0.056	-0.331
0.8333	-0.056	-0.321
0.8500	-0.050	-0.315
0.8666	-0.056	-0.305
0.8833	-0.056	-0.296
0.9000	-0.056	-0.293
0.9166	-0.056	-0.283
0.9333	-0.056	-0.271
0.9500	-0.044	-0.261
0.9666	-0.050	-0.261
0.9833	-0.056	-0.258
1.0000	-0.056	-0.245
1.2000	-0.050	-0.182
1.4000	-0.050	-0.138
1.6000	-0.050	-0.107
1.8000	-0.050	-0.082
2.0000	-0.050	-0.066
2.2000	-0.044	-0.056
2.4000	-0.050	-0.047
2.6000	-0.044	-0.041
2.8000	-0.044	-0.037
3.0000	-0.044	-0.031
3.2000	-0.044	-0.028
3.4000	-0.044	-0.025
3.6000	-0.044	-0.022
3.8000	-0.044	-0.022
4.0000	-0.044	-0.022

001160.0204

4.2000	-0.044	-0.018
4.4000	-0.044	-0.018
4.6000	-0.044	-0.018
4.8000	-0.037	-0.022
5.0000	-0.037	-0.018
5.2000	-0.037	-0.018
5.4000	-0.037	-0.018
5.6000	-0.037	-0.018
5.8000	-0.037	-0.015
6.0000	-0.044	-0.015
6.2000	-0.044	-0.018
6.4000	-0.037	-0.015
6.6000	-0.044	-0.012
6.8000	-0.044	-0.018
7.0000	-0.037	-0.015
7.2000	-0.037	-0.015
7.4000	-0.037	-0.012
7.6000	-0.037	-0.012
7.8000	-0.037	-0.012
8.0000	-0.037	-0.012
8.2000	-0.037	-0.012
8.4000	-0.037	-0.012
8.6000	-0.037	-0.009
8.8000	-0.037	-0.009
9.0000	-0.037	-0.009
9.2000	-0.037	-0.009
9.4000	-0.037	-0.012
9.6000	-0.037	-0.012
9.8000	-0.037	-0.009
10.0000	-0.037	-0.012
12.0000	-0.037	-0.012
14.0000	-0.031	-0.012
16.0000	-0.025	-0.012

001160.0205

SE2000
Environmental Logger
05/25 18:44

Unit# 404 Test 1

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~003~~ DP 023	MW-~~004~~ DP 024
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 0 05/24 13:26:49

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	-0.010
0.0083	0.000	-0.095
0.0166	0.006	3.311
0.0250	0.000	3.654
0.0333	0.012	3.406
0.0416	0.297	1.226
0.0500	0.436	2.458
0.0583	0.468	2.241
0.0666	1.151	2.170
0.0750	1.353	2.119
0.0833	1.581	2.069
0.0916	1.246	2.023
0.1000	0.417	1.978
0.1083	0.708	1.928
0.1166	0.778	1.882
0.1250	1.138	1.837
0.1333	0.986	1.796
0.1416	1.005	1.751
0.1500	0.986	1.711
0.1583	0.961	1.675
0.1666	0.955	1.635
0.1750	0.936	1.594
0.1833	0.929	1.554
0.1916	0.910	1.514
0.2000	0.904	1.488
0.2083	0.891	1.448
0.2166	0.879	1.403
0.2250	0.860	1.382
0.2333	0.853	1.352
0.2416	0.847	1.322
0.2500	0.834	1.292
0.2583	0.822	1.261
0.2666	0.815	1.236
0.2750	0.803	1.201
0.2833	0.790	1.176
0.2916	0.784	1.145

001160.0206

0.3000	0.771	1.125
0.3083	0.765	1.095
0.3166	0.752	1.064
0.3250	0.752	1.049
0.3333	0.740	1.019
0.3500	0.721	0.969
0.3666	0.708	0.923
0.3833	0.689	0.883
0.4000	0.676	0.842
0.4166	0.664	0.802
0.4333	0.651	0.772
0.4500	0.632	0.736
0.4666	0.626	0.701
0.4833	0.613	0.676
0.5000	0.600	0.641
0.5166	0.588	0.610
0.5333	0.581	0.585
0.5500	0.575	0.565
0.5666	0.562	0.535
0.5833	0.550	0.509
0.6000	0.543	0.484
0.6166	0.531	0.464
0.6333	0.525	0.454
0.6500	0.512	0.418
0.6666	0.506	0.398
0.6833	0.499	0.393
0.7000	0.493	0.378
0.7166	0.487	0.358
0.7333	0.480	0.328
0.7500	0.468	0.317
0.7666	0.461	0.307
0.7833	0.455	0.287
0.8000	0.442	0.277
0.8166	0.442	0.262
0.8333	0.430	0.252
0.8500	0.423	0.242
0.8666	0.417	0.227
0.8833	0.411	0.217
0.9000	0.404	0.206
0.9166	0.404	0.196
0.9333	0.398	0.191
0.9500	0.392	0.181
0.9666	0.379	0.166
0.9833	0.379	0.161
1.0000	0.366	0.151
1.2000	0.309	0.090
1.4000	0.271	0.055
1.6000	0.234	0.030
1.8000	0.202	0.005
2.0000	0.177	0.000
2.2000	0.145	-0.010
2.4000	0.126	-0.020
2.6000	0.113	-0.010
2.8000	0.101	-0.015
3.0000	0.088	-0.015
3.2000	0.075	-0.015
3.4000	0.063	-0.020
3.6000	0.063	-0.015
3.8000	0.056	-0.015
4.0000	0.050	-0.015

001160.0207

4.2000	0.044	-0.020
4.4000	0.037	-0.025
4.6000	0.037	-0.020
4.8000	0.025	-0.025
5.0000	0.025	-0.025
5.2000	0.025	-0.030
5.4000	0.018	0.005
5.6000	0.018	-0.040
5.8000	0.012	-0.040
6.0000	0.012	-0.030
6.2000	0.012	-0.030
6.4000	0.012	-0.030
6.6000	0.012	-0.025
6.8000	0.006	-0.030
7.0000	0.012	-0.015
7.2000	0.012	-0.015
7.4000	0.012	-0.010
7.6000	0.006	-0.015
7.8000	0.006	-0.020
8.0000	0.012	-0.015
8.2000	0.006	-0.035
8.4000	0.006	-0.015
8.6000	0.006	-0.020
8.8000	0.000	-0.025
9.0000	0.000	-0.020
9.2000	0.006	-0.020

001160.0208

SE2000
Environmental Logger
05/25 18:46

Unit# 404 Test 1

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~003~~ 023	MW-~~004~~ 024
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 1 05/24 13:36:12

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.524	-0.020
0.0083	-0.278	-3.936
0.0166	-0.423	-3.240
0.0250	-0.758	-2.664
0.0333	-0.847	-2.569
0.0416	-1.163	-2.513
0.0500	-1.536	-2.447
0.0583	-1.422	-2.382
0.0666	-1.340	-2.362
0.0750	-1.302	-2.306
0.0833	-1.283	-2.180
0.0916	-1.264	-2.185
0.1000	-1.252	-2.104
0.1083	-1.239	-2.034
0.1166	-1.226	-1.938
0.1250	-1.214	-1.953
0.1333	-1.201	-1.912
0.1416	-1.188	-1.842
0.1500	-1.182	-1.786
0.1583	-1.169	-1.766
0.1666	-1.163	-1.711
0.1750	-1.144	-1.675
0.1833	-1.138	-1.630
0.1916	-1.132	-1.600
0.2000	-1.119	-1.564
0.2083	-1.106	-1.529
0.2166	-1.100	-1.473
0.2250	-1.087	-1.453
0.2333	-1.081	-1.418
0.2416	-1.075	-1.372
0.2500	-1.062	-1.337
0.2583	-1.056	-1.312
0.2666	-1.043	-1.282
0.2750	-1.037	-1.246
0.2833	-1.030	-1.206
0.2916	-1.018	-1.160

001160.0209

0.3000	-1.011	-1.256
0.3083	-1.011	-1.196
0.3166	-0.999	-1.120
0.3250	-0.986	-1.090
0.3333	-0.980	-1.110
0.3500	-0.967	-1.019
0.3666	-0.948	-0.964
0.3833	-0.935	-0.918
0.4000	-0.923	-0.873
0.4166	-0.904	-0.827
0.4333	-0.891	-0.797
0.4500	-0.879	-0.762
0.4666	-0.866	-0.716
0.4833	-0.853	-0.691
0.5000	-0.841	-0.656
0.5166	-0.828	-0.625
0.5333	-0.815	-0.595
0.5500	-0.803	-0.580
0.5666	-0.790	-0.555
0.5833	-0.784	-0.540
0.6000	-0.771	-0.519
0.6166	-0.758	-0.504
0.6333	-0.746	-0.479
0.6500	-0.733	-0.464
0.6666	-0.727	-0.439
0.6833	-0.720	-0.429
0.7000	-0.708	-0.403
0.7166	-0.702	-0.408
0.7333	-0.689	-0.363
0.7500	-0.676	-0.378
0.7666	-0.670	-0.348
0.7833	-0.657	-0.323
0.8000	-0.651	-0.312
0.8166	-0.645	-0.297
0.8333	-0.632	-0.287
0.8500	-0.626	-0.282
0.8666	-0.619	-0.272
0.8833	-0.607	-0.257
0.9000	-0.600	-0.252
0.9166	-0.594	-0.242
0.9333	-0.581	-0.232
0.9500	-0.575	-0.227
0.9666	-0.569	-0.217
0.9833	-0.562	-0.217
1.0000	-0.556	-0.237
1.2000	-0.474	-0.126
1.4000	-0.404	-0.080
1.6000	-0.354	-0.065
1.8000	-0.303	-0.055
2.0000	-0.265	-0.045
2.2000	-0.234	-0.050
2.4000	-0.215	0.025
2.6000	-0.183	-0.030
2.8000	-0.158	-0.035
3.0000	-0.139	-0.035
3.2000	-0.126	-0.035
3.4000	-0.113	-0.035
3.6000	-0.101	-0.035
3.8000	-0.094	-0.030
4.0000	-0.082	-0.035

001160.0210

4.2000	-0.075	-0.025
4.4000	-0.069	-0.030
4.6000	-0.063	-0.030
4.8000	-0.056	-0.030
5.0000	-0.056	-0.030
5.2000	-0.050	-0.030
5.4000	-0.050	-0.025
5.6000	-0.044	-0.025
5.8000	-0.044	-0.025
6.0000	-0.037	-0.020
6.2000	-0.037	-0.040
6.4000	-0.037	-0.020
6.6000	-0.031	-0.040
6.8000	-0.031	-0.035
7.0000	-0.031	-0.035
7.2000	-0.031	-0.035
7.4000	-0.031	-0.020
7.6000	-0.025	-0.020
7.8000	-0.031	-0.025
8.0000	-0.025	-0.030
8.2000	-0.031	-0.035
8.4000	-0.025	-0.030
8.6000	-0.025	-0.020
8.8000	-0.018	-0.025
9.0000	-0.018	-0.020
9.2000	-0.018	-0.025
9.4000	-0.018	-0.030
9.6000	-0.018	-0.035
9.8000	-0.012	-0.030

001160.0211

SE2000
Environmental Logger
05/25 18:48

Unit# 404 Test 2

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-025	MW-026
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 0 05/24 14:01:20

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	0.807
0.0083	0.006	4.532
0.0166	0.006	1.832
0.0250	0.000	2.917
0.0333	0.000	3.033
0.0416	0.006	0.847
0.0500	0.189	1.620
0.0583	1.474	1.771
0.0666	2.119	1.711
0.0750	1.860	1.685
0.0833	0.727	1.665
0.0916	0.196	1.640
0.1000	1.164	1.620
0.1083	0.885	1.600
0.1166	0.651	1.579
0.1250	0.948	1.559
0.1333	0.790	1.539
0.1416	0.797	1.514
0.1500	0.841	1.494
0.1583	0.771	1.473
0.1666	0.809	1.453
0.1750	0.778	1.433
0.1833	0.790	1.413
0.1916	0.771	1.393
0.2000	0.771	1.372
0.2083	0.765	1.352
0.2166	0.759	1.337
0.2250	0.759	1.317
0.2333	0.752	1.302
0.2416	0.746	1.287
0.2500	0.740	1.261
0.2583	0.733	1.251
0.2666	0.733	1.236
0.2750	0.727	1.211
0.2833	0.727	1.211
0.2916	0.721	1.191

001160.0212

0.3000	0.721	1.176
0.3083	0.714	1.145
0.3166	0.708	1.140
0.3250	0.708	1.120
0.3333	0.702	1.105
0.3500	0.695	1.070
0.3666	0.683	1.054
0.3833	0.676	1.019
0.4000	0.670	0.969
0.4166	0.664	0.948
0.4333	0.657	0.933
0.4500	0.651	0.903
0.4666	0.645	0.878
0.4833	0.638	0.858
0.5000	0.632	0.837
0.5166	0.626	0.812
0.5333	0.619	0.792
0.5500	0.613	0.762
0.5666	0.613	0.747
0.5833	0.607	0.721
0.6000	0.600	0.701
0.6166	0.594	0.686
0.6333	0.588	0.666
0.6500	0.588	0.651
0.6666	0.581	0.630
0.6833	0.575	0.605
0.7000	0.569	0.595
0.7166	0.569	0.580
0.7333	0.562	0.560
0.7500	0.556	0.545
0.7666	0.556	0.529
0.7833	0.550	0.514
0.8000	0.544	0.499
0.8166	0.544	0.484
0.8333	0.537	0.469
0.8500	0.531	0.459
0.8666	0.531	0.444
0.8833	0.525	0.429
0.9000	0.525	0.418
0.9166	0.518	0.403
0.9333	0.512	0.393
0.9500	0.512	0.383
0.9666	0.512	0.373
0.9833	0.506	0.363
1.0000	0.506	0.353
1.2000	0.468	0.242
1.4000	0.442	0.161
1.6000	0.423	0.100
1.8000	0.404	0.055
2.0000	0.398	0.025
2.2000	0.379	0.005
2.4000	0.373	-0.010
2.6000	0.366	-0.020
2.8000	0.366	-0.025
3.0000	0.360	-0.030
3.2000	0.354	-0.040
3.4000	0.347	-0.045
3.6000	0.347	-0.055
3.8000	0.335	-0.055
4.0000	0.341	-0.065

001160.0213

4.2000	0.335	-0.060
4.4000	0.335	-0.060
4.6000	0.328	-0.060
4.8000	0.328	-0.050
5.0000	0.328	-0.050
5.2000	0.328	-0.060
5.4000	0.322	-0.060
5.6000	0.322	-0.060
5.8000	0.322	-0.055
6.0000	0.322	-0.050
6.2000	0.316	-0.060
6.4000	0.316	-0.060
6.6000	0.316	-0.060
6.8000	0.316	-0.060
7.0000	0.316	-0.055
7.2000	0.309	-0.055
7.4000	0.316	-0.060
7.6000	0.316	-0.055
7.8000	0.309	-0.055
8.0000	0.309	-0.055
8.2000	0.309	-0.050
8.4000	0.309	-0.045
8.6000	0.309	-0.055
8.8000	0.303	-0.065
9.0000	0.303	-0.040
9.2000	0.303	-0.035
9.4000	0.303	-0.060
9.6000	0.303	-0.050
9.8000	0.303	-0.045
10.0000	0.297	-0.055
12.0000	0.290	-0.055
14.0000	0.290	-0.050
16.0000	0.284	-0.045
18.0000	0.278	-0.045
20.0000	0.271	-0.045
22.0000	0.271	-0.050
24.0000	0.271	-0.040
26.0000	0.265	-0.045
28.0000	0.265	-0.045
30.0000	0.259	-0.045
32.0000	0.259	-0.045
34.0000	0.265	-0.040
36.0000	0.253	-0.035

001160.0214

SE2000
Environmental Logger
05/25 18:51

Unit# 404 Test 2

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-025	MW-026
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 1 05/24 14:37:58

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.044	-1.993
0.0083	0.550	-2.690
0.0166	-0.499	-3.926
0.0250	-0.398	-2.695
0.0333	-0.967	-2.866
0.0416	-0.689	-2.836
0.0500	-1.207	-2.765
0.0583	-0.955	-2.705
0.0666	-0.910	-2.675
0.0750	-0.929	-2.644
0.0833	-0.910	-2.584
0.0916	-0.898	-2.523
0.1000	-0.872	-2.523
0.1083	-0.860	-2.493
0.1166	-0.847	-2.427
0.1250	-0.834	-2.427
0.1333	-0.822	-2.372
0.1416	-0.809	-2.347
0.1500	-0.796	-2.311
0.1583	-0.790	-2.281
0.1666	-0.784	-2.256
0.1750	-0.771	-2.215
0.1833	-0.758	-2.190
0.1916	-0.752	-2.165
0.2000	-0.740	-2.135
0.2083	-0.733	-2.104
0.2166	-0.727	-2.079
0.2250	-0.721	-2.054
0.2333	-0.708	-2.029
0.2416	-0.702	-1.998
0.2500	-0.695	-1.973
0.2583	-0.689	-1.948
0.2666	-0.683	-1.923
0.2750	-0.683	-1.897
0.2833	-0.670	-1.872
0.2916	-0.664	-1.847

001160.0215

0.3000	-0.657	-1.822
0.3083	-0.651	-1.801
0.3166	-0.645	-1.776
0.3250	-0.638	-1.756
0.3333	-0.632	-1.731
0.3500	-0.626	-1.685
0.3666	-0.613	-1.645
0.3833	-0.600	-1.605
0.4000	-0.594	-1.559
0.4166	-0.588	-1.524
0.4333	-0.575	-1.483
0.4500	-0.569	-1.448
0.4666	-0.556	-1.413
0.4833	-0.550	-1.377
0.5000	-0.543	-1.342
0.5166	-0.531	-1.307
0.5333	-0.524	-1.276
0.5500	-0.518	-1.246
0.5666	-0.505	-1.216
0.5833	-0.499	-1.186
0.6000	-0.493	-1.155
0.6166	-0.487	-1.120
0.6333	-0.480	-1.100
0.6500	-0.474	-1.070
0.6666	-0.468	-1.044
0.6833	-0.461	-1.019
0.7000	-0.455	-0.994
0.7166	-0.449	-0.974
0.7333	-0.442	-0.948
0.7500	-0.436	-0.923
0.7666	-0.430	-0.903
0.7833	-0.423	-0.878
0.8000	-0.417	-0.858
0.8166	-0.411	-0.832
0.8333	-0.404	-0.817
0.8500	-0.398	-0.797
0.8666	-0.398	-0.777
0.8833	-0.392	-0.762
0.9000	-0.385	-0.736
0.9166	-0.379	-0.721
0.9333	-0.379	-0.701
0.9500	-0.373	-0.686
0.9666	-0.366	-0.671
0.9833	-0.360	-0.656
1.0000	-0.360	-0.641
1.2000	-0.309	-0.479
1.4000	-0.271	-0.363
1.6000	-0.246	-0.282
1.8000	-0.227	-0.217
2.0000	-0.208	-0.176
2.2000	-0.196	-0.146
2.4000	-0.183	-0.116
2.6000	-0.170	-0.095
2.8000	-0.164	-0.085
3.0000	-0.158	-0.070
3.2000	-0.145	-0.060
3.4000	-0.139	-0.050
3.6000	-0.132	-0.055
3.8000	-0.126	-0.055
4.0000	-0.120	-0.045

001160.0216

4.2000	-0.113	-0.050
4.4000	-0.107	-0.050
4.6000	-0.107	-0.035
4.8000	-0.101	-0.055
5.0000	-0.094	-0.055
5.2000	-0.094	-0.045
5.4000	-0.088	-0.050
5.6000	-0.082	-0.045
5.8000	-0.082	-0.045
6.0000	-0.075	-0.045
6.2000	-0.069	-0.045
6.4000	-0.069	-0.040
6.6000	-0.063	-0.035
6.8000	-0.063	-0.050
7.0000	-0.056	-0.040
7.2000	-0.056	-0.040
7.4000	-0.050	-0.045
7.6000	-0.050	-0.045
7.8000	-0.044	-0.040
8.0000	-0.044	-0.040
8.2000	-0.037	-0.040
8.4000	-0.037	-0.040
8.6000	-0.037	-0.035
8.8000	-0.031	-0.025
9.0000	-0.031	-0.025
9.2000	-0.031	-0.030
9.4000	-0.031	-0.025
9.6000	-0.025	-0.040
9.8000	-0.025	-0.045
10.0000	-0.025	-0.040
12.0000	-0.006	-0.035
14.0000	0.012	-0.050

SE2000
Environmental Logger
05/25 18:54

Unit# 404 Test 3

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~001~~ 027 DP	MW-~~002~~ 028 DP
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 0 05/24 15:23:04

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	0.045
0.0083	0.000	3.558
0.0166	0.000	2.447
0.0250	0.000	4.345
0.0333	0.037	2.018
0.0416	0.714	2.124
0.0500	1.910	2.135
0.0583	1.549	2.074
0.0666	-0.701	2.018
0.0750	0.898	1.958
0.0833	0.113	1.902
0.0916	0.322	1.847
0.1000	0.392	1.796
0.1083	0.183	1.746
0.1166	0.385	1.695
0.1250	0.208	1.650
0.1333	0.335	1.605
0.1416	0.240	1.554
0.1500	0.297	1.514
0.1583	0.259	1.473
0.1666	0.278	1.433
0.1750	0.271	1.393
0.1833	0.265	1.357
0.1916	0.271	1.322
0.2000	0.265	1.297
0.2083	0.271	1.251
0.2166	0.265	1.216
0.2250	0.265	1.186
0.2333	0.265	1.155
0.2416	0.265	1.125
0.2500	0.265	1.095
0.2583	0.265	1.064
0.2666	0.265	1.039
0.2750	0.265	1.014
0.2833	0.265	0.989
0.2916	0.259	0.964

001160.0218

0.3000	0.265	0.938
0.3083	0.265	0.918
0.3166	0.265	0.893
0.3250	0.259	0.873
0.3333	0.265	0.853
0.3500	0.265	0.807
0.3666	0.265	0.772
0.3833	0.259	0.736
0.4000	0.259	0.696
0.4166	0.259	0.666
0.4333	0.259	0.641
0.4500	0.265	0.610
0.4666	0.259	0.585
0.4833	0.259	0.560
0.5000	0.259	0.535
0.5166	0.259	0.514
0.5333	0.259	0.494
0.5500	0.259	0.474
0.5666	0.259	0.454
0.5833	0.259	0.439
0.6000	0.259	0.418
0.6166	0.259	0.403
0.6333	0.259	0.393
0.6500	0.259	0.378
0.6666	0.259	0.363
0.6833	0.259	0.353
0.7000	0.259	0.338
0.7166	0.259	0.333
0.7333	0.259	0.323
0.7500	0.259	0.307
0.7666	0.259	0.302
0.7833	0.259	0.292
0.8000	0.259	0.287
0.8166	0.259	0.277
0.8333	0.259	0.267
0.8500	0.259	0.267
0.8666	0.259	0.257
0.8833	0.259	0.252
0.9000	0.259	0.247
0.9166	0.259	0.242
0.9333	0.259	0.237
0.9500	0.259	0.232
0.9666	0.259	0.227
0.9833	0.259	0.222
1.0000	0.259	0.222
1.2000	0.259	0.186
1.4000	0.259	0.166
1.6000	0.259	0.156
1.8000	0.259	0.146
2.0000	0.259	0.151
2.2000	0.252	0.146
2.4000	0.252	0.146
2.6000	0.252	0.146
2.8000	0.252	0.141
3.0000	0.252	0.141
3.2000	0.252	0.146
3.4000	0.252	0.146
3.6000	0.252	0.146
3.8000	0.252	0.146
4.0000	0.252	0.146

001160.0219

4.2000	0.252	0.146
4.4000	0.252	0.146
4.6000	0.246	0.151
4.8000	0.246	0.146
5.0000	0.246	0.146
5.2000	0.246	0.146
5.4000	0.246	0.146
5.6000	0.246	0.146
5.8000	0.246	0.146
6.0000	0.246	0.146
6.2000	0.240	0.151
6.4000	0.240	0.151
6.6000	0.240	0.151
6.8000	0.240	0.151
7.0000	0.240	0.146
7.2000	0.240	0.151
7.4000	0.240	0.151
7.6000	0.240	0.156
7.8000	0.240	0.151
8.0000	0.240	0.151
8.2000	0.240	0.156
8.4000	0.240	0.151
8.6000	0.240	0.151
8.8000	0.240	0.151
9.0000	0.240	0.156
9.2000	0.240	0.151
9.4000	0.240	0.156
9.6000	0.233	0.151
9.8000	0.233	0.151
10.0000	0.233	0.156
12.0000	0.233	0.156
14.0000	0.227	0.131

001160.0220

SE2000
Environmental Logger
05/25 18:56

Unit# 404 Test 3

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~001~~ GP 027	MW-~~002~~ GP 028
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.000
Scale factor	20.010	16.000
Offset	-0.038	4.000
Delay mSEC	50.000	50.000

Step 1 05/24 15:37:15

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.031	-0.146
0.0083	0.044	-1.993
0.0166	-0.543	-1.494
0.0250	-0.644	-1.236
0.0333	-0.802	-1.408
0.0416	-1.188	-1.796
0.0500	-1.017	-2.478
0.0583	-0.904	-2.296
0.0666	-0.992	-2.215
0.0750	-0.897	-2.145
0.0833	-0.872	-2.059
0.0916	-0.866	-1.998
0.1000	-0.821	-1.958
0.1083	-0.809	-1.902
0.1166	-0.790	-1.801
0.1250	-0.758	-1.741
0.1333	-0.746	-1.665
0.1416	-0.720	-1.781
0.1500	-0.701	-1.610
0.1583	-0.682	-1.549
0.1666	-0.663	-1.549
0.1750	-0.644	-1.468
0.1833	-0.632	-1.433
0.1916	-0.613	-1.352
0.2000	-0.594	-1.297
0.2083	-0.581	-1.271
0.2166	-0.562	-1.221
0.2250	-0.550	-1.186
0.2333	-0.537	-1.276
0.2416	-0.524	-1.100
0.2500	-0.512	-1.105
0.2583	-0.499	-1.070
0.2666	-0.486	-1.034
0.2750	-0.480	-1.004
0.2833	-0.467	-0.969
0.2916	-0.461	-0.948

001160.0221

0.3000	-0.455	-0.913
0.3083	-0.442	-0.888
0.3166	-0.436	-0.858
0.3250	-0.429	-0.832
0.3333	-0.423	-0.807
0.3500	-0.404	-0.757
0.3666	-0.398	-0.716
0.3833	-0.385	-0.666
0.4000	-0.373	-0.625
0.4166	-0.366	-0.585
0.4333	-0.360	-0.550
0.4500	-0.354	-0.519
0.4666	-0.341	-0.489
0.4833	-0.341	-0.454
0.5000	-0.328	-0.423
0.5166	-0.328	-0.398
0.5333	-0.316	-0.373
0.5500	-0.316	-0.343
0.5666	-0.309	-0.323
0.5833	-0.303	-0.302
0.6000	-0.297	-0.277
0.6166	-0.290	-0.262
0.6333	-0.290	-0.242
0.6500	-0.284	-0.227
0.6666	-0.278	-0.211
0.6833	-0.278	-0.196
0.7000	-0.271	-0.181
0.7166	-0.265	-0.166
0.7333	-0.265	-0.151
0.7500	-0.259	-0.141
0.7666	-0.259	-0.131
0.7833	-0.252	-0.121
0.8000	-0.252	-0.105
0.8166	-0.246	-0.100
0.8333	-0.246	-0.090
0.8500	-0.240	-0.080
0.8666	-0.240	-0.075
0.8833	-0.233	-0.065
0.9000	-0.233	-0.055
0.9166	-0.233	-0.045
0.9333	-0.233	-0.040
0.9500	-0.227	-0.035
0.9666	-0.227	-0.030
0.9833	-0.221	-0.020
1.0000	-0.221	-0.015
1.2000	-0.202	0.035
1.4000	-0.183	0.060
1.6000	-0.170	0.075
1.8000	-0.164	0.085
2.0000	-0.158	0.095
2.2000	-0.151	0.100
2.4000	-0.145	0.105
2.6000	-0.139	0.100
2.8000	-0.139	0.105
3.0000	-0.139	0.105
3.2000	-0.132	0.105
3.4000	-0.132	0.105
3.6000	-0.132	0.111
3.8000	-0.132	0.111
4.0000	-0.126	0.111

001160.0222

4.2000	-0.132	0.116
4.4000	-0.132	0.116
4.6000	-0.132	0.111
4.8000	-0.126	0.111
5.0000	-0.132	0.111
5.2000	-0.126	0.111
5.4000	-0.126	0.111
5.6000	-0.126	0.111
5.8000	-0.126	0.111
6.0000	-0.126	0.111
6.2000	-0.126	0.116
6.4000	-0.126	0.116
6.6000	-0.126	0.111
6.8000	-0.126	0.111
7.0000	-0.126	0.111
7.2000	-0.120	0.116
7.4000	-0.120	0.116
7.6000	-0.120	0.116
7.8000	-0.120	0.116
8.0000	-0.120	0.116
8.2000	-0.120	0.116
8.4000	-0.120	0.111
8.6000	-0.120	0.116
8.8000	-0.120	0.121
9.0000	-0.113	0.116
9.2000	-0.113	0.116
9.4000	-0.113	0.116
9.6000	-0.113	0.116
9.8000	-0.113	0.116
10.0000	-0.113	0.116
12.0000	-0.107	0.116

001160.0223

SE2000
Environmental Logger
05/25 19:03

Unit# 404 Test 5

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-029	MW-030
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 0 05/25 06:55:50

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	0.006
0.0083	0.000	2.138
0.0166	0.006	1.702
0.0250	0.006	1.157
0.0333	0.006	1.554
0.0416	0.531	1.226
0.0500	1.062	1.343
0.0583	1.625	1.337
0.0666	1.403	1.299
0.0750	-0.082	1.286
0.0833	0.600	1.270
0.0916	0.360	1.258
0.1000	0.284	1.248
0.1083	0.328	1.239
0.1166	0.259	1.229
0.1250	0.271	1.226
0.1333	0.240	1.214
0.1416	0.233	1.207
0.1500	0.221	1.198
0.1583	0.208	1.188
0.1666	0.196	1.179
0.1750	0.189	1.173
0.1833	0.183	1.160
0.1916	0.177	1.151
0.2000	0.164	1.141
0.2083	0.158	1.132
0.2166	0.151	1.122
0.2250	0.145	1.113
0.2333	0.132	1.103
0.2416	0.126	1.097
0.2500	0.126	1.087
0.2583	0.120	1.078
0.2666	0.113	1.069
0.2750	0.107	1.062
0.2833	0.101	1.056
0.2916	0.101	1.046

001160.0224

0.3000	0.094	1.037
0.3083	0.088	1.031
0.3166	0.088	1.021
0.3250	0.082	1.015
0.3333	0.075	1.005
0.3500	0.069	0.990
0.3666	0.063	0.977
0.3833	0.063	0.961
0.4000	0.056	0.949
0.4166	0.050	0.936
0.4333	0.050	0.920
0.4500	0.044	0.905
0.4666	0.044	0.895
0.4833	0.044	0.882
0.5000	0.037	0.870
0.5166	0.031	0.854
0.5333	0.031	0.845
0.5500	0.031	0.832
0.5666	0.031	0.819
0.5833	0.025	0.810
0.6000	0.025	0.797
0.6166	0.025	0.785
0.6333	0.025	0.775
0.6500	0.025	0.763
0.6666	0.025	0.753
0.6833	0.025	0.744
0.7000	0.018	0.734
0.7166	0.025	0.722
0.7333	0.018	0.712
0.7500	0.018	0.703
0.7666	0.018	0.693
0.7833	0.018	0.684
0.8000	0.012	0.674
0.8166	0.012	0.665
0.8333	0.012	0.655
0.8500	0.018	0.646
0.8666	0.012	0.640
0.8833	0.012	0.630
0.9000	0.012	0.621
0.9166	0.012	0.614
0.9333	0.012	0.605
0.9500	0.012	0.599
0.9666	0.012	0.589
0.9833	0.012	0.580
1.0000	0.012	0.573
1.2000	0.006	0.488
1.4000	0.006	0.416
1.6000	0.006	0.362
1.8000	0.000	0.315
2.0000	0.006	0.274
2.2000	0.006	0.239
2.4000	0.006	0.211
2.6000	0.000	0.186
2.8000	0.006	0.163
3.0000	0.006	0.145
3.2000	0.000	0.132
3.4000	0.000	0.119
3.6000	0.000	0.107
3.8000	0.006	0.097
4.0000	0.000	0.088

001160.0225

4.2000	0.000	0.078
4.4000	0.006	0.072
4.6000	0.006	0.066
4.8000	0.006	0.063
5.0000	0.006	0.056
5.2000	0.006	0.053
5.4000	0.000	0.047
5.6000	0.000	0.040
5.8000	0.000	0.047
6.0000	0.000	0.040
6.2000	0.006	0.025
6.4000	0.000	0.047
6.6000	0.000	0.037
6.8000	0.006	0.034

001160.0226

SE2000
Environmental Logger
05/25 19:06

Unit# 404 Test 5

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-029	MW-030
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 1 05/25 07:02:41

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	0.151
0.0083	-0.524	-2.188
0.0166	0.227	-1.791
0.0250	0.082	-1.586
0.0333	-0.480	-1.582
0.0416	-0.746	-1.554
0.0500	-0.821	-1.538
0.0583	-0.809	-1.523
0.0666	-0.714	-1.507
0.0750	-0.676	-1.494
0.0833	-0.625	-1.482
0.0916	-0.569	-1.469
0.1000	-0.524	-1.459
0.1083	-0.486	-1.447
0.1166	-0.448	-1.434
0.1250	-0.417	-1.425
0.1333	-0.392	-1.415
0.1416	-0.360	-1.403
0.1500	-0.335	-1.393
0.1583	-0.316	-1.384
0.1666	-0.290	-1.374
0.1750	-0.265	-1.365
0.1833	-0.252	-1.355
0.1916	-0.233	-1.346
0.2000	-0.221	-1.340
0.2083	-0.208	-1.330
0.2166	-0.196	-1.321
0.2250	-0.183	-1.311
0.2333	-0.177	-1.302
0.2416	-0.170	-1.295
0.2500	-0.158	-1.286
0.2583	-0.151	-1.277
0.2666	-0.145	-1.270
0.2750	-0.139	-1.261
0.2833	-0.132	-1.251
0.2916	-0.126	-1.242

0.3000	-0.120	-1.239
0.3083	-0.113	-1.229
0.3166	-0.107	-1.220
0.3250	-0.101	-1.214
0.3333	-0.101	-1.207
0.3500	-0.094	-1.188
0.3666	-0.088	-1.176
0.3833	-0.082	-1.160
0.4000	-0.069	-1.144
0.4166	-0.069	-1.128
0.4333	-0.063	-1.116
0.4500	-0.056	-1.100
0.4666	-0.056	-1.087
0.4833	-0.056	-1.075
0.5000	-0.050	-1.059
0.5166	-0.050	-1.046
0.5333	-0.044	-1.034
0.5500	-0.044	-1.021
0.5666	-0.044	-1.009
0.5833	-0.037	-0.996
0.6000	-0.037	-0.983
0.6166	-0.037	-0.971
0.6333	-0.037	-0.958
0.6500	-0.031	-0.945
0.6666	-0.031	-0.936
0.6833	-0.031	-0.923
0.7000	-0.025	-0.911
0.7166	-0.025	-0.901
0.7333	-0.025	-0.892
0.7500	-0.025	-0.879
0.7666	-0.025	-0.867
0.7833	-0.025	-0.857
0.8000	-0.018	-0.848
0.8166	-0.025	-0.835
0.8333	-0.018	-0.826
0.8500	-0.018	-0.816
0.8666	-0.018	-0.807
0.8833	-0.018	-0.794
0.9000	-0.018	-0.785
0.9166	-0.018	-0.775
0.9333	-0.012	-0.766
0.9500	-0.018	-0.756
0.9666	-0.012	-0.747
0.9833	-0.012	-0.737
1.0000	-0.012	-0.728
1.2000	-0.012	-0.624
1.4000	-0.012	-0.539
1.6000	-0.006	-0.463
1.8000	-0.006	-0.400
2.0000	-0.006	-0.346
2.2000	0.000	-0.299
2.4000	0.000	-0.258
2.6000	0.000	-0.223
2.8000	0.000	-0.195
3.0000	0.000	-0.170
3.2000	0.000	-0.148
3.4000	0.000	-0.129
3.6000	0.000	-0.110
3.8000	0.000	-0.097
4.0000	0.000	-0.085

001160.0228

4.2000	0.000	-0.072

001160.0229

SE2000
Environmental Logger
05/25 19:10

Unit# 404 Test 6

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-031	MW-032
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 0 05/25 07:27:35

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.018	0.009
0.0083	0.012	0.009
0.0166	0.018	0.558
0.0250	0.031	1.750
0.0333	0.006	1.715
0.0416	0.018	1.232
0.0500	0.992	1.415
0.0583	0.632	1.267
0.0666	0.581	1.217
0.0750	0.701	1.150
0.0833	0.486	1.109
0.0916	0.511	1.059
0.1000	0.442	1.002
0.1083	0.442	0.964
0.1166	0.417	0.917
0.1250	0.398	0.879
0.1333	0.398	0.841
0.1416	0.379	0.804
0.1500	0.385	0.769
0.1583	0.385	0.734
0.1666	0.379	0.700
0.1750	0.372	0.668
0.1833	0.372	0.640
0.1916	0.366	0.608
0.2000	0.366	0.583
0.2083	0.360	0.554
0.2166	0.360	0.532
0.2250	0.347	0.507
0.2333	0.360	0.485
0.2416	0.360	0.466
0.2500	0.341	0.444
0.2583	0.360	0.425
0.2666	0.353	0.406
0.2750	0.341	0.391
0.2833	0.353	0.372
0.2916	0.353	0.356

001160.0230

0.3000	0.353	0.340
0.3083	0.341	0.327
0.3166	0.353	0.312
0.3250	0.353	0.302
0.3333	0.353	0.286
0.3500	0.353	0.264
0.3666	0.353	0.242
0.3833	0.353	0.223
0.4000	0.353	0.204
0.4166	0.353	0.192
0.4333	0.353	0.176
0.4500	0.353	0.163
0.4666	0.353	0.151
0.4833	0.353	0.141
0.5000	0.353	0.129
0.5166	0.353	0.122
0.5333	0.353	0.113
0.5500	0.353	0.104
0.5666	0.347	0.097
0.5833	0.353	0.091
0.6000	0.353	0.085
0.6166	0.353	0.081
0.6333	0.353	0.075
0.6500	0.353	0.072
0.6666	0.353	0.069
0.6833	0.353	0.063
0.7000	0.341	0.059
0.7166	0.347	0.056
0.7333	0.353	0.053
0.7500	0.353	0.050
0.7666	0.353	0.050
0.7833	0.347	0.047
0.8000	0.347	0.044
0.8166	0.353	0.044
0.8333	0.353	0.040
0.8500	0.347	0.040
0.8666	0.334	0.037
0.8833	0.353	0.037
0.9000	0.334	0.034
0.9166	0.353	0.034
0.9333	0.347	0.031
0.9500	0.347	0.031
0.9666	0.347	0.031
0.9833	0.347	0.028
1.0000	0.353	0.028
1.2000	0.347	0.022
1.4000	0.347	0.018
1.6000	0.347	0.015
1.8000	0.347	0.015
2.0000	0.347	0.015
2.2000	0.347	0.012
2.4000	0.347	0.012
2.6000	0.347	0.012
2.8000	0.347	0.012
3.0000	0.341	0.012
3.2000	0.341	0.012
3.4000	0.341	0.009
3.6000	0.341	0.009
3.8000	0.341	0.012
4.0000	0.334	0.009

001160.0231

4.2000	0.341	0.009
4.4000	0.334	0.009
4.6000	0.334	0.009
4.8000	0.341	0.009
5.0000	0.334	0.009
5.2000	0.334	0.009
5.4000	0.328	0.009
5.6000	0.334	0.009
5.8000	0.334	0.009
6.0000	0.334	0.009
6.2000	0.334	0.009
6.4000	0.334	0.009
6.6000	0.334	0.009
6.8000	0.328	0.009
7.0000	0.322	0.009
7.2000	0.334	0.009
7.4000	0.328	0.009
7.6000	0.328	0.009
7.8000	0.328	0.009
8.0000	0.328	0.009
8.2000	0.328	0.009
8.4000	0.316	0.009
8.6000	0.328	0.009
8.8000	0.328	0.009
9.0000	0.328	0.006
9.2000	0.328	0.009
9.4000	0.328	0.009
9.6000	0.328	0.009
9.8000	0.328	0.006
10.0000	0.322	0.009
12.0000	0.309	0.006
14.0000	0.322	0.006
16.0000	0.316	0.006
18.0000	0.297	0.006
20.0000	0.309	0.009
22.0000	0.309	0.006
24.0000	0.309	0.009
26.0000	0.309	0.009
28.0000	0.303	0.006
30.0000	0.309	0.006
32.0000	0.303	0.009
34.0000	0.303	0.006
36.0000	0.297	0.006
38.0000	0.284	0.009

001160.0232

SE2000
Environmental Logger
05/25 19:12

Unit# 404 Test 6

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-031	MW-032
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 1 05/25 08:07:18

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.233	-0.009
0.0083	-0.202	-2.068
0.0166	-0.530	-1.450
0.0250	-0.733	-1.595
0.0333	-0.764	-1.563
0.0416	-0.752	-1.428
0.0500	-0.720	-1.428
0.0583	-0.701	-1.295
0.0666	-0.682	-1.232
0.0750	-0.657	-1.172
0.0833	-0.638	-1.116
0.0916	-0.619	-1.062
0.1000	-0.600	-1.012
0.1083	-0.581	-0.961
0.1166	-0.568	-0.917
0.1250	-0.549	-0.873
0.1333	-0.537	-0.832
0.1416	-0.518	-0.791
0.1500	-0.505	-0.753
0.1583	-0.492	-0.718
0.1666	-0.473	-0.687
0.1750	-0.461	-0.655
0.1833	-0.448	-0.624
0.1916	-0.436	-0.595
0.2000	-0.423	-0.567
0.2083	-0.410	-0.542
0.2166	-0.398	-0.520
0.2250	-0.391	-0.495
0.2333	-0.379	-0.472
0.2416	-0.366	-0.450
0.2500	-0.360	-0.431
0.2583	-0.347	-0.413
0.2666	-0.334	-0.394
0.2750	-0.328	-0.378
0.2833	-0.315	-0.359
0.2916	-0.309	-0.343

001160.0233

0.3000	-0.303	-0.331
0.3083	-0.309	-0.315
0.3166	-0.297	-0.302
0.3250	-0.278	-0.286
0.3333	-0.271	-0.277
0.3500	-0.259	-0.255
0.3666	-0.246	-0.233
0.3833	-0.233	-0.214
0.4000	-0.227	-0.195
0.4166	-0.214	-0.179
0.4333	-0.208	-0.163
0.4500	-0.195	-0.154
0.4666	-0.202	-0.141
0.4833	-0.183	-0.132
0.5000	-0.176	-0.119
0.5166	-0.170	-0.110
0.5333	-0.164	-0.100
0.5500	-0.157	-0.094
0.5666	-0.151	-0.088
0.5833	-0.151	-0.081
0.6000	-0.145	-0.075
0.6166	-0.145	-0.069
0.6333	-0.145	-0.066
0.6500	-0.139	-0.059
0.6666	-0.145	-0.056
0.6833	-0.126	-0.053
0.7000	-0.132	-0.047
0.7166	-0.120	-0.044
0.7333	-0.120	-0.040
0.7500	-0.126	-0.040
0.7666	-0.126	-0.037
0.7833	-0.113	-0.034
0.8000	-0.113	-0.034
0.8166	-0.107	-0.031
0.8333	-0.101	-0.031
0.8500	-0.113	-0.028
0.8666	-0.101	-0.028
0.8833	-0.094	-0.025
0.9000	-0.094	-0.022
0.9166	-0.094	-0.022
0.9333	-0.088	-0.022
0.9500	-0.088	-0.022
0.9666	-0.088	-0.018
0.9833	-0.082	-0.018
1.0000	-0.082	-0.015
1.2000	-0.063	-0.009
1.4000	-0.050	-0.006
1.6000	-0.037	-0.006
1.8000	-0.025	-0.006
2.0000	-0.018	-0.003
2.2000	-0.006	-0.003
2.4000	-0.012	-0.003
2.6000	0.006	-0.003
2.8000	0.018	-0.003
3.0000	0.025	0.000
3.2000	0.031	0.000
3.4000	0.031	0.000
3.6000	0.025	0.000
3.8000	0.044	0.000
4.0000	0.050	0.000

001160.0234

4.2000	0.056	0.003
4.4000	0.056	0.000
4.6000	0.063	0.000
4.8000	0.069	0.003
5.0000	0.075	0.000
5.2000	0.075	0.000
5.4000	0.082	0.000
5.6000	0.082	0.003
5.8000	0.088	0.003
6.0000	0.088	0.003
6.2000	0.094	0.003
6.4000	0.094	0.000
6.6000	0.088	0.000
6.8000	0.094	0.003
7.0000	0.107	0.003
7.2000	0.107	0.003
7.4000	0.113	0.003
7.6000	0.113	0.003
7.8000	0.113	0.003
8.0000	0.101	0.003

001160.0235

SE2000
Environmental Logger
05/25 19:14

Unit# 404 Test 7

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~043~~ 033 JP	MW-~~044~~ 034 JP
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 0 05/25 08:59:27

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	-0.006
0.0083	0.031	2.488
0.0166	0.056	2.137
0.0250	0.316	2.062
0.0333	2.208	1.459
0.0416	1.733	1.210
0.0500	1.784	1.819
0.0583	0.639	1.841
0.0666	0.297	1.743
0.0750	1.056	1.819
0.0833	0.373	1.772
0.0916	0.449	1.816
0.1000	0.626	1.775
0.1083	0.341	1.803
0.1166	0.455	1.791
0.1250	0.417	1.791
0.1333	0.347	1.794
0.1416	0.392	1.791
0.1500	0.335	1.791
0.1583	0.335	1.791
0.1666	0.335	1.794
0.1750	0.316	1.787
0.1833	0.316	1.794
0.1916	0.303	1.791
0.2000	0.303	1.787
0.2083	0.303	1.775
0.2166	0.297	1.816
0.2250	0.297	1.800
0.2333	0.297	1.794
0.2416	0.291	1.769
0.2500	0.291	1.794
0.2583	0.291	1.794
0.2666	0.284	1.803
0.2750	0.291	1.794
0.2833	0.291	1.797
0.2916	0.284	1.794

001160.0236

0.3000	0.284	1.794
0.3083	0.284	1.794
0.3166	0.278	1.794
0.3250	0.284	1.797
0.3333	0.278	1.794
0.3500	0.284	1.794
0.3666	0.278	1.794
0.3833	0.278	1.797
0.4000	0.278	1.794
0.4166	0.278	1.791
0.4333	0.272	1.791
0.4500	0.272	1.791
0.4666	0.272	1.791
0.4833	0.278	1.794
0.5000	0.272	1.794
0.5166	0.272	1.794
0.5333	0.272	1.794
0.5500	0.272	1.791
0.5666	0.272	1.794
0.5833	0.265	1.794
0.6000	0.272	1.794
0.6166	0.272	1.791
0.6333	0.272	1.791
0.6500	0.272	1.791
0.6666	0.272	1.791
0.6833	0.265	1.791
0.7000	0.265	1.791
0.7166	0.265	1.794
0.7333	0.265	1.787
0.7500	0.265	1.791
0.7666	0.265	1.794
0.7833	0.265	1.794
0.8000	0.265	1.791
0.8166	0.265	1.791
0.8333	0.265	1.791
0.8500	0.265	1.791
0.8666	0.259	1.797
0.8833	0.265	1.791
0.9000	0.265	1.803
0.9166	0.265	1.794
0.9333	0.265	1.772
0.9500	0.265	1.787
0.9666	0.265	1.787
0.9833	0.265	1.784
1.0000	0.259	1.797
1.2000	0.259	1.791
1.4000	0.253	1.787
1.6000	0.259	1.794
1.8000	0.253	1.791
2.0000	0.246	1.791
2.2000	0.246	1.791
2.4000	0.240	1.791
2.6000	0.240	1.787
2.8000	0.246	1.791
3.0000	0.240	1.794
3.2000	0.240	1.794
3.4000	0.240	1.791
3.6000	0.240	1.791
3.8000	0.234	1.787
4.0000	0.234	1.787

001160.0237

SE2000
Environmental Logger
05/25 19:17

Unit# 404 Test 7

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~043~~ DP 033	MW-~~044~~ DP 034
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 1 05/25 09:43:03

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.183	-0.409
0.0083	0.202	-1.494
0.0166	-0.354	0.050
0.0250	-0.404	0.302
0.0333	-0.385	-0.009
0.0416	-0.803	-0.255
0.0500	-0.778	-0.176
0.0583	-0.778	-0.025
0.0666	-0.771	-0.031
0.0750	-0.765	-0.088
0.0833	-0.765	-0.104
0.0916	-0.759	-0.078
0.1000	-0.752	-0.066
0.1083	-0.746	-0.069
0.1166	-0.740	-0.078
0.1250	-0.733	-0.075
0.1333	-0.721	-0.072
0.1416	-0.721	-0.072
0.1500	-0.689	-0.072
0.1583	-0.676	-0.072
0.1666	-0.657	-0.072
0.1750	-0.645	-0.072
0.1833	-0.626	-0.072
0.1916	-0.613	-0.072
0.2000	-0.600	-0.072
0.2083	-0.582	-0.069
0.2166	-0.569	-0.072
0.2250	-0.556	-0.072
0.2333	-0.544	-0.069
0.2416	-0.531	-0.069
0.2500	-0.512	-0.072
0.2583	-0.499	-0.069
0.2666	-0.487	-0.069
0.2750	-0.480	-0.072
0.2833	-0.461	-0.072
0.2916	-0.455	-0.072

001160.0238

0.3000	-0.442	-0.069
0.3083	-0.430	-0.069
0.3166	-0.423	-0.069
0.3250	-0.411	-0.069
0.3333	-0.398	-0.069
0.3500	-0.379	-0.069
0.3666	-0.360	-0.069
0.3833	-0.341	-0.069
0.4000	-0.328	-0.069
0.4166	-0.309	-0.069
0.4333	-0.297	-0.069
0.4500	-0.284	-0.066
0.4666	-0.272	-0.069
0.4833	-0.259	-0.066
0.5000	-0.253	-0.066
0.5166	-0.240	-0.066
0.5333	-0.234	-0.066
0.5500	-0.227	-0.066
0.5666	-0.215	-0.066
0.5833	-0.208	-0.066
0.6000	-0.202	-0.066
0.6166	-0.196	-0.066
0.6333	-0.183	-0.066
0.6500	-0.183	-0.066
0.6666	-0.177	-0.066
0.6833	-0.170	-0.066
0.7000	-0.164	-0.066
0.7166	-0.158	-0.066
0.7333	-0.151	-0.066
0.7500	-0.145	-0.063
0.7666	-0.145	-0.066
0.7833	-0.139	-0.066
0.8000	-0.132	-0.063
0.8166	-0.132	-0.066
0.8333	-0.126	-0.066
0.8500	-0.126	-0.066
0.8666	-0.120	-0.066
0.8833	-0.120	-0.063
0.9000	-0.113	-0.066
0.9166	-0.113	-0.066
0.9333	-0.107	-0.063
0.9500	-0.107	-0.063
0.9666	-0.101	-0.063
0.9833	-0.101	-0.063
1.0000	-0.094	-0.063
1.2000	-0.069	-0.059
1.4000	-0.050	-0.059
1.6000	-0.031	-0.056
1.8000	-0.025	-0.056
2.0000	-0.012	-0.056
2.2000	-0.012	-0.056
2.4000	-0.006	-0.053
2.6000	0.000	-0.053
2.8000	0.000	-0.053
3.0000	0.000	-0.050
3.2000	0.000	-0.050
3.4000	0.006	-0.050
3.6000	0.000	-0.050
3.8000	0.006	-0.047
4.0000	0.006	-0.040

001160.0239

4.2000	0.006	-0.040
4.4000	0.006	-0.044
4.6000	0.006	-0.044
4.8000	0.006	-0.040
5.0000	0.006	-0.040
5.2000	0.012	-0.037
5.4000	0.012	-0.037
5.6000	0.012	-0.034
5.8000	0.006	-0.037
6.0000	0.012	-0.034
6.2000	0.012	-0.034
6.4000	0.012	-0.031
6.6000	0.012	-0.031
6.8000	0.012	-0.031
7.0000	0.012	-0.031
7.2000	0.012	-0.028
7.4000	0.012	-0.031
7.6000	0.012	-0.028
7.8000	0.012	-0.025
8.0000	0.012	-0.022
8.2000	0.012	-0.022
8.4000	0.012	-0.025
8.6000	0.012	-0.022
8.8000	0.012	-0.022
9.0000	0.012	-0.022
9.2000	0.012	-0.015
9.4000	0.012	-0.015
9.6000	0.012	-0.015
9.8000	0.012	-0.015
10.0000	0.018	-0.012
12.0000	0.012	-0.003

001160.0240

SE2000
Environmental Logger
05/25 19:56

Unit# 404 Test 13

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-036
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 0 05/25 16:25:27

Elapsed Time	INPUT 1
0.0000	0.006
0.0083	0.031
0.0166	1.087
0.0250	1.321
0.0333	1.005
0.0416	1.036
0.0500	1.024
0.0583	1.024
0.0666	1.024
0.0750	1.024
0.0833	1.024
0.0916	1.024
0.1000	1.024
0.1083	1.024
0.1166	1.024
0.1250	1.024
0.1333	1.018
0.1416	1.018
0.1500	1.018
0.1583	1.018
0.1666	1.018
0.1750	1.018
0.1833	1.018
0.1916	1.018
0.2000	1.018
0.2083	1.018
0.2166	1.018
0.2250	1.018
0.2333	1.018
0.2416	1.018
0.2500	1.018
0.2583	1.018
0.2666	1.018
0.2750	1.018
0.2833	1.018
0.2916	1.018

001160.0241

0.3000	1.018
0.3083	1.018
0.3166	1.018
0.3250	1.018
0.3333	1.018
0.3500	1.018
0.3666	1.011
0.3833	1.018
0.4000	1.018
0.4166	1.018
0.4333	1.011
0.4500	1.011
0.4666	1.011
0.4833	1.011
0.5000	1.011
0.5166	1.011
0.5333	1.011
0.5500	1.011
0.5666	1.011
0.5833	1.011
0.6000	1.011
0.6166	1.011
0.6333	1.011
0.6500	1.011
0.6666	1.011
0.6833	1.011
0.7000	1.011
0.7166	1.011
0.7333	1.011
0.7500	1.011
0.7666	1.011
0.7833	1.011
0.8000	1.011
0.8166	1.011
0.8333	1.011
0.8500	1.011
0.8666	1.011
0.8833	1.011
0.9000	1.011
0.9166	1.011
0.9333	1.011
0.9500	1.011
0.9666	1.011
0.9833	1.011
1.0000	1.011
1.2000	1.011
1.4000	0.569
1.6000	0.562
1.8000	0.569
2.0000	0.562
2.2000	0.562
2.4000	0.562
2.6000	0.562
2.8000	0.562
3.0000	0.562
3.2000	0.562
3.4000	0.562
3.6000	0.562
3.8000	0.562
4.0000	0.562

001160.0242

4.2000	0.562
4.4000	0.562
4.6000	0.556
4.8000	0.562
5.0000	0.562
5.2000	0.562
5.4000	0.556
5.6000	0.556
5.8000	0.562
6.0000	0.556
6.2000	0.562
6.4000	0.562
6.6000	0.562
6.8000	0.556
7.0000	0.550
7.2000	0.556
7.4000	0.550
7.6000	0.556
7.8000	0.556
8.0000	0.556
8.2000	0.550
8.4000	0.556
8.6000	0.556
8.8000	0.550
9.0000	0.556
9.2000	0.556
9.4000	0.550
9.6000	0.550
9.8000	0.550
10.0000	0.550

001160.0243

SE2000
Environmental Logger
05/25 19:58

Unit# 404 Test 13

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-036
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 1 05/25 16:37:20

Elapsed Time	INPUT 1
0.0000	0.556
0.0083	-0.170
0.0166	-0.524
0.0250	-0.752
0.0333	-0.727
0.0416	-0.720
0.0500	-0.720
0.0583	-0.714
0.0666	-0.714
0.0750	-0.708
0.0833	-0.708
0.0916	-0.701
0.1000	-0.695
0.1083	-0.695
0.1166	-0.689
0.1250	-0.682
0.1333	-0.676
0.1416	-0.670
0.1500	-0.663
0.1583	-0.657
0.1666	-0.651
0.1750	-0.644
0.1833	-0.638
0.1916	-0.632
0.2000	-0.625
0.2083	-0.619
0.2166	-0.613
0.2250	-0.606
0.2333	-0.600
0.2416	-0.594
0.2500	-0.587
0.2583	-0.581
0.2666	-0.575
0.2750	-0.562
0.2833	-0.562
0.2916	-0.556

001160.0244

0.3000	-0.550
0.3083	-0.543
0.3166	-0.537
0.3250	-0.531
0.3333	-0.524
0.3500	-0.512
0.3666	-0.505
0.3833	-0.486
0.4000	-0.480
0.4166	-0.467
0.4333	-0.461
0.4500	-0.448
0.4666	-0.436
0.4833	-0.429
0.5000	-0.423
0.5166	-0.410
0.5333	-0.404
0.5500	-0.391
0.5666	-0.385
0.5833	-0.373
0.6000	-0.373
0.6166	-0.360
0.6333	-0.354
0.6500	-0.347
0.6666	-0.341
0.6833	-0.335
0.7000	-0.322
0.7166	-0.316
0.7333	-0.309
0.7500	-0.303
0.7666	-0.297
0.7833	-0.290
0.8000	-0.284
0.8166	-0.278
0.8333	-0.271
0.8500	-0.265
0.8666	-0.265
0.8833	-0.259
0.9000	-0.252
0.9166	-0.246
0.9333	-0.240
0.9500	-0.240
0.9666	-0.233
0.9833	-0.227
1.0000	-0.221
1.2000	-0.183
1.4000	-0.151
1.6000	-0.126
1.8000	-0.113
2.0000	-0.101
2.2000	-0.088
2.4000	-0.088
2.6000	-0.082
2.8000	-0.075
3.0000	-0.075
3.2000	-0.069
3.4000	-0.063
3.6000	-0.056
3.8000	-0.056
4.0000	-0.056

001160.0245

4.2000	-0.056
4.4000	-0.056
4.6000	-0.050
4.8000	-0.050
5.0000	-0.044
5.2000	-0.050
5.4000	-0.044
5.6000	-0.044
5.8000	-0.044
6.0000	-0.044
6.2000	-0.044
6.4000	-0.044
6.6000	-0.037
6.8000	-0.037
7.0000	-0.031
7.2000	-0.031
7.4000	-0.031
7.6000	-0.031
7.8000	-0.031
8.0000	-0.025
8.2000	-0.031
8.4000	-0.025

001160.0246

SE2000
Environmental Logger
05/25 19:32

Unit# 404 Test 10

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-~~040~~ 038
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 0 05/25 13:58:36

Elapsed Time	INPUT 1
0.0000	0.006
0.0083	0.018
0.0166	2.010
0.0250	0.746
0.0333	0.537
0.0416	0.682
0.0500	0.550
0.0583	0.429
0.0666	0.410
0.0750	0.322
0.0833	0.404
0.0916	0.404
0.1000	0.379
0.1083	0.385
0.1166	0.372
0.1250	0.372
0.1333	0.360
0.1416	0.360
0.1500	0.360
0.1583	0.354
0.1666	0.354
0.1750	0.347
0.1833	0.347
0.1916	0.347
0.2000	0.341
0.2083	0.341
0.2166	0.341
0.2250	0.341
0.2333	0.335
0.2416	0.335
0.2500	0.335
0.2583	0.328
0.2666	0.328
0.2750	0.328
0.2833	0.322
0.2916	0.322

001160.0247

0.3000	0.322
0.3083	0.322
0.3166	0.322
0.3250	0.316
0.3333	0.316
0.3500	0.316
0.3666	0.316
0.3833	0.309
0.4000	0.309
0.4166	0.303
0.4333	0.303
0.4500	0.303
0.4666	0.297
0.4833	0.297
0.5000	0.290
0.5166	0.290
0.5333	0.290
0.5500	0.284
0.5666	0.284
0.5833	0.284
0.6000	0.278
0.6166	0.278
0.6333	0.271
0.6500	0.271
0.6666	0.271
0.6833	0.265
0.7000	0.271
0.7166	0.265
0.7333	0.265
0.7500	0.265
0.7666	0.259
0.7833	0.259
0.8000	0.259
0.8166	0.252
0.8333	0.252
0.8500	0.252
0.8666	0.252
0.8833	0.246
0.9000	0.246
0.9166	0.240
0.9333	0.240
0.9500	0.240
0.9666	0.240
0.9833	0.233
1.0000	0.233
1.2000	0.214
1.4000	0.195
1.6000	0.183
1.8000	0.170
2.0000	0.158
2.2000	0.145
2.4000	0.132
2.6000	0.126
2.8000	0.120
3.0000	0.113
3.2000	0.101
3.4000	0.094
3.6000	0.088
3.8000	0.082
4.0000	0.075

001160.0248

4.2000	0.075
4.4000	0.069
4.6000	0.063
4.8000	0.063
5.0000	0.063
5.2000	0.056
5.4000	0.056
5.6000	0.050
5.8000	0.050
6.0000	0.044
6 2000	0.044
6.4000	0.044
6.6000	0.044
6.8000	0.037
7.0000	0.037
7.2000	0.031
7.4000	0.031
7.6000	0.031
7.8000	0.031
8.0000	0.031
8.2000	0.025
8.4000	0.025
8.6000	0.025
8.8000	0.025
9.0000	0.025
9.2000	0.018
9.4000	0.018
9.6000	0.018
9.8000	0.018
10.0000	0.018
12.0000	0.012
14.0000	0.006
16.0000	0.006

001160.0249

SE2000
Environmental Logger
05/25 19:36

Unit# 404 Test 10

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-~~040~~ DP D38
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 1 05/25 14:15:26

Elapsed Time	INPUT 1
0.0000	0.006
0.0083	-0.442
0.0166	0.537
0.0250	-2.041
0.0333	-1.769
0.0416	-1.441
0.0500	-1.308
0.0583	-1.257
0.0666	-1.226
0.0750	-1.207
0.0833	-1.175
0.0916	-1.144
0.1000	-1.118
0.1083	-1.087
0.1166	-1.061
0.1250	-1.030
0.1333	-1.005
0.1416	-0.979
0.1500	-0.954
0.1583	-0.929
0.1666	-0.910
0.1750	-0.884
0.1833	-0.859
0.1916	-0.840
0.2000	-0.815
0.2083	-0.796
0.2166	-0.771
0.2250	-0.752
0.2333	-0.733
0.2416	-0.714
0.2500	-0.695
0.2583	-0.676
0.2666	-0.657
0.2750	-0.644
0.2833	-0.625
0.2916	-0.606

001160.0250

0.3000	-0.594
0.3083	-0.581
0.3166	-0.562
0.3250	-0.549
0.3333	-0.537
0.3500	-0.512
0.3666	-0.486
0.3833	-0.461
0.4000	-0.448
0.4166	-0.429
0.4333	-0.410
0.4500	-0.398
0.4666	-0.385
0.4833	-0.372
0.5000	-0.360
0.5166	-0.347
0.5333	-0.341
0.5500	-0.335
0.5666	-0.328
0.5833	-0.322
0.6000	-0.309
0.6166	-0.309
0.6333	-0.303
0.6500	-0.297
0.6666	-0.290
0.6833	-0.284
0.7000	-0.284
0.7166	-0.278
0.7333	-0.278
0.7500	-0.271
0.7666	-0.271
0.7833	-0.265
0.8000	-0.265
0.8166	-0.259
0.8333	-0.259
0.8500	-0.259
0.8666	-0.259
0.8833	-0.252
0.9000	-0.252
0.9166	-0.252
0.9333	-0.246
0.9500	-0.246
0.9666	-0.246
0.9833	-0.240
1.0000	-0.240
1.2000	-0.214
1.4000	-0.189
1.6000	-0.170
1.8000	-0.151
2.0000	-0.139
2.2000	-0.126
2.4000	-0.113
2.6000	-0.101
2.8000	-0.094
3.0000	-0.088
3.2000	-0.082
3.4000	-0.075
3.6000	-0.069
3.8000	-0.063
4.0000	-0.063

001160.0251

4.2000	-0.056
4.4000	-0.056
4.6000	-0.050
4.8000	-0.044
5.0000	-0.044
5.2000	-0.037
5.4000	-0.037
5.6000	-0.037
5.8000	-0.037
6.0000	-0.031
6.2000	-0.031
6.4000	-0.031
6.6000	-0.025
6.8000	-0.025
7.0000	-0.025
7.2000	-0.025
7.4000	-0.025
7.6000	-0.018
7.8000	-0.018
8.0000	-0.018
8.2000	-0.018
8.4000	-0.018
8.6000	-0.018
8.8000	-0.012
9.0000	-0.012
9.2000	-0.018
9.4000	-0.012
9.6000	-0.012
9.8000	-0.006
10.0000	-0.018
12.0000	-0.012

SE2000
Environmental Logger
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Unit# 404 Test 12

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-040
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 0 05/25 15:32:41

Elapsed Time	INPUT 1
0.0000	0.006
0.0083	0.006
0.0166	1.352
0.0250	1.156
0.0333	1.118
0.0416	0.891
0.0500	0.878
0.0583	0.651
0.0666	0.619
0.0750	0.524
0.0833	0.518
0.0916	0.499
0.1000	0.480
0.1083	0.461
0.1166	0.455
0.1250	0.442
0.1333	0.436
0.1416	0.423
0.1500	0.417
0.1583	0.410
0.1666	0.404
0.1750	0.398
0.1833	0.391
0.1916	0.391
0.2000	0.385
0.2083	0.379
0.2166	0.372
0.2250	0.372
0.2333	0.366
0.2416	0.366
0.2500	0.366
0.2583	0.360
0.2666	0.353
0.2750	0.353
0.2833	0.353
0.2916	0.347

0.3000	0.347
0.3083	0.347
0.3166	0.341
0.3250	0.341
0.3333	0.341
0.3500	0.335
0.3666	0.328
0.3833	0.328
0.4000	0.328
0.4166	0.322
0.4333	0.316
0.4500	0.316
0.4666	0.316
0.4833	0.309
0.5000	0.309
0.5166	0.303
0.5333	0.303
0.5500	0.303
0.5666	0.303
0.5833	0.297
0.6000	0.297
0.6166	0.290
0.6333	0.290
0.6500	0.284
0.6666	0.284
0.6833	0.284
0.7000	0.284
0.7166	0.284
0.7333	0.278
0.7500	0.278
0.7666	0.278
0.7833	0.271
0.8000	0.271
0.8166	0.271
0.8333	0.271
0.8500	0.265
0.8666	0.265
0.8833	0.265
0.9000	0.259
0.9166	0.259
0.9333	0.259
0.9500	0.252
0.9666	0.252
0.9833	0.252
1.0000	0.246
1.2000	0.214
1.4000	0.195
1.6000	0.183
1.8000	0.170
2.0000	0.158
2.2000	0.151
2.4000	0.139
2.6000	0.132
2.8000	0.126
3.0000	0.120
3.2000	0.113
3.4000	0.107
3.6000	0.101
3.8000	0.101
4.0000	0.094

001160.0254

4.2000	0.088
4.4000	0.082
4.6000	0.075
4.8000	0.069
5.0000	0.069
5.2000	0.063
5.4000	0.063
5.6000	0.063
5.8000	0.056
6.0000	0.063
6.2000	0.063
6.4000	0.056
6.6000	0.050
6.8000	0.050
7.0000	0.050
7.2000	0.044
7.4000	0.044
7.6000	0.044
7.8000	0.044
8.0000	0.037
8.2000	0.037
8.4000	0.037
8.6000	0.037
8.8000	0.037
9.0000	0.031
9.2000	0.031
9.4000	0.031
9.6000	0.031
9.8000	0.031
10.0000	0.031

001160.0255

SE2000
Environmental Logger
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Unit# 404 Test 12

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-040
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 1 05/25 15:42:46

Elapsed Time	INPUT 1
0.0000	0.056
0.0083	-0.246
0.0166	-1.055
0.0250	-1.263
0.0333	-1.270
0.0416	-1.270
0.0500	-1.263
0.0583	-1.263
0.0666	-1.257
0.0750	-1.257
0.0833	-1.251
0.0916	-1.245
0.1000	-1.245
0.1083	-1.238
0.1166	-1.238
0.1250	-1.232
0.1333	-1.232
0.1416	-1.226
0.1500	-1.219
0.1583	-1.219
0.1666	-1.213
0.1750	-1.213
0.1833	-1.213
0.1916	-1.207
0.2000	-1.200
0.2083	-1.194
0.2166	-1.194
0.2250	-1.188
0.2333	-1.188
0.2416	-1.188
0.2500	-1.181
0.2583	-1.181
0.2666	-1.175
0.2750	-1.175
0.2833	-1.175
0.2916	-1.169

001160.0256

0.3000	-1.169
0.3083	-1.169
0.3166	-1.162
0.3250	-1.162
0.3333	-1.162
0.3500	-1.156
0.3666	-1.150
0.3833	-1.150
0.4000	-1.143
0.4166	-1.143
0.4333	-1.137
0.4500	-1.131
0.4666	-1.131
0.4833	-1.124
0.5000	-1.124
0.5166	-1.112
0.5333	-1.112
0.5500	-1.112
0.5666	-1.106
0.5833	-1.099
0.6000	-1.099
0.6166	-1.093
0.6333	-1.087
0.6500	-1.087
0.6666	-1.080
0.6833	-1.080
0.7000	-1.074
0.7166	-1.068
0.7333	-1.068
0.7500	-1.061
0.7666	-1.061
0.7833	-1.055
0.8000	-1.055
0.8166	-1.049
0.8333	-1.042
0.8500	-1.036
0.8666	-1.036
0.8833	-1.030
0.9000	-1.030
0.9166	-1.023
0.9333	-1.023
0.9500	-1.017
0.9666	-1.017
0.9833	-1.011
1.0000	-1.004
1.2000	-0.960
1.4000	-0.922
1.6000	-0.878
1.8000	-0.840
2.0000	-0.808
2.2000	-0.777
2.4000	-0.745
2.6000	-0.714
2.8000	-0.682
3.0000	-0.650
3.2000	-0.625
3.4000	-0.600
3.6000	-0.575
3.8000	-0.549
4.0000	-0.524

4.2000	-0.499
4.4000	-0.474
4.6000	-0.455
4.8000	-0.436
5.0000	-0.417
5.2000	-0.398
5.4000	-0.379
5.6000	-0.360
5.8000	-0.347
6.0000	-0.334
6.2000	-0.316
6.4000	-0.303
6.6000	-0.284
6.8000	-0.259
7.0000	-0.240
7.2000	-0.227
7.4000	-0.202
7.6000	-0.189
7.8000	-0.176
8.0000	-0.158
8.2000	-0.145
8.4000	-0.132
8.6000	-0.120
8.8000	-0.101
9.0000	-0.088
9.2000	-0.075
9.4000	-0.063
9.6000	-0.056
9.8000	-0.044
10.0000	-0.037

001160.0258

SE2000
Environmental Logger
05/25 19:25

Unit# 404 Test 9

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-041	MW-042
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 0 05/25 12:04:29

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	0.025
0.0083	0.012	0.555
0.0166	0.000	2.289
0.0250	0.929	1.296
0.0333	1.878	1.892
0.0416	1.973	2.056
0.0500	2.252	1.677
0.0583	2.056	1.170
0.0666	0.480	1.065
0.0750	1.214	1.135
0.0833	1.037	1.122
0.0916	0.727	1.056
0.1000	1.075	1.018
0.1083	0.746	1.009
0.1166	0.980	0.990
0.1250	0.778	0.965
0.1333	0.904	0.942
0.1416	0.790	0.920
0.1500	0.853	0.901
0.1583	0.790	0.883
0.1666	0.809	0.857
0.1750	0.778	0.845
0.1833	0.778	0.829
0.1916	0.759	0.807
0.2000	0.759	0.794
0.2083	0.740	0.778
0.2166	0.733	0.760
0.2250	0.727	0.747
0.2333	0.714	0.728
0.2416	0.702	0.715
0.2500	0.702	0.703
0.2583	0.689	0.687
0.2666	0.676	0.674
0.2750	0.670	0.659
0.2833	0.664	0.649
0.2916	0.657	0.633

001160.0259

0.3000	0.645	0.624
0.3083	0.645	0.608
0.3166	0.638	0.599
0.3250	0.626	0.586
0.3333	0.619	0.577
0.3500	0.613	0.555
0.3666	0.594	0.536
0.3833	0.588	0.517
0.4000	0.575	0.495
0.4166	0.562	0.479
0.4333	0.556	0.460
0.4500	0.550	0.444
0.4666	0.537	0.432
0.4833	0.531	0.416
0.5000	0.518	0.400
0.5166	0.512	0.387
0.5333	0.512	0.375
0.5500	0.499	0.362
0.5666	0.493	0.350
0.5833	0.487	0.337
0.6000	0.480	0.327
0.6166	0.474	0.315
0.6333	0.474	0.305
0.6500	0.468	0.299
0.6666	0.461	0.286
0.6833	0.461	0.274
0.7000	0.455	0.271
0.7166	0.449	0.258
0.7333	0.449	0.255
0.7500	0.442	0.245
0.7666	0.442	0.236
0.7833	0.436	0.230
0.8000	0.436	0.223
0.8166	0.436	0.217
0.8333	0.430	0.208
0.8500	0.430	0.204
0.8666	0.423	0.198
0.8833	0.423	0.195
0.9000	0.423	0.186
0.9166	0.417	0.182
0.9333	0.417	0.179
0.9500	0.417	0.173
0.9666	0.411	0.170
0.9833	0.411	0.163
1.0000	0.411	0.163
1.2000	0.392	0.119
1.4000	0.385	0.097
1.6000	0.373	0.081
1.8000	0.373	0.069
2.0000	0.366	0.063
2.2000	0.360	0.056
2.4000	0.360	0.050
2.6000	0.360	0.047
2.8000	0.354	0.044
3.0000	0.347	0.047
3.2000	0.347	0.047
3.4000	0.347	0.044
3.6000	0.347	0.044
3.8000	0.341	0.044
4.0000	0.347	0.044

001160.0260

4.2000	0.341	0.044
4.4000	0.341	0.044
4.6000	0.341	0.040
4.8000	0.341	0.044
5.0000	0.341	0.044
5.2000	0.341	0.044
5.4000	0.335	0.044
5.6000	0.341	0.044
5.8000	0.335	0.044
6.0000	0.335	0.044
6.2000	0.335	0.047
6.4000	0.335	0.047
6.6000	0.335	0.044
6.8000	0.335	0.040
7.0000	0.341	0.044
7.2000	0.341	0.047
7.4000	0.341	0.047
7.6000	0.335	0.044
7.8000	0.335	0.044
8.0000	0.335	0.044
8.2000	0.335	0.044
8.4000	0.335	0.044
8.6000	0.335	0.044
8.8000	0.335	0.044
9.0000	0.335	0.047
9.2000	0.335	0.047
9.4000	0.335	0.044
9.6000	0.335	0.044
9.8000	0.335	0.044
10.0000	0.335	0.044
12.0000	0.335	0.047
14.0000	0.328	0.044
16.0000	0.335	0.044
18.0000	0.328	0.047
20.0000	0.328	0.047
22.0000	0.328	0.047
24.0000	0.328	0.047
26.0000	0.322	0.047
28.0000	0.328	0.047
30.0000	0.335	0.044
32.0000	0.322	0.040
34.0000	0.322	0.047
36.0000	0.322	0.050
38.0000	0.328	0.050
40.0000	0.328	0.091

001160.0261

SE2000
Environmental Logger
05/25 19:29

Unit# 404 Test 9

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-041	MW-042
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 1 05/25 12:44:46

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.316	0.047
0.0083	0.170	-0.785
0.0166	0.676	-1.154
0.0250	-0.581	-1.053
0.0333	-0.101	-0.801
0.0416	-1.106	-1.255
0.0500	-0.796	-1.340
0.0583	-0.613	-1.434
0.0666	-1.416	-1.488
0.0750	-0.860	-1.456
0.0833	-0.999	-1.378
0.0916	-1.119	-1.330
0.1000	-0.917	-1.289
0.1083	-0.954	-1.233
0.1166	-0.986	-1.217
0.1250	-0.904	-1.207
0.1333	-0.910	-1.151
0.1416	-0.910	-1.116
0.1500	-0.872	-1.094
0.1583	-0.860	-1.062
0.1666	-0.853	-1.031
0.1750	-0.828	-1.012
0.1833	-0.822	-0.987
0.1916	-0.809	-0.964
0.2000	-0.790	-0.939
0.2083	-0.777	-0.917
0.2166	-0.765	-0.895
0.2250	-0.746	-0.873
0.2333	-0.739	-0.854
0.2416	-0.727	-0.832
0.2500	-0.708	-0.813
0.2583	-0.702	-0.794
0.2666	-0.683	-0.775
0.2750	-0.670	-0.756
0.2833	-0.664	-0.741
0.2916	-0.651	-0.722

001160.0262

0.3000	-0.638	-0.706
0.3083	-0.626	-0.690
0.3166	-0.613	-0.674
0.3250	-0.607	-0.659
0.3333	-0.594	-0.643
0.3500	-0.575	-0.614
0.3666	-0.556	-0.589
0.3833	-0.537	-0.561
0.4000	-0.524	-0.539
0.4166	-0.505	-0.514
0.4333	-0.486	-0.491
0.4500	-0.474	-0.469
0.4666	-0.461	-0.450
0.4833	-0.449	-0.428
0.5000	-0.436	-0.409
0.5166	-0.423	-0.391
0.5333	-0.417	-0.375
0.5500	-0.404	-0.362
0.5666	-0.398	-0.343
0.5833	-0.385	-0.331
0.6000	-0.379	-0.315
0.6166	-0.366	-0.302
0.6333	-0.360	-0.290
0.6500	-0.354	-0.280
0.6666	-0.347	-0.268
0.6833	-0.341	-0.255
0.7000	-0.335	-0.245
0.7166	-0.328	-0.236
0.7333	-0.322	-0.223
0.7500	-0.316	-0.214
0.7666	-0.309	-0.204
0.7833	-0.309	-0.198
0.8000	-0.303	-0.189
0.8166	-0.297	-0.179
0.8333	-0.290	-0.173
0.8500	-0.290	-0.167
0.8666	-0.284	-0.157
0.8833	-0.278	-0.151
0.9000	-0.278	-0.148
0.9166	-0.271	-0.138
0.9333	-0.271	-0.135
0.9500	-0.265	-0.126
0.9666	-0.259	-0.119
0.9833	-0.259	-0.116
1.0000	-0.259	-0.110
1.2000	-0.221	-0.059
1.4000	-0.196	-0.028
1.6000	-0.183	-0.006
1.8000	-0.164	0.009
2.0000	-0.151	0.018
2.2000	-0.145	0.022
2.4000	-0.132	0.025
2.6000	-0.126	0.028
2.8000	-0.120	0.034
3.0000	-0.113	0.037
3.2000	-0.107	0.037
3.4000	-0.101	0.037
3.6000	-0.101	0.037
3.8000	-0.094	0.044
4.0000	-0.094	0.044

001160.0263

4.2000	-0.088	0.044
4.4000	-0.082	0.044
4.6000	-0.082	0.044
4.8000	-0.075	0.040
5.0000	-0.075	0.044
5.2000	-0.075	0.044
5.4000	-0.069	0.044
5.6000	-0.069	0.044
5.8000	-0.069	0.044
6.0000	-0.063	0.044
6.2000	-0.063	0.047
6.4000	-0.063	0.047
6.6000	-0.056	0.044
6.8000	-0.056	0.047
7.0000	-0.056	0.044
7.2000	-0.056	0.047
7.4000	-0.056	0.047
7.6000	-0.050	0.047
7.8000	-0.050	0.047
8.0000	-0.044	0.047
8.2000	-0.044	0.047
8.4000	-0.044	0.044
8.6000	-0.044	0.047
8.8000	-0.037	0.047
9.0000	-0.044	0.047
9.2000	-0.037	0.047
9.4000	-0.037	0.047
9.6000	-0.037	0.044
9.8000	-0.037	0.047
10.0000	-0.031	0.044
12.0000	-0.025	0.050
14.0000	-0.018	0.050

001160.0264

SE2000
Environmental Logger
05/25 19:19

Unit# 404 Test 8

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~041~~ DP 043	MW-~~042~~ DP 044
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 0 05/25 10:11:57

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.000	0.227
0.0083	0.000	0.690
0.0166	0.012	0.863
0.0250	1.037	2.759
0.0333	1.682	2.639
0.0416	1.625	2.532
0.0500	1.815	2.579
0.0583	1.803	1.794
0.0666	0.063	1.727
0.0750	0.917	1.715
0.0833	0.645	1.715
0.0916	0.379	1.709
0.1000	0.683	1.702
0.1083	0.392	1.699
0.1166	0.556	1.696
0.1250	0.417	1.693
0.1333	0.474	1.690
0.1416	0.423	1.680
0.1500	0.430	1.680
0.1583	0.436	1.674
0.1666	0.417	1.668
0.1750	0.417	1.661
0.1833	0.398	1.658
0.1916	0.398	1.655
0.2000	0.385	1.649
0.2083	0.379	1.645
0.2166	0.373	1.642
0.2250	0.366	1.639
0.2333	0.360	1.636
0.2416	0.360	1.630
0.2500	0.354	1.630
0.2583	0.347	1.623
0.2666	0.347	1.623
0.2750	0.341	1.617
0.2833	0.335	1.614
0.2916	0.335	1.611

001160.0265

0.3000	0.335	1.608
0.3083	0.328	1.604
0.3166	0.328	1.604
0.3250	0.322	1.598
0.3333	0.322	1.598
0.3500	0.316	1.589
0.3666	0.316	1.586
0.3833	0.309	1.579
0.4000	0.309	1.576
0.4166	0.309	1.570
0.4333	0.303	1.563
0.4500	0.303	1.560
0.4666	0.303	1.554
0.4833	0.303	1.548
0.5000	0.303	1.541
0.5166	0.297	1.538
0.5333	0.297	1.529
0.5500	0.297	1.529
0.5666	0.297	1.519
0.5833	0.297	1.519
0.6000	0.297	1.513
0.6166	0.297	1.507
0.6333	0.290	1.504
0.6500	0.290	1.497
0.6666	0.290	1.494
0.6833	0.290	1.488
0.7000	0.290	1.488
0.7166	0.290	1.485
0.7333	0.290	1.475
0.7500	0.290	1.475
0.7666	0.290	1.475
0.7833	0.284	1.466
0.8000	0.284	1.466
0.8166	0.284	1.463
0.8333	0.284	1.459
0.8500	0.284	1.456
0.8666	0.284	1.450
0.8833	0.284	1.447
0.9000	0.284	1.444
0.9166	0.284	1.440
0.9333	0.284	1.440
0.9500	0.284	1.437
0.9666	0.278	1.434
0.9833	0.278	1.434
1.0000	0.278	1.428
1.2000	0.271	1.393
1.4000	0.265	1.368
1.6000	0.265	1.340
1.8000	0.259	1.318
2.0000	0.253	1.295
2.2000	0.246	1.270
2.4000	0.240	1.251
2.6000	0.240	1.226
2.8000	0.234	1.207
3.0000	0.234	1.185
3.2000	0.227	1.166
3.4000	0.221	1.150
3.6000	0.221	1.119
3.8000	0.215	1.113
4.0000	0.215	1.094

4.2000	0.208	1.081
4.4000	0.208	1.059
4.6000	0.208	1.046
4.8000	0.202	1.031
5.0000	0.202	1.018
5.2000	0.196	1.002
5.4000	0.196	0.986
5.6000	0.196	0.977
5.8000	0.189	0.964
6.0000	0.189	0.952
6.2000	0.189	0.942
6.4000	0.183	0.927
6.6000	0.183	0.917
6.8000	0.183	0.904
7.0000	0.177	0.892
7.2000	0.177	0.882
7.4000	0.177	0.873
7.6000	0.170	0.863
7.8000	0.170	0.851
8.0000	0.170	0.845
8.2000	0.170	0.835
8.4000	0.170	0.826
8.6000	0.170	0.816
8.8000	0.164	0.810
9.0000	0.164	0.800
9.2000	0.164	0.794
9.4000	0.158	0.785
9.6000	0.158	0.778
9.8000	0.158	0.772
10.0000	0.158	0.763
12.0000	0.139	0.703
14.0000	0.126	0.655
16.0000	0.120	0.621
18.0000	0.113	0.595
20.0000	0.101	0.573
22.0000	0.101	0.551
24.0000	0.094	0.539
26.0000	0.094	0.529
28.0000	0.088	0.517
30.0000	0.082	0.510
32.0000	0.082	0.504
34.0000	0.082	0.501
36.0000	0.075	0.495
38.0000	0.075	0.491
40.0000	0.069	0.491
42.0000	0.069	0.485
44.0000	0.069	0.488

001160.0267

SE2000
Environmental Logger
05/25 19:22

Unit# 404 Test 8

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	Surface	Surface
I.D.	MW-~~041~~ DP 043	MW-~~042~~ DP 044
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.107	0.006
Scale factor	20.010	9.989
Offset	-0.038	-0.012
Delay mSEC	50.000	50.000

Step 1 05/25 10:56:30

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.151	-1.491
0.0083	-0.341	-2.099
0.0166	-0.303	-1.784
0.0250	-0.082	-1.384
0.0333	-0.986	-1.333
0.0416	-0.758	-1.327
0.0500	-1.125	-1.314
0.0583	-1.226	-1.308
0.0666	-1.163	-1.302
0.0750	-1.043	-1.298
0.0833	-1.119	-1.292
0.0916	-1.037	-1.286
0.1000	-1.024	-1.286
0.1083	-1.018	-1.283
0.1166	-0.973	-1.276
0.1250	-0.967	-1.273
0.1333	-0.942	-1.273
0.1416	-0.923	-1.267
0.1500	-0.898	-1.264
0.1583	-0.879	-1.264
0.1666	-0.860	-1.258
0.1750	-0.841	-1.258
0.1833	-0.828	-1.258
0.1916	-0.809	-1.251
0.2000	-0.790	-1.251
0.2083	-0.777	-1.248
0.2166	-0.758	-1.245
0.2250	-0.739	-1.242
0.2333	-0.727	-1.242
0.2416	-0.714	-1.239
0.2500	-0.702	-1.235
0.2583	-0.689	-1.232
0.2666	-0.670	-1.232
0.2750	-0.657	-1.229
0.2833	-0.645	-1.226
0.2916	-0.632	-1.226

0.3000	-0.619	-1.226
0.3083	-0.607	-1.220
0.3166	-0.594	-1.220
0.3250	-0.588	-1.217
0.3333	-0.575	-1.217
0.3500	-0.550	-1.210
0.3666	-0.537	-1.207
0.3833	-0.512	-1.204
0.4000	-0.493	-1.198
0.4166	-0.480	-1.198
0.4333	-0.461	-1.194
0.4500	-0.449	-1.191
0.4666	-0.436	-1.185
0.4833	-0.423	-1.182
0.5000	-0.411	-1.179
0.5166	-0.398	-1.179
0.5333	-0.392	-1.176
0.5500	-0.379	-1.172
0.5666	-0.373	-1.169
0.5833	-0.366	-1.166
0.6000	-0.354	-1.163
0.6166	-0.347	-1.160
0.6333	-0.341	-1.157
0.6500	-0.335	-1.157
0.6666	-0.328	-1.153
0.6833	-0.328	-1.147
0.7000	-0.322	-1.147
0.7166	-0.316	-1.144
0.7333	-0.316	-1.144
0.7500	-0.309	-1.138
0.7666	-0.303	-1.138
0.7833	-0.303	-1.131
0.8000	-0.303	-1.131
0.8166	-0.290	-1.131
0.8333	-0.290	-1.131
0.8500	-0.297	-1.119
0.8666	-0.297	-1.122
0.8833	-0.290	-1.122
0.9000	-0.284	-1.125
0.9166	-0.284	-1.112
0.9333	-0.278	-1.112
0.9500	-0.278	-1.106
0.9666	-0.278	-1.106
0.9833	-0.271	-1.103
1.0000	-0.278	-1.103
1.2000	-0.259	-1.075
1.4000	-0.252	-1.049
1.6000	-0.246	-1.021
1.8000	-0.240	-0.996
2.0000	-0.234	-0.971
2.2000	-0.227	-0.945
2.4000	-0.221	-0.920
2.6000	-0.221	-0.898
2.8000	-0.221	-0.876
3.0000	-0.215	-0.854
3.2000	-0.215	-0.832
3.4000	-0.208	-0.807
3.6000	-0.208	-0.788
3.8000	-0.208	-0.763
4.0000	-0.208	-0.744

001160.0269

4.2000	-0.202	-0.725
4.4000	-0.202	-0.706
4.6000	-0.202	-0.684
4.8000	-0.196	-0.665
5.0000	-0.196	-0.646
5.2000	-0.196	-0.627
5.4000	-0.196	-0.608
5.6000	-0.189	-0.589
5.8000	-0.189	-0.570
6.0000	-0.189	-0.554
6.2000	-0.189	-0.536
6.4000	-0.189	-0.520
6.6000	-0.183	-0.504
6.8000	-0.183	-0.485
7.0000	-0.183	-0.469
7.2000	-0.183	-0.457
7.4000	-0.183	-0.438
7.6000	-0.177	-0.425
7.8000	-0.177	-0.413
8.0000	-0.177	-0.400
8.2000	-0.177	-0.387
8.4000	-0.177	-0.378
8.6000	-0.177	-0.365
8.8000	-0.177	-0.346
9.0000	-0.170	-0.343
9.2000	-0.170	-0.331
9.4000	-0.170	-0.318
9.6000	-0.164	-0.305
9.8000	-0.170	-0.293
10.0000	-0.164	-0.277
12.0000	-0.158	-0.160
14.0000	-0.151	-0.059
16.0000	-0.145	0.022
18.0000	-0.139	0.091
20.0000	-0.139	0.148
22.0000	-0.132	0.198
24.0000	-0.132	0.239
26.0000	-0.126	0.271
28.0000	-0.126	0.305
30.0000	-0.120	0.327
32.0000	-0.113	0.349

001160.0270

SE2000
Environmental Logger
05/25 19:37

Unit# 404 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-~~040~~ DP D46
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 0 05/25 14:38:21

Elapsed Time	INPUT 1
0.0000	-0.006
0.0083	-0.006
0.0166	-0.006
0.0250	-0.006
0.0333	-0.006
0.0416	2.155
0.0500	1.042
0.0583	0.082
0.0666	0.120
0.0750	0.132
0.0833	0.132
0.0916	0.132
0.1000	0.132
0.1083	0.132
0.1166	0.132
0.1250	0.132
0.1333	0.132
0.1416	0.132
0.1500	0.132
0.1583	0.132
0.1666	0.132
0.1750	0.132
0.1833	0.132
0.1916	0.132
0.2000	0.126
0.2083	0.126
0.2166	0.126
0.2250	0.126
0.2333	0.126
0.2416	0.126
0.2500	0.120
0.2583	0.120
0.2666	0.120
0.2750	0.120
0.2833	0.113
0.2916	0.113

0.3000	0.113
0.3083	0.107
0.3166	0.107
0.3250	0.101
0.3333	0.101
0.3500	0.088
0.3666	0.088
0.3833	0.075
0.4000	0.075
0.4166	0.069
0.4333	0.069
0.4500	0.063
0.4666	0.063
0.4833	0.056
0.5000	0.056
0.5166	0.056
0.5333	0.050
0.5500	0.050
0.5666	0.050
0.5833	0.044
0.6000	0.044
0.6166	0.044
0.6333	0.044
0.6500	0.037
0.6666	0.044
0.6833	0.037
0.7000	0.037
0.7166	0.037
0.7333	0.037
0.7500	0.037
0.7666	0.037
0.7833	0.037
0.8000	0.037
0.8166	0.037
0.8333	0.037
0.8500	0.031
0.8666	0.031
0.8833	0.031
0.9000	0.031
0.9166	0.031
0.9333	0.031
0.9500	0.031
0.9666	0.031
0.9833	0.031
1.0000	0.025
1.2000	0.025
1.4000	0.018
1.6000	0.018
1.8000	0.012
2.0000	0.012
2.2000	0.006
2.4000	0.000
2.6000	0.000
2.8000	-0.006
3.0000	-0.006
3.2000	-0.006
3.4000	-0.006
3.6000	-0.006
3.8000	-0.012
4.0000	-0.006

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4.2000	-0.006
4.4000	-0.012
4.6000	-0.012
4.8000	-0.012
5.0000	-0.012
5.2000	-0.012
5.4000	-0.018
5.6000	-0.012
5.8000	-0.012
6.0000	-0.018
6.2000	-0.018
6.4000	-0.012
6.6000	-0.018
6.8000	-0.012
7.0000	-0.018
7.2000	-0.018
7.4000	-0.018
7.6000	-0.018
7.8000	-0.018
8.0000	-0.018
8.2000	-0.018
8.4000	-0.018
8.6000	-0.018
8.8000	-0.018
9.0000	-0.018
9.2000	-0.018
9.4000	-0.018
9.6000	-0.012
9.8000	-0.012
10.0000	-0.012

001160.0273

SE2000
Environmental Logger
05/25 19:54

Unit# 404 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	Surface
I.D.	MW-~~040~~ DP 046
Reference	0.000
SG	1.000
Linearity	0.107
Scale factor	20.010
Offset	-0.038
Delay mSEC	50.000

Step 1 05/25 14:49:45

Elapsed Time	INPUT 1
0.0000	-0.101
0.0083	-0.031
0.0166	-0.366
0.0250	-0.379
0.0333	-0.372
0.0416	-0.372
0.0500	-0.372
0.0583	-0.372
0.0666	-0.372
0.0750	-0.366
0.0833	-0.360
0.0916	-0.360
0.1000	-0.360
0.1083	-0.353
0.1166	-0.347
0.1250	-0.347
0.1333	-0.341
0.1416	-0.334
0.1500	-0.328
0.1583	-0.322
0.1666	-0.315
0.1750	-0.309
0.1833	-0.296
0.1916	-0.290
0.2000	-0.284
0.2083	-0.278
0.2166	-0.271
0.2250	-0.265
0.2333	-0.252
0.2416	-0.246
0.2500	-0.240
0.2583	-0.233
0.2666	-0.227
0.2750	-0.221
0.2833	-0.214
0.2916	-0.208

0.3000	-0.202
0.3083	-0.195
0.3166	-0.189
0.3250	-0.183
0.3333	-0.176
0.3500	-0.164
0.3666	-0.157
0.3833	-0.151
0.4000	-0.139
0.4166	-0.132
0.4333	-0.126
0.4500	-0.120
0.4666	-0.113
0.4833	-0.107
0.5000	-0.101
0.5166	-0.101
0.5333	-0.094
0.5500	-0.088
0.5666	-0.088
0.5833	-0.082
0.6000	-0.082
0.6166	-0.075
0.6333	-0.075
0.6500	-0.075
0.6666	-0.069
0.6833	-0.069
0.7000	-0.069
0.7166	-0.063
0.7333	-0.063
0.7500	-0.063
0.7666	-0.063
0.7833	-0.063
0.8000	-0.056
0.8166	-0.056
0.8333	-0.056
0.8500	-0.056
0.8666	-0.056
0.8833	-0.056
0.9000	-0.056
0.9166	-0.050
0.9333	-0.050
0.9500	-0.050
0.9666	-0.050
0.9833	-0.050
1.0000	-0.050
1.2000	-0.044
1.4000	-0.044
1.6000	-0.037
1.8000	-0.044
2.0000	-0.037
2.2000	-0.037
2.4000	-0.037
2.6000	-0.037
2.8000	-0.037
3.0000	-0.037
3.2000	-0.037
3.4000	-0.044
3.6000	-0.044
3.8000	-0.044
4.0000	-0.044

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4.2000	-0.044
4.4000	-0.044
4.6000	-0.044
4.8000	-0.044
5.0000	-0.044
5.2000	-0.044
5.4000	-0.044
5.6000	-0.044
5.8000	-0.044
6.0000	-0.037
6.2000	-0.037
6.4000	-0.037
6.6000	-0.037
6.8000	-0.037
7.0000	-0.037
7.2000	-0.044
7.4000	-0.044
7.6000	-0.044
7.8000	-0.044
8.0000	-0.044
8.2000	-0.044
8.4000	-0.044
8.6000	-0.044
8.8000	-0.044
9.0000	-0.044
9.2000	-0.037
9.4000	-0.037
9.6000	-0.037
9.8000	-0.044
10.0000	-0.044
12.0000	-0.037

001160.0276

APPENDIX P

METEOROLOGICAL RECORDS

001160.0277

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/05	1300	3.848	222.9	15.54	16.13		1018	0
04/05	1315	3.913	233.9	17.48	15.87		1018	0
04/05	1330	3.303	240.8	16.13	15.76		1018	0
04/05	1345	2.622	253.7	48.09	16.03		1018	0.02
04/05	1400	3.884	334.1	20.15	15.81		1018	0
04/05	1415	3.688	333.1	15.93	15.97		1018	0
04/05	1430	3.16	347	15.99	15.85		1018	0
04/05	1445	2.666	351.2	14.94	15.36		1018	0
04/05	1500	2.4	13	21.36	14.77		1017	0
04/05	1515	2.033	61.75	23.95	14.6		1016	0
04/05	1530	2.8	88.7	16.34	14.49		1016	0
04/05	1545	2.914	90.4	16.97	14.53		1016	0
04/05	1600	3.934	106.1	16.66	14.37		1014	0.01
04/05	1615	3.553	102.8	20.97	14.7		1014	0
04/05	1630	2.787	91.9	18.66	15.01		1016	0
04/05	1645	2.421	321.6	24.85	15.22		1016	0
04/05	1700	1.468	319.2	22.37	15.32		1016	0
04/05	1715	1.222	339.6	26.05	15.47		1016	0
04/05	1730	1.158	331.2	16.79	15.5		1016	0.01
04/05	1745	1.875	316	15.96	15.69		1017	0.15
04/05	1800	2.748	324.1	14.82	15.76		1016	0
04/05	1815	3.901	315.6	18.15	15.65		1017	0
04/05	1830	4.51	319.9	13.14	14.63		1017	0
04/05	1845	4.879	326.3	13.33	13.94		1017	0
04/05	1900	3.885	320.4	18.1	13.68		1017	0
04/05	1915	4.069	316.7	12.8	13.46		1017	0

001160.0278

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/05	1930	4.084	330	15.57	13.27		1018	0
04/05	1945	4.262	323	17.49	13.04		1018	0
04/05	2000	3.943	328.3	11.24	12.81		1018	0
04/05	2015	4.383	322.7	15.09	12.65		1019	0
04/05	2030	4.271	329.6	18.25	12.46		1019	0
04/05	2045	4.566	330.1	14.47	12.25		1019	0
04/05	2100	4.361	330.7	17.14	12.03		1020	0
04/05	2115	4.422	341.3	16.79	11.77		1020	0
04/05	2130	4.372	331.1	14.64	11.54		1020	0
04/05	2145	4.343	329.6	15.7	11.27		1021	0
04/05	2200	4.499	336.2	16.24	11.21		1021	0
04/05	2215	4.052	330.8	18.04	11.14		1021	0
04/05	2230	4.984	343.5	16.25	10.77		1021	0
04/05	2245	4.577	337.6	15.13	10.48		1022	0
04/05	2300	4.239	350.1	22.57	10.48		1022	0
04/05	2315	3.936	2.924	16.27	10.3		1022	0
04/05	2330	3.972	2.893	17.16	10.18		1022	0
04/05	2345	4.708	359.5	11.9	10.03		1022	0
04/06	0	4.267	342.4	16.16	10.02		1022	0
04/06	15	3.646	2.343	14.53	10.04		1023	0
04/06	30	3.644	346.3	14.93	10.04		1023	0
04/06	45	4.174	344.1	19.37	10.08		1023	0
04/06	100	3.48	347.4	14.74	10.11		1023	0
04/06	115	4.06	340.1	15.06	10.15		1023	0
04/06	130	3.889	3	15.44	10.21		1023	0
04/06	145	3.309	16.97	18.2	10.16		1023	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/06	200	3.679	10.61	17.28	10.09		1023	0
04/06	215	3.801	11.52	21.33	9.9		1023	0
04/06	230	3.612	17.88	15.73	9.82		1023	0
04/06	245	3.881	17.77	17.37	9.8		1023	0
04/06	300	3.283	1.338	15.65	9.76		1023	0
04/06	315	3.92	7.47	14.51	9.7		1023	0
04/06	330	4.206	12.5	18.01	9.49		1023	0
04/06	345	3.775	0.543	21.47	9.43		1023	0
04/06	400	4.57	1.218	15.05	9.4		1023	0
04/06	415	3.539	4.19	21.01	9.43		1023	0
04/06	430	3.563	3.1	16.04	9.48		1023	0
04/06	445	3.2	9.23	19.35	9.49		1023	0
04/06	500	3.008	15.04	16.76	9.53		1023	0
04/06	515	2.947	9.63	14.48	9.5		1023	0
04/06	530	2.842	22.69	18.22	9.5		1023	0
04/06	545	2.675	28.41	16.88	9.56		1023	0
04/06	600	2.602	39	20.34	9.52		1023	0
04/06	615	2.728	36.34	17.92	9.07		1023	0
04/06	630	3.169	44.47	14.16	8.88		1023	0
04/06	645	2.794	19.03	18.73	8.78		1024	0
04/06	700	2.662	16.92	17.18	8.76		1024	0
04/06	715	2.682	22.86	22.41	8.81		1024	0
04/06	730	2.914	59.05	16.19	8.57		1024	0
04/06	745	2.688	68.94	15.71	8.49		1025	0
04/06	800	2.777	64.65	14.7	8.63		1025	0
04/06	815	3.228	62.53	14.43	8.68		1025	0

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Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/06	830	2.208	53.12	15.36	8.9		1025	0
04/06	845	2.823	64.95	16.08	8.81		1025	0
04/06	900	2.791	55.61	19.1	9.02		1025	0
04/06	915	3.443	73.2	14.27	9.38		1026	0
04/06	930	3.444	75.8	16.26	9.13		1026	0
04/06	1000	2.636	37.31	15.53	8.85		1026	0
04/06	1015	1.802	43.48	26.76	9.49		1026	0
04/06	1030	2.202	39.15	28.15	10.07		1026	0
04/06	1045	0.916	359.6	42.98	10.22		1026	0
04/06	1100	2.255	17.05	27.04	11.13		1026	0
04/06	1115	2.729	353.9	21.75	11.45		1026	0
04/06	1130	2.964	359.4	21.88	12.6		1026	0
04/06	1145	2.62	26.48	22.14	10.99		1026	0
04/06	1200	3.054	0.017	30.33	11.29		1026	0
04/06	1215	3.008	356.9	23.75	11.59		1026	0
04/06	1230	2.737	354.3	25	11.89		1026	0
04/06	1245	3.158	359.4	30.54	12.37		1026	0
04/06	1300	2.784	353.3	21.7	12.67		1025	0
04/06	1315	2.901	350.1	28.45	12.8		1025	0
04/06	1330	2.993	345.7	22.45	13.13		1025	0
04/06	1345	2.698	358	26.01	13.42		1025	0
04/06	1400	2.861	346.2	22.35	13.56		1024	0
04/06	1415	2.499	333.2	21.26	13.82		1024	0
04/06	1430	2.423	329.1	22.46	14.27		1024	0
04/06	1445	2.19	308.6	33.45	14.79		1024	0
04/06	1500	2.551	331.5	22.7	14.89		1024	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/06	1515	2.511	326.4	16.92	14.79		1024	0
04/06	1530	2.034	325.8	24.57	15.15		1024	0
04/06	1545	2.33	326.4	16.54	15.37		1023	0
04/06	1600	2.161	311.7	20.37	15.95		1023	0
04/06	1615	1.73	316.1	30.95	16.69		1023	0
04/06	1630	2.117	331.3	29.54	16.23		1023	0
04/06	1645	1.987	312.7	27.24	16.73		1023	0
04/06	1700	1.192	324.2	29.28	16.88		1023	0
04/06	1715	1.252	339.8	31.31	17.39		1023	0
04/06	1730	1.283	331	37.99	17.79		1022	0
04/06	1745	1.194	314.4	23.77	17.76		1023	0
04/06	1800	1.461	345.6	28.25	17.59		1022	0
04/06	1815	0.918	347.4	29.17	17.53		1023	0
04/06	1830	1.168	300.4	22.07	17.78		1023	0
04/06	1845	1.504	297.4	20.11	17.38		1023	0
04/06	1900	1.084	311.4	18.99	16.54		1023	0
04/06	1915	0.531	287.2	33.96	15.27		1023	0
04/06	1930	0.571	301.2	18.51	14.25		1023	0
04/06	1945	0.267	285.1	0.771	13.31		1023	0
04/06	2000	0.004	284.4	0	12.52		1023	0
04/06	2015	0	286.3	0.679	12.11		1023	0
04/06	2030	0	286.7	0	11.56		1023	0
04/06	2045	0	286.6	0	11.69		1023	0
04/06	2100	0	286.7	0	11.47		1023	0
04/06	2115	0.038	267.5	27.04	11.28		1024	0
04/06	2130	0	161.2	0	11.22		1024	0

001160.0282

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/06	2145	0.093	160.6	0	11.03		1024	0
04/06	2200	0.002	160.7	0	10.73		1024	0
04/06	2215	0	160.8	0	10.34		1024	0
04/06	2230	0	160.7	0	10.36		1024	0
04/06	2245	0	160.8	0	10.22		1024	0
04/06	2300	0.349	155.9	8.23	10.2		1023	0
04/06	2315	0.481	137.8	9.82	10.6		1023	0
04/06	2330	0.19	143.2	4.485	10.07		1023	0
04/06	2345	0.059	141.1	0	9.7		1023	0
04/07	0	0.208	149.2	37.8	9.62		1023	0
04/07	15	0.061	272.3	0	9.35		1023	0
04/07	30	0	272.3	0	9.28		1023	0
04/07	45	0	272.3	0	9.17		1023	0
04/07	100	0.026	272.1	0	9.14		1023	0
04/07	115	0.518	176.4	5.463	9.23		1023	0
04/07	130	0.035	178.1	0	9.1		1023	0
04/07	145	0	178.2	0	8.78		1022	0
04/07	200	0	178.2	0	8.69		1022	0
04/07	215	0.314	264.1	64.69	8.54		1022	0
04/07	230	0.023	329	0	8.62		1022	0
04/07	245	0	329	0	8.33		1022	0
04/07	300	0	329	0	8.22		1022	0
04/07	315	0.543	53.94	13.14	8.46		1022	0
04/07	330	0.388	49.38	7.54	9.07		1022	0
04/07	345	0.003	57.22	8.66	8.76		1022	0
04/07	400	0.068	47.32	15.05	8.25		1022	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/07	415	0.631	23.89	14.42	8.28		1022	0
04/07	430	1.015	42.22	14.02	9.5		1022	0
04/07	445	0.86	45.91	18.9	9.94		1022	0
04/07	500	0.606	42.99	15.49	9.88		1022	0
04/07	515	0.605	65.32	12.65	9.65		1022	0
04/07	530	0.793	52.56	16.33	9.66		1022	0
04/07	545	0.667	54.23	8.09	9.78		1022	0
04/07	600	0.117	33.01	9.93	9.06		1023	0
04/07	615	0.14	348.7	7.29	8.54		1023	0
04/07	630	0.004	349.7	3.502	8.37		1023	0
04/07	645	0.436	65.32	9.34	8.28		1023	0
04/07	700	0.381	45.66	12.38	8.48		1023	0
04/07	715	0.758	57.11	22.84	9.68		1023	0
04/07	730	1.038	67.73	12.23	10.86		1023	0
04/07	745	1.262	49.76	11.68	11.84		1023	0
04/07	800	1.196	57.98	14.56	12.77		1023	0
04/07	815	1.536	67.43	13.24	13.54		1023	0
04/07	830	1.004	41.76	15.8	14.32		1023	0
04/07	845	1.05	60.13	14.94	14.93		1023	0
04/07	900	0.765	50.24	26.69	15.87		1023	0
04/07	915	0.478	51.97	41.27	16.49		1023	0
04/07	930	0.815	76.8	21.54	17.6		1023	0
04/07	945	3.098	97.2	15.2	18.19		1023	0
04/07	1000	3.106	93.7	17.34	18.75		1023	0
04/07	1015	2.898	102	20.85	19.15		1023	0
04/07	1030	3.364	112.4	19.06	20.16		1023	0

001160.0284

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/07	1045	3.991	116.6	16.74	20.06		1023	0
04/07	1100	4.035	109.8	15.98	20.45		1023	0
04/07	1115	4.067	118.2	19.15	20.77		1023	0
04/07	1130	3.874	110.9	18.28	21.34		1023	0
04/07	1145	3.521	114.4	17.89	21.51		1023	0
04/07	1200	3.071	119.8	19.2	21.77		1023	0
04/07	1215	2.647	131.9	30.29	21.91		1023	0
04/07	1230	2.276	147.1	34.26	22.28		1023	0
04/07	1245	2.493	125.1	28.07	22.73		1023	0
04/07	1300	2.526	133.7	31.85	22.5		1023	0
04/07	1315	2.916	129.7	21.91	22.46		1023	0
04/07	1330	2.395	128.8	29.6	22.6		1022	0
04/07	1345	2.333	130.7	34.28	22.91		1022	0
04/07	1400	2.596	124	27.57	23.03		1022	0
04/07	1415	2.851	128.9	37.86	22.95		1022	0
04/07	1430	2.804	122.5	18.85	22.95		1022	0
04/07	1445	2.473	133.9	31.08	22.96		1022	0
04/07	1500	2.615	128.3	26.52	23.18		1021	0
04/07	1515	2.637	133.5	29.24	23.17		1021	0
04/07	1530	2.699	129.7	24.14	22.89		1021	0
04/07	1545	2.773	133.9	28.38	23.18		1021	0
04/07	1600	2.542	144.6	29.48	22.98		1021	0
04/07	1615	2.612	128.6	34.92	23		1021	0
04/07	1630	2.134	142.7	28.98	23.12		1021	0
04/07	1645	2.59	127	25.6	22.83		1021	0
04/07	1700	2.292	121.1	21.77	22.77		1021	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/07	1715	2.53	117.5	20.43	22.58		1021	0
04/07	1730	2.21	133.3	27.72	22.54		1021	0
04/07	1745	2.333	116.5	20.89	22.45		1021	0
04/07	1800	3.185	115.3	20.84	22.17		1021	0
04/07	1815	3.521	108	14.7	21.73		1021	0
04/07	1830	3.011	106.2	21.6	21.5		1021	0
04/07	1845	2.806	111.9	21.35	21.15		1021	0
04/07	1900	2.546	119.9	19.37	20.8		1021	0
04/07	1915	3.173	119	16.04	20.39		1021	0
04/07	1930	2.53	119.6	14.77	20.08		1021	0
04/07	1945	3.033	115.9	16.31	19.82		1021	0
04/07	2000	2.948	116.8	16.98	19.56		1021	0
04/07	2015	2.149	112	15.71	19.2		1021	0
04/07	2030	2.514	106.7	12.56	18.88		1021	0
04/07	2045	2.801	109.6	14.38	18.71		1021	0
04/07	2100	2.982	111.3	13.86	18.46		1021	0
04/07	2115	2.797	112.9	19.37	18.18		1021	0
04/07	2130	2.604	109	17.66	18.05		1021	0
04/07	2145	2.077	111.6	15.69	17.86		1021	0
04/07	2200	1.599	106	17.88	17.71		1022	0
04/07	2215	1.063	118.3	22.61	17.49		1022	0
04/07	2230	1.126	118.9	17.55	17.34		1022	0
04/07	2245	1.08	124.4	15.43	17.32		1021	0
04/07	2300	0.838	130.6	15.6	17.06		1022	0
04/07	2315	1.101	126.9	15.36	17.04		1021	0
04/07	2330	1.403	124.4	16.39	17.36		1021	0

001160.0286

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/07	2345	1.662	117.5	14.5	17.54		1021	0
04/08	0	1.564	120.1	16	17.47		1021	0
04/08	15	1.851	118.1	14.84	17.61		1021	0
04/08	30	1.323	120.6	19.26	17.5		1021	0
04/08	45	1.376	119	19.38	17.37		1021	0
04/08	100	1.473	110.5	16.53	17.34		1020	0
04/08	115	1.049	98.8	14.37	17.08		1020	0
04/08	130	0.891	98.9	17.4	16.73		1020	0
04/08	145	0.742	109.8	20.21	16.54		1021	0
04/08	200	0.761	98.1	14.8	16.45		1020	0
04/08	215	0.709	91.6	14.55	16.52		1020	0
04/08	230	0.357	90.1	13.31	16.44		1020	0
04/08	245	0.598	97.1	11.91	16.18		1020	0
04/08	300	0.784	96.5	13.73	16.42		1020	0
04/08	315	0.827	93.1	13.05	16.43		1020	0
04/08	330	0.91	85.9	9.38	16.29		1020	0
04/08	345	0.762	84.8	7.37	16.17		1020	0
04/08	400	0.919	81.3	10.87	15.83		1020	0
04/08	415	1.064	98.6	17.28	16.18		1019	0
04/08	430	0.707	118.7	13.87	15.91		1020	0
04/08	445	1.059	108.4	15.69	16.1		1019	0
04/08	500	1.008	107.9	9.95	16.18		1020	0
04/08	515	1.482	96.2	10.14	16.36		1019	0
04/08	530	1.171	96.5	17.11	16.44		1020	0
04/08	545	0.595	100	11.39	16.27		1020	0
04/08	600	0.91	97.5	10.1	16.07		1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/08	615	1.238	93.9	12.57	16.54		1020	0
04/08	630	1.565	80.2	10.22	16.84		1020	0
04/08	645	1.498	96	13.07	16.84		1020	0
04/08	700	2.004	99.9	13.41	17.16		1020	0
04/08	715	1.941	105.6	13.61	17.2		1020	0
04/08	730	2.034	98.9	13.26	17.48		1020	0
04/08	745	2.085	98.2	12.67	18.01		1020	0
04/08	800	1.938	98.7	12.12	18.63		1020	0
04/08	815	1.882	104.4	16.51	19.26		1020	0
04/08	830	2.912	111.1	13.56	19.76		1020	0
04/08	845	2.567	110.7	17.01	20.38		1020	0
04/08	900	3.133	115.7	18.75	20.98		1020	0
04/08	915	3.8	118	14.07	21.31		1020	0
04/08	930	3.853	114.3	15.33	21.85		1020	0
04/08	945	3.726	114.9	16.56	22.43		1020	0
04/08	1000	3.287	117.9	19.92	22.96		1020	0
04/08	1015	3.15	116.3	23	23.51		1021	0
04/08	1030	3.08	126.7	22.35	23.23		1021	0
04/08	1045	2.783	123.7	24.67	23.64		1021	0
04/08	1100	3.661	125.5	20.97	24.01		1021	0
04/08	1115	2.763	110.4	21.24	24.67		1021	0
04/08	1130	3.776	111.6	14.41	24.89		1020	0
04/08	1145	4.58	107.6	14.91	25.1		1020	0
04/08	1200	4.233	102.6	17.06	25.41		1020	0
04/08	1215	4.004	118.5	18.71	25.38		1020	0
04/08	1230	3.885	116.7	20.68	25.09		1020	0

001160.0288

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/08	1245	3.401	112.7	18.65	25.44		1020	0
04/08	1300	3.125	125.1	25.33	25.83		1020	0
04/08	1315	2.934	130.5	28.7	25.86		1020	0
04/08	1330	3.304	120.7	25.66	25.31		1020	0
04/08	1345	3.235	120.3	21.3	25.66		1020	0
04/08	1400	2.689	122	20.88	25.75		1020	0
04/08	1415	3.005	126.6	26.02	25.48		1019	0
04/08	1430	2.164	145.2	29.66	25.74		1019	0
04/08	1445	2.554	130.7	31.94	26.26		1019	0
04/08	1500	2.735	127.9	29.11	26.49		1019	0
04/08	1515	2.937	127.9	30.34	25.87		1019	0
04/08	1530	3.621	113.4	14.65	25.83		1018	0
04/08	1545	3.083	117.5	19.96	25.85		1018	0
04/08	1600	2.855	126.2	24.96	25.66		1018	0
04/08	1615	3.305	120.4	21.35	25.6		1018	0
04/08	1630	3.19	116.6	17.32	25.83		1018	0
04/08	1645	3.513	122.7	19.44	25.5		1018	0
04/08	1700	3.046	118.8	21.18	25.37		1018	0
04/08	1715	3.019	119.8	18.46	24.91		1018	0
04/08	1730	3.147	114.5	15.84	25.35		1018	0
04/08	1745	2.655	121.1	23.21	24.91		1018	0
04/08	1800	2.8	127.4	18.8	24.82		1018	0
04/08	1815	2.168	125.8	22.82	24.72		1018	0
04/08	1830	2.867	116.1	18.14	24.34		1018	0
04/08	1845	2.716	116.5	17.94	24.1		1018	0
04/08	1900	2.5	108.8	22.24	23.96		1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/08	1915	2.941	119.6	13.91	23.64		1018	0
04/08	1930	2.864	112.6	16.29	23.42		1018	0
04/08	1945	2.59	119.9	18.38	23.33		1018	0
04/08	2000	2.344	117.9	14.01	23.21		1018	0
04/08	2015	3.17	102.5	14.17	22.69		1018	0
04/08	2030	3.415	101.7	12.31	22.31		1018	0
04/08	2045	3.112	106.1	14.12	22.2		1018	0
04/08	2100	2.889	100.5	14.65	22.08		1018	0
04/08	2115	2.365	104.8	15.02	22.01		1018	0
04/08	2130	2.727	106.2	15.94	22.11		1018	0
04/08	2145	2.964	114.6	15	22.25		1018	0
04/08	2200	2.893	113	12.86	22.28		1018	0
04/08	2215	2.636	114.3	16.74	22.31		1018	0
04/08	2230	2.737	116.7	14.75	22.27		1018	0
04/08	2245	2.456	119.4	12.56	22.27		1018	0
04/08	2300	3.18	119.5	19.66	22.34		1018	0
04/08	2315	2.983	121.3	15.83	22.33		1018	0
04/08	2330	3.031	125.6	17.97	22.31		1018	0
04/08	2345	2.73	125.1	18.16	22.22		1018	0
04/09	0	1.925	129.4	22.42	22.22		1017	0
04/09	15	2.709	127.8	21.92	22.21		1017	0
04/09	30	2.889	133.5	25.55	22.18		1017	0
04/09	45	2.941	126.9	21.6	22.16		1017	0
04/09	100	2.603	128.6	20.53	22.24		1017	0
04/09	115	2.46	126.5	19.73	22.28		1016	0
04/09	130	2.555	131.1	23.89	22.41		1016	0

001160.0290

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/09	145	2.235	133.3	31.45	22.28		1016	0
04/09	200	2.092	129.9	24.75	22.2		1016	0
04/09	215	2.237	130.3	24.72	22.18		1016	0
04/09	230	2.314	128.3	29.35	22.2		1016	0
04/09	245	2.29	130.1	25.37	22.22		1016	0
04/09	300	2.208	129.6	27.75	22.23		1016	0
04/09	315	1.966	135.9	28.62	22.25		1016	0
04/09	330	1.944	129.6	27.65	22.25		1016	0
04/09	345	1.828	135.7	25.41	22.27		1016	0
04/09	400	1.681	136.2	29.7	22.28		1016	0
04/09	415	2.013	131.9	20.72	22.37		1016	0
04/09	430	1.98	127.9	23.64	22.48		1016	0
04/09	445	1.758	136.9	27.9	22.6		1016	0
04/09	500	1.967	127.4	26.48	22.68		1016	0
04/09	515	1.748	132.4	27.92	22.72		1016	0
04/09	530	2.125	130.1	24.46	22.74		1016	0
04/09	545	1.719	133.8	25.04	22.73		1016	0
04/09	600	2.457	137.4	24.05	22.72		1016	0
04/09	615	1.92	129.7	28.69	22.64		1016	0
04/09	630	2.201	132.4	25.25	22.58		1016	0
04/09	645	1.912	130.5	27.56	22.57		1016	0
04/09	700	2.257	137	28.68	22.64		1016	0
04/09	715	2.03	134.4	27.33	22.72		1017	0
04/09	730	2.211	131.1	19.68	22.83		1017	0
04/09	745	2.351	131.9	26.27	23.06		1017	0
04/09	800	1.953	134.3	23.34	23.25		1017	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/09	815	2.317	136.5	24.38	23.39		1017	0
04/09	830	2.252	134.2	24.93	23.58		1018	0
04/09	845	1.976	125.5	22.92	23.73		1018	0
04/09	900	2.005	129.3	23.61	23.87		1018	0
04/09	915	2.354	113.8	17.94	24.12		1018	0
04/09	930	2.652	117.8	17.54	24.23		1018	0
04/09	945	3.086	114.2	16.4	24.44		1018	0
04/09	1000	2.702	118.1	17.52	24.8		1019	0
04/09	1015	2.663	123.3	18.42	25.38		1019	0
04/09	1030	2.659	128.3	19.58	25.71		1019	0
04/09	1045	2.725	117	19.45	25.97		1019	0
04/09	1100	2.877	126.1	22.73	26.53		1019	0
04/09	1115	2.679	137.8	30.59	27.07		1019	0
04/09	1130	2.223	156.3	33.54	27.17		1019	0
04/09	1145	2.644	133.7	35.06	27.73		1019	0
04/09	1200	2.46	137	36.5	27.64		1019	0
04/09	1215	2.254	163.8	35.49	28.36		1019	0
04/09	1230	2.697	137	40.22	28.73		1019	0
04/09	1245	2.74	160.9	36.7	28.65		1019	0
04/09	1300	2.462	141.2	35.7	28.22		1019	0
04/09	1315	2.745	139.7	30.31	27.61		1019	0
04/09	1330	1.935	164	49.62	28.13		1019	0
04/09	1345	2.589	159.5	39.58	29.05		1019	0
04/09	1400	2.323	150	37.82	28.95		1019	0
04/09	1415	2.312	159.1	44.05	28.66		1018	0
04/09	1430	2.397	158.6	39.89	28.86		1018	0

001160.0292

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/09	1445	2.569	174.8	40.93	29		1018	0
04/09	1500	2.82	171.7	40.04	29.03		1018	0
04/09	1515	2.582	156.5	41.49	28.97		1018	0
04/09	1530	2.383	148	35.73	29.04		1018	0
04/09	1545	2.198	157.4	49.26	29.39		1018	0
04/09	1600	2.989	135.6	30.24	29.15		1017	0
04/09	1615	4.207	125.9	22.04	27.85		1017	0
04/09	1630	3.424	123.7	18.85	27.22		1017	0
04/09	1645	3.885	119.6	18.27	26.32		1017	0
04/09	1700	4.014	122	17.34	25.95		1017	0
04/09	1715	3.573	125.8	20.73	26.02		1017	0
04/09	1730	3.508	121.6	15.94	26.06		1017	0
04/09	1745	2.962	122.6	17.74	25.99		1018	0
04/09	1800	2.882	123	21.88	25.49		1018	0
04/09	1815	2.456	122.1	22.06	25.45		1018	0
04/09	1830	2.769	129.7	21.66	25.23		1018	0
04/09	1845	3.165	124.2	20.12	24.83		1018	0
04/09	1900	2.839	124.8	21.97	24.59		1018	0
04/09	1915	3.072	119.3	18.94	24.34		1018	0
04/09	1930	3.005	123.2	15.82	24.04		1018	0
04/09	1945	2.793	121.8	15.08	23.88		1018	0
04/09	2000	2.926	122.1	20.25	23.71		1018	0
04/09	2015	2.96	124.7	18.91	23.61		1018	0
04/09	2030	2.99	121.7	20.36	23.33		1018	0
04/09	2045	2.895	124.6	20.37	23.09		1018	0
04/09	2100	2.84	126.5	17.58	22.98		1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/09	2115	2.778	125.2	19.03	22.92		1018	0
04/09	2130	2.927	124.4	19.73	22.77		1018	0
04/09	2145	2.762	126.6	16.99	22.66		1019	0
04/09	2200	2.594	121.2	19.6	22.61		1019	0
04/09	2215	2.928	125.7	16.88	22.59		1018	0
04/09	2230	2.78	122.1	17.59	22.46		1018	0
04/09	2245	2.638	124.9	17.65	22.36		1018	0
04/09	2300	2.862	126.1	21.07	22.31		1018	0
04/09	2315	2.637	126.4	22.89	22.24		1018	0
04/09	2330	2.797	118.7	18.13	22.22		1018	0
04/09	2345	2.761	124.5	16.8	22.21		1017	0
04/10	0	2.694	130.9	19.66	22.21		1017	0
04/10	15	2.746	128.2	23.62	22.24		1017	0
04/10	30	3.011	128.5	21	22.31		1017	0
04/10	45	3.164	126.1	18.88	22.35		1017	0
04/10	100	3.223	127.4	24.79	22.37		1017	0
04/10	115	3.251	127	21.47	22.38		1017	0
04/10	130	2.799	129.8	20.75	22.34		1017	0
04/10	145	2.706	131.8	22	22.27		1017	0
04/10	200	2.527	132.8	25	22.18		1017	0
04/10	215	2.782	127.2	26.17	22.16		1017	0
04/10	230	2.817	124.4	20.05	22.06		1017	0
04/10	245	2.603	129.5	28.43	21.99		1016	0
04/10	300	2.655	126.2	21.73	21.94		1016	0
04/10	315	2.979	126.6	18.34	21.97		1016	0
04/10	330	2.768	120.7	17.59	22.03		1016	0

001160.0294

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/10	345	2.823	122.5	18.41	22.18		1016	0
04/10	400	2.379	119.3	18.27	22.24		1016	0
04/10	415	2.516	131.3	26.14	22.28		1016	0
04/10	430	2.595	124.3	19.24	22.35		1016	0
04/10	445	2.369	119.5	26.55	22.28		1016	0
04/10	500	2.021	127.4	20.08	22.22		1016	0
04/10	515	2.272	122.2	17.44	22.18		1016	0
04/10	530	2.14	120.1	17.94	22.11		1016	0
04/10	545	2.526	120.7	17.06	22.08		1017	0
04/10	600	2.935	128.4	22.79	22.06		1017	0
04/10	615	2.647	120.7	16.99	22.06		1017	0
04/10	630	3.046	122.2	19.14	22.03		1017	0
04/10	645	2.494	122.9	21.32	22.04		1017	0
04/10	700	2.447	120.9	20.81	22.14		1018	0
04/10	715	2.497	123.7	22	22.3		1018	0
04/10	730	2.539	111.6	13.97	22.35		1018	0
04/10	745	2.924	112.6	17.22	22.36		1018	0
04/10	800	3.221	112.1	14.39	22.49		1018	0
04/10	815	3.436	112.9	13.62	22.6		1018	0
04/10	830	3.33	126.4	18.45	22.93		1018	0
04/10	845	3.16	127.4	23.98	23.28		1018	0
04/10	900	3.404	121.1	19.08	23.42		1018	0
04/10	915	3.803	124.9	18.46	23.6		1018	0
04/10	930	3.247	124	19.94	23.93		1019	0
04/10	945	3.4	116.6	17.66	24.41		1019	0
04/10	1000	3.919	120.9	20.61	24.59		1019	0

001160.0295

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/10	1015	4.57	119.6	18.99	24.8		1019	0
04/10	1030	4.204	122.6	17.54	24.99		1019	0
04/10	1045	4.128	126.6	24.35	25.17		1019	0
04/10	1100	4.411	123.8	21.68	25.25		1019	0
04/10	1115	4.459	126.8	22.72	25.36		1019	0
04/10	1130	4.5	127.7	18.34	25.78		1019	0
04/10	1145	4.46	126.3	17.85	25.83		1019	0
04/10	1200	4.398	125	18.25	26.05		1019	0
04/10	1215	4.053	129.3	24.87	26.55		1019	0
04/10	1230	4.407	117.9	19.14	26.93		1019	0
04/10	1245	4.36	123.3	22.32	26.76		1019	0
04/10	1300	3.973	125.1	19.94	27.09		1019	0
04/10	1315	4.13	123.6	22.22	26.95		1019	0
04/10	1330	4.007	118.5	18.69	26.8		1019	0
04/10	1345	3.999	126	20.41	26.93		1019	0
04/10	1400	3.515	124.4	22.46	27.17		1019	0
04/10	1415	4.021	120.5	18.34	26.91		1019	0
04/10	1430	4.122	121.3	17.7	26.91		1019	0
04/10	1445	4.147	123.7	23.01	26.91		1019	0
04/10	1500	3.599	120	17.83	26.94		1019	0
04/10	1515	3.832	112.7	18.37	26.82		1019	0
04/10	1530	4.267	108	16.96	26.36		1018	0
04/10	1545	4.2	115.9	16.64	26.11		1019	0
04/10	1600	4.397	117.1	15.95	26.21		1018	0
04/10	1615	4.437	108.3	17.25	26.21		1018	0
04/10	1630	3.955	115.9	17.16	26.41		1018	0

001160.0296

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/10	1645	4.414	113.6	17.79	26.16		1018	0
04/10	1700	4.192	109.1	16.16	26.66		1018	0
04/10	1715	3.969	117.5	18.35	26.16		1018	0
04/10	1730	4.005	119.6	16.75	25.9		1018	0
04/10	1745	3.612	125.6	20.38	25.66		1018	0
04/10	1800	3.881	113	17.9	25.53		1018	0
04/10	1815	3.732	115	16.47	25.31		1018	0
04/10	1830	3.698	114.7	17.83	25.08		1018	0
04/10	1845	3.01	116.7	14.18	24.94		1018	0
04/10	1900	3.71	111.6	14.32	24.6		1018	0
04/10	1915	3.434	116.8	14.74	24.34		1018	0
04/10	1930	3.04	114.9	16.57	24.13		1018	0
04/10	1945	2.924	115	18.13	23.99		1018	0
04/10	2000	3.2	116.2	15.2	23.89		1018	0
04/10	2015	3.378	117.6	17.15	23.86		1017	0
04/10	2030	3.585	118.5	18.27	23.7		1018	0
04/10	2045	3.98	124.7	16.75	23.65		1018	0
04/10	2100	3.185	119.4	15.24	23.62		1018	0
04/10	2115	3.018	127.8	20.78	23.62		1018	0
04/10	2130	2.612	120.8	21.63	23.62		1018	0
04/10	2145	1.96	129.5	24.29	23.55		1019	0
04/10	2200	2.454	129.3	24.81	23.48		1019	0
04/10	2215	3.097	124	18.77	23.44		1019	0
04/10	2230	2.389	125.3	19.52	23.4		1018	0
04/10	2245	2.584	131.2	20.35	23.33		1018	0
04/10	2300	2.72	125.8	23.35	23.29		1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/10	2315	2.88	132	20.62	23.19		1018	0
04/10	2330	2.671	128.1	18.11	23.06		1018	0
04/10	2345	3.077	130	22.09	22.97		1018	0
04/11	0	2.92	127.4	22.72	22.92		1018	0
04/11	15	2.411	129.8	22.26	22.89		1018	0
04/11	30	2.164	137.6	22.22	22.9		1018	0
04/11	45	2.322	128.8	22.25	22.99		1018	0
04/11	100	2.785	127.1	20.57	23.05		1017	0
04/11	115	2.823	125.5	21.14	22.99		1017	0
04/11	130	2.992	127.6	19.14	22.95		1017	0
04/11	145	2.666	126.2	21.64	23.01		1017	0
04/11	200	2.694	131.5	24.67	23.14		1016	0
04/11	215	2.302	136.1	22.9	23.2		1016	0
04/11	230	2.432	129.2	26.76	23.27		1016	0
04/11	245	2.102	132.4	26.83	23.26		1016	0
04/11	300	1.927	135.7	28.49	23.32		1016	0
04/11	315	1.792	148.8	31.33	23.33		1016	0
04/11	330	1.316	147.4	37.1	23.39		1017	0
04/11	345	1.271	184.2	42.84	23.47		1017	0
04/11	400	1.079	208	37.68	23.46		1018	0
04/11	415	1.205	212.7	31.35	23.36		1018	0
04/11	430	0.654	179.2	53.26	23.28		1018	0
04/11	445	0.414	150.9	35.18	23.17		1018	0
04/11	500	0.941	129.2	21.42	23.12		1018	0
04/11	515	0.989	125.1	21.18	23.07		1018	0
04/11	530	0.738	139.9	19.39	22.8		1018	0

001160.0298

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/11	545	1.123	125.7	18.32	22.61		1018	0
04/11	600	0.891	132.2	29.28	22.47		1018	0
04/11	615	0.905	128.4	15.95	22.36		1018	0
04/11	630	0.724	132.5	16.99	22.33		1018	0
04/11	645	0.517	137.5	17.85	22.34		1018	0
04/11	700	1.141	126	17.75	22.43		1019	0
04/11	715	1.299	125	17.9	22.55		1019	0
04/11	730	1.291	131.1	21.3	22.73		1019	0
04/11	745	2.422	121	17.05	23.03		1018	0
04/11	800	1.897	132.5	23.67	23.3		1019	0
04/11	815	1.215	147.3	32.57	23.41		1019	0
04/11	830	1.234	142.7	24.43	23.44		1019	0
04/11	845	0.958	136.6	23.45	23.7		1020	0
04/11	900	0.791	134.2	40.24	23.89		1020	0
04/11	915	1.509	126.7	19.34	23.92		1019	0
04/11	930	2.066	124.3	16.47	24.38		1019	0
04/11	945	2.758	117.8	16.06	25.4		1019	0
04/11	1000	2.233	136.4	29.44	26.09		1019	0
04/11	1015	2.265	133.2	27.68	25.81		1019	0
04/11	1030	2.058	131.7	23.78	26		1019	0
04/11	1045	2.167	135.8	28.46	26.1		1019	0
04/11	1100	2.252	125.6	22.78	25.91		1019	0
04/11	1115	2.311	124.7	17.25	25.6		1019	0
04/11	1130	2.121	127.8	22.5	25.54		1019	0
04/11	1145	2.063	129.8	24.81	25.19		1019	0
04/11	1200	1.398	136.8	28.56	25		1019	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/11	1215	1.032	150.3	40.93	24.83		1019	0
04/11	1230	0.945	138.8	35.14	25.06		1019	0
04/11	1245	1.519	127.3	25.03	25.21		1018	0
04/11	1300	1.661	129.4	31.62	25.34		1018	0
04/11	1315	2.007	136.8	30.87	25.61		1018	0
04/11	1330	1.791	145.2	31.48	25.79		1018	0
04/11	1345	1.63	147.4	32.85	25.22		1017	0
04/11	1400	1.696	136.2	24.84	25.38		1017	0
04/11	1415	1.79	146	35.15	25.23		1017	0
04/11	1430	1.329	157.6	39.1	24.69		1017	0.01
04/11	1445	1.448	168.2	46.84	23.99		1017	0.04
04/11	1500	1.549	159.4	31.76	23.88		1017	0.02
04/11	1515	1.297	174.7	40.37	23.92		1016	0.01
04/11	1530	1.465	178.2	36.58	24.18		1016	0
04/11	1545	1.296	176.1	35.99	24.26		1016	0
04/11	1600	1.23	159.6	45.64	24.05		1016	0.01
04/11	1615	1.52	175.9	34.75	24.36		1016	0.01
04/11	1630	1.284	192.8	43	24.58		1016	0
04/11	1645	2.561	211.4	34.29	24.23		1016	0
04/11	1700	2.597	223	27.01	23.46		1016	0
04/11	1715	2.76	235.8	21.51	23.62		1016	0
04/11	1730	3.491	231.9	25.24	23.31		1017	0
04/11	1745	2.967	236.2	20.95	23.07		1017	0
04/11	1800	2.638	256.3	20.57	23.16		1017	0
04/11	1815	2.567	270.4	17.28	22.97		1017	0
04/11	1830	1.318	228.4	21.8	22.94		1017	0

001160.0300

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/11	1845	1.113	277.7	36.5	23.01		1017	0
04/11	1900	1.854	296.8	15.83	22.28		1017	0
04/11	1915	1.878	285.2	13.18	21.81		1017	0
04/11	1930	1.847	299.4	14.99	21.54		1017	0
04/11	1945	1.573	303.5	15.76	21.38		1017	0
04/11	2000	1.138	286.3	13.94	21.22		1017	0
04/11	2015	1.926	295.8	13.76	21.16		1017	0
04/11	2030	1.985	283.1	16.1	21.1		1017	0
04/11	2045	2.146	298.2	14.74	20.87		1018	0.01
04/11	2100	2.623	307.1	14.67	20.66		1018	0
04/11	2115	2.493	300.5	14.95	20.52		1018	0
04/11	2130	2.214	299.9	14.23	20.42		1018	0
04/11	2145	1.203	291.5	19.74	20.38		1018	0
04/11	2200	1.454	285.6	15.46	20.36		1018	0
04/11	2215	1.951	293.4	13.91	20.33		1018	0
04/11	2230	1.723	307.3	13.31	20.28		1018	0
04/11	2245	2.223	294.6	13.25	20.23		1018	0
04/11	2300	2.813	287.1	14.17	20.14		1018	0
04/11	2315	2.29	290.9	14.96	20.03		1018	0
04/11	2330	2.466	303.1	18.41	19.88		1018	0
04/11	2345	2.366	305.1	14.64	19.65		1018	0
04/12	0	1.854	308.9	14.04	19.57		1018	0
04/12	15	1.438	307.3	17.15	19.4		1018	0
04/12	30	1.05	294.4	14.61	19.36		1018	0
04/12	45	1.156	307.1	14.61	19.41		1018	0
04/12	100	0.942	312.8	17.24	19.48		1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/12	115	0.676	269.3	21.81	19.52		1018	0
04/12	130	1.301	291.4	17.84	19.54		1018	0
04/12	145	1.29	304.3	12.79	19.59		1018	0
04/12	200	1.606	304	15.12	19.65		1018	0
04/12	215	2.036	302.7	16.05	19.62		1018	0
04/12	230	1.539	307.6	15.48	19.5		1018	0
04/12	245	1.986	311	11.11	19.44		1019	0
04/12	300	3.698	316.3	16.49	19.25		1018	0
04/12	315	3.139	322.8	14.9	18.44		1018	0
04/12	330	1.919	325.9	13.28	18.26		1018	0
04/12	345	2.488	323.9	15.75	18.71		1018	0
04/12	400	3.435	326.5	15.97	18.85		1018	0
04/12	415	2.857	329.1	13.36	18.58		1018	0
04/12	430	3.251	332.5	14.15	18.34		1018	0
04/12	445	2.167	320.6	12.73	18.11		1018	0
04/12	500	2.21	326	14.73	18.02		1018	0
04/12	515	1.509	335.7	16.01	18.07		1018	0
04/12	530	1.577	338.9	15.84	18.12		1018	0
04/12	545	0.879	345.5	21.82	18.18		1018	0
04/12	600	0.589	328.2	24.53	18.24		1018	0
04/12	615	0.207	294.7	30.82	17.79		1018	0
04/12	630	0.539	32.8	49.34	17.59		1018	0
04/12	645	0.367	95.3	18.83	17.41		1018	0
04/12	700	0.513	247.2	22.54	17.4		1019	0
04/12	715	0.436	181.8	12.7	17.28		1019	0
04/12	730	0.276	150.3	20.04	17.41		1019	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/12	745	0.278	184.8	5.514	17.55		1019	0
04/12	800	0.761	176.1	14.17	17.81		1019	0
04/12	815	0.52	158.3	35.63	18.49		1019	0
04/12	830	0.419	206.9	24.43	19.22		1020	0
04/12	845	0.724	121.7	12.81	19.11		1019	0
04/12	900	0.686	135.6	20.34	19.15		1020	0
04/12	915	0.905	126.1	22.84	19.58		1019	0
04/12	930	0.476	128.8	20.84	19.78		1020	0
04/12	945	0.625	147.3	29.16	20.02		1020	0
04/12	1000	0.711	106.9	19.18	19.85		1020	0
04/12	1015	1.043	105	29.56	20.25		1020	0
04/12	1030	1.265	68.53	33.15	21.16		1020	0
04/12	1045	1.519	102.1	22.18	21.3		1020	0
04/12	1100	1.852	112.4	22.92	21.75		1020	0
04/12	1115	2.172	90.2	19.93	21.73		1020	0
04/12	1130	1.672	76.9	25.07	22.15		1020	0
04/12	1145	1.748	102.2	29.91	22.21		1020	0
04/12	1200	1.961	94.9	22.46	22.35		1019	0
04/12	1215	2.227	104.8	22.6	22.34		1019	0
04/12	1230	2.295	97.2	22.95	22.86		1019	0
04/12	1245	2.213	108.1	25.16	23.18		1019	0
04/12	1300	2.759	103.3	16.9	23.15		1019	0
04/12	1315	2.518	79.6	20.58	23.4		1019	0
04/12	1330	2.685	100.8	23.04	23.77		1018	0
04/12	1345	2.684	101.6	17.06	23.67		1018	0
04/12	1400	2.687	95.6	22.07	24.25		1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/12	1415	2.199	100.3	19.17	24.37		1018	0
04/12	1430	2.376	93.7	19.52	24.92		1018	0
04/12	1445	2.74	88.6	22.74	24.68		1018	0
04/12	1500	1.99	96.3	30.45	24.78		1017	0
04/12	1515	1.989	76.7	35.48	25.2		1017	0
04/12	1530	2.215	89.2	21.87	25.47		1017	0
04/12	1545	2.75	80.3	18.98	25.74		1017	0
04/12	1600	2.229	94.9	25.27	25.39		1016	0
04/12	1615	1.588	155.7	31.82	25.29		1016	0
04/12	1630	1.685	136.7	30.19	25.07		1016	0
04/12	1645	1.848	138.6	24.8	24.64		1016	0
04/12	1700	1.995	125.4	24.2	24.53		1016	0
04/12	1715	2.127	132.8	20.82	23.97		1016	0
04/12	1730	1.658	131.8	27.26	23.69		1016	0
04/12	1745	1.587	140.5	27.47	23.67		1015	0
04/12	1800	2.192	124.5	21.53	23.68		1015	0
04/12	1815	1.726	127.2	23.19	23.05		1015	0
04/12	1830	1.715	125.4	21.98	22.58		1015	0
04/12	1845	1.383	131	19.5	22.3		1015	0
04/12	1900	1.06	135.9	21.92	22.11		1015	0
04/12	1915	1.089	132.9	17.95	21.72		1015	0
04/12	1930	0.785	138	21.48	21.44		1015	0
04/12	1945	0.67	138.8	17.98	21.41		1015	0
04/12	2000	0.649	132	14.86	21.29		1015	0
04/12	2015	0.698	146	27.36	20.85		1015	0
04/12	2030	0.952	128.9	15.85	20.25		1015	0

001160.0304

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/12	2045	0.738	136.2	23.5	20.12		1015	0
04/12	2100	0.739	167.1	30.21	19.73		1016	0
04/12	2115	0.913	140.5	26.25	19.52		1016	0
04/12	2130	1.066	135.7	23.95	19.25		1016	0
04/12	2145	0.653	140	24.41	18.85		1016	0
04/12	2200	0.48	134	15.62	18.7		1017	0
04/12	2215	0.599	126.9	19.02	18.6		1016	0
04/12	2230	0.877	131.2	17.52	18.84		1016	0
04/12	2245	0.747	133.1	15.87	18.49		1016	0
04/12	2300	0.749	138.7	21.92	18.19		1016	0
04/12	2315	0.427	154.3	24.86	18.01		1016	0
04/12	2330	0.541	147.8	15.01	17.51		1016	0
04/12	2345	0.42	119.8	11.74	17.31		1016	0
04/13	0	0.509	124.2	9.1	16.94		1016	0
04/13	15	0.674	133.9	12.56	16.8		1016	0
04/13	30	0.647	128.1	13.6	17.14		1016	0
04/13	45	0.554	129.2	12.11	16.77		1016	0
04/13	100	0.757	132.3	13.81	17.04		1016	0
04/13	115	0.746	131.6	9.95	16.99		1015	0
04/13	130	0.592	140	13.48	16.96		1015	0
04/13	145	0.533	146.8	6.488	16.99		1015	0
04/13	200	0.379	144.4	7.48	16.61		1015	0
04/13	215	0.393	130.6	2.549	16.37		1015	0
04/13	230	0.536	130.8	6.841	16.4		1015	0
04/13	245	0.29	127.4	4.84	16.43		1015	0
04/13	300	0.031	121.5	2.618	16.46		1015	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/13	315	0.134	100.5	0	16.43		1015	0
04/13	330	0	100.5	0	16.43		1015	0
04/13	345	0	100.7	0	16.28		1015	0
04/13	400	0.016	100.4	0	16.36		1015	0
04/13	415	0.537	94.3	6.065	16.67		1014	0
04/13	430	0.322	125.5	22.38	17.1		1015	0
04/13	445	0.231	100.8	11.65	17.32		1014	0
04/13	500	0.32	97.4	2.69	17.7		1015	0
04/13	515	0.025	117.4	2.848	18.12		1015	0
04/13	530	0.378	110.6	3.297	18.42		1015	0
04/13	545	0.281	114.9	9.42	18.74		1015	0
04/13	600	0.476	104.2	9.67	19.13		1015	0
04/13	615	0.58	118.1	15.93	19.6		1015	0
04/13	630	0.738	121.5	19.89	20.24		1015	0
04/13	645	0.925	125.1	16.74	20.6		1015	0
04/13	700	0.969	125.8	19.05	20.77		1015	0
04/13	715	0.881	118.8	14.93	20.83		1015	0
04/13	730	0.841	120.4	15.64	21.06		1016	0
04/13	745	1.163	114.4	12.43	21.36		1016	0
04/13	800	1.316	116.9	13.87	21.61		1016	0
04/13	815	1.206	119.8	19.22	21.96		1016	0
04/13	830	1.159	141.2	29.43	22.52		1016	0
04/13	845	1.03	145.1	35.99	22.96		1016	0
04/13	900	1.19	161.2	33.57	23.61		1016	0
04/13	915	1.242	170.2	36.59	24.3		1016	0
04/13	930	1.349	162.5	41.24	24.98		1016	0

001160.0306

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/13	945	1.527	181.9	37.41	25.65		1016	0
04/13	1000	1.594	190.6	39.95	25.92		1016	0
04/13	1015	1.56	175.1	40.42	26.46		1016	0
04/13	1030	1.687	162.6	40.49	26.55		1016	0
04/13	1045	1.863	191	40.4	26.53		1016	0
04/13	1100	1.722	205.2	33.33	26.38		1016	0
04/13	1115	1.686	209.3	32.74	26.98		1016	0
04/13	1130	2.567	211.3	35.18	27.13		1016	0
04/13	1145	2.26	204.4	32.76	27.86		1016	0
04/13	1200	2.018	161.9	42.53	27.49		1016	0
04/13	1215	1.479	179.6	42.75	27.41		1016	0
04/13	1230	1.943	194.5	37.67	27.56		1015	0
04/13	1245	2.279	175.8	39.26	28.06		1015	0
04/13	1300	1.81	178.3	47.67	28.48		1015	0
04/13	1315	1.82	167.8	41.84	28.71		1015	0
04/13	1330	1.874	200.4	34.1	29.01		1015	0
04/13	1345	1.822	202.5	35.33	28.6		1015	0
04/13	1400	1.973	195.1	41.45	28.44		1015	0
04/13	1415	2.092	192.7	34.64	28.27		1015	0
04/13	1430	1.991	192.9	40.61	28.51		1014	0
04/13	1445	1.869	197.7	42.94	28.35		1014	0
04/13	1500	2.143	210.4	30.86	28.25		1014	0
04/13	1515	3.02	208.3	32.17	28.11		1014	0
04/13	1530	2.138	199.9	30.75	28.22		1014	0
04/13	1545	1.693	191.8	41.2	28.24		1014	0
04/13	1600	1.911	181	32.95	28.33		1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/13	1615	1.86	184.9	41.34	28.41		1014	0
04/13	1630	1.502	183	41.77	28.23		1013	0
04/13	1645	1.518	160.8	35.42	27.83		1013	0
04/13	1700	1.549	166.6	41.51	27.41		1013	0
04/13	1715	1.506	165.3	45.81	27.24		1013	0
04/13	1730	1.317	166.1	39.95	27.01		1013	0
04/13	1745	1.459	163.3	40.92	26.68		1013	0
04/13	1800	1.045	148	41.97	26.42		1013	0
04/13	1830	1.306	130.3	32.67	26.29	71.9	1013	0
04/13	1845	1.236	131.7	25.87	26.03	77.1	1014	0
04/13	1900	1.242	138	26.83	25.92	80.3	1014	0
04/13	1915	1.434	129.7	21.13	25.78	82.8	1014	0
04/13	1930	1.408	133.3	28.36	25.66	84.9	1013	0
04/13	1945	1.63	137.1	30.91	25.5	86.1	1013	0
04/13	2000	1.729	130.7	23.98	25.47	86.9	1013	0
04/13	2015	1.775	134.1	22.8	25.39	88	1014	0
04/13	2030	1.763	137.2	25	25.27	89.3	1014	0
04/13	2045	2.002	131.6	25.66	25.22	90.3	1014	0
04/13	2100	1.511	141	30.03	25.17	91.3	1014	0
04/13	2115	1.603	137	28.02	25.14	91.9	1014	0
04/13	2130	1.385	148.9	34.9	25.19	92.2	1015	0
04/13	2145	0.99	152.5	41.09	25.2	92.7	1015	0
04/13	2200	1.166	147.8	34.1	25.19	92.9	1015	0
04/13	2215	1.328	141.7	34.36	25.18	93	1015	0
04/13	2230	1.933	129.3	27.24	25.1	93.3	1015	0
04/13	2245	2.263	142.3	31.39	24.89	93.9	1014	0

001160.0308

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/13	2300	2.022	140.1	26.97	24.8	94.3	1015	0
04/13	2315	1.653	139.8	32.37	24.79	94.6	1014	0
04/13	2330	2.122	129.9	24.37	24.74	94.2	1014	0
04/13	2345	2.32	128.7	26.99	24.56	95.3	1014	0
04/14	0	2.251	131.3	25.55	24.52	95.4	1014	0
04/14	15	1.376	142.9	40.88	24.62	95	1014	0
04/14	30	1.257	157.5	40.97	24.69	94.4	1014	0
04/14	45	1.302	148.2	37.16	24.67	94.2	1014	0
04/14	100	1.427	153	35.91	24.64	93.9	1014	0
04/14	115	1.404	146.5	36.54	24.53	93.9	1014	0
04/14	130	1.133	155.2	37.04	24.5	94.1	1014	0
04/14	145	1.029	184.7	35.3	24.42	94.3	1014	0
04/14	200	0.932	205.3	34.2	24.39	94.5	1015	0
04/14	215	0.957	218.3	28.57	24.37	94.6	1015	0
04/14	230	0.683	208.3	41.13	24.43	94.2	1015	0
04/14	245	1.051	212.4	27.45	24.61	92.5	1015	0
04/14	300	1.012	220.5	34.93	24.7	91.5	1015	0
04/14	315	0.82	195.7	46.62	24.65	91.8	1014	0
04/14	330	0.949	163	41.59	24.45	92.4	1014	0
04/14	345	1.549	126.3	20.68	24.2	94	1014	0
04/14	400	2.029	127.9	21.55	24.12	94.6	1013	0
04/14	415	1.664	136.1	22.7	23.98	95.2	1013	0
04/14	430	2.814	127	23.57	23.77	95.9	1013	0
04/14	445	2.036	136.4	31.18	23.78	95.4	1013	0
04/14	500	1.601	136.3	27.86	23.75	95.3	1013	0
04/14	515	1.616	131.2	27.08	23.74	95.6	1013	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/14	530	1.452	144.3	32.44	23.77	96.4	1014	0
04/14	545	0.948	188.1	40.55	23.87	97.6	1014	0
04/14	600	0.719	172.5	48.59	23.98	98.2	1015	0
04/14	615	0.853	203.1	37.39	24.08	98.3	1015	0
04/14	630	0.957	206.3	33.25	24.18	98	1015	0
04/14	645	0.961	202.1	33.38	24.16	98.3	1016	0
04/14	700	0.78	197.6	40.87	24.17	98.3	1016	0
04/14	715	0.691	186.8	43.37	24.24	97.9	1016	0
04/14	730	0.568	141.3	30.75	24.28	97.9	1016	0
04/14	745	0.548	147.8	33.96	24.41	97.5	1016	0
04/14	800	0.568	197.7	36.69	24.67	96.3	1016	0
04/14	815	0.855	153.6	29.53	24.8	95.4	1016	0
04/14	830	0.701	156.4	31.49	25.06	94.9	1016	0
04/14	845	1.036	153	40.98	25.57	92.5	1016	0
04/14	900	1.894	129.9	26.22	25.4	92.3	1016	0
04/14	915	2.194	128.1	27.57	25.84	91.1	1015	0
04/14	930	2.751	132.6	22.5	26.04	89.8	1015	0
04/14	945	1.432	133.4	33.48	26.39	88.2	1015	0
04/14	1000	2.117	147.3	37.99	26.53	86.6	1016	0
04/14	1015	1.876	153.1	32.81	26.45	86.1	1016	0
04/14	1030	2.165	152.7	38.26	26.55	85.6	1016	0
04/14	1045	1.839	155.1	37.66	26.76	84.8	1016	0
04/14	1100	1.863	153	40.62	26.91	84.6	1016	0
04/14	1115	1.601	159.7	49.18	27.51	83.1	1016	0
04/14	1130	1.804	183	41.61	27.72	81.5	1016	0
04/14	1145	2.193	176.9	37.76	27.75	81	1016	0

001160.0310

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/14	1200	1.844	195.6	37.81	27.99	79.8	1016	0
04/14	1215	2.036	188.6	40.94	28.53	76.7	1016	0
04/14	1230	1.981	165.3	40.95	28.53	74.7	1016	0
04/14	1245	2.003	171.9	41.02	29.22	71.7	1015	0
04/14	1300	2.031	167.3	46.23	28.87	71	1015	0
04/14	1315	1.867	183.5	42.28	28.11	72.7	1015	0
04/14	1330	2.095	195.6	40.23	28.29	72.4	1015	0
04/14	1345	2.172	198.2	38.8	28.9	70.1	1015	0
04/14	1400	2.548	195.4	34.86	28.63	69.05	1015	0
04/14	1415	2.618	201.1	46.5	28.13	69.77	1015	0
04/14	1430	2.269	198.7	36.48	28.01	69.52	1014	0
04/14	1445	2.226	197.6	44.29	27.76	70.4	1015	0
04/14	1500	1.445	192.1	51.57	27.36	72.7	1014	0
04/14	1515	1.481	174.2	48.25	27.05	75.2	1014	0
04/14	1530	1.558	193.5	37.85	26.98	76.7	1014	0
04/14	1545	1.869	185.6	35.95	27.22	76.2	1013	0
04/14	1600	2.383	191.7	37.76	27.86	73.8	1013	0
04/14	1615	2.201	210.7	40.67	28.14	72	1013	0
04/14	1630	2.857	199.6	37.16	27.98	71.1	1013	0
04/14	1645	3.393	211	30	28.03	70.7	1013	0
04/14	1700	3.713	199	27.47	27.74	71.2	1012	0
04/14	1715	2.984	213.8	33.69	27.99	71.1	1012	0
04/14	1730	3.04	208.9	37.42	27.8	71.8	1012	0
04/14	1745	3.083	218.5	29.17	27.44	73.2	1013	0
04/14	1800	3.092	220.1	27.95	27	75.4	1014	0
04/14	1815	3.94	228.9	24.8	26.79	76	1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/14	1830	3.788	222.2	23.21	26.58	77.5	1015	0
04/14	1845	3.237	231	22.38	26.51	78.6	1015	0
04/14	1900	2.955	224.2	25.96	26.52	79.3	1015	0
04/14	1915	2.769	227	17.35	26.43	80.1	1016	0
04/14	1930	2.099	229.6	20.29	26.41	80.5	1016	0
04/14	1945	1.843	213.4	24.03	26.35	80.9	1016	0
04/14	2000	1.468	222.4	26.51	26.32	81	1016	0
04/14	2015	1.475	241.9	21.87	26.22	81.9	1017	0
04/14	2030	1.683	254.6	16.12	26.18	82.6	1017	0
04/14	2045	3.714	333.8	32.67	24.51	81.3	1018	0
04/14	2100	5.419	357.1	17.69	21.38	80.6	1019	0
04/14	2115	5.38	4.132	13.77	20.95	83.2	1019	0
04/14	2130	4.433	359.4	12.31	20.22	88.8	1019	0.03
04/14	2145	3.266	14.35	19.07	19.76	93.2	1019	0.03
04/14	2200	2.877	35.38	18.95	19.64	95.2	1019	0.02
04/14	2215	1.555	50.21	24.04	19.67	96.9	1020	0.01
04/14	2230	1.63	68.4	22.92	19.65	98.5	1020	0.04
04/14	2245	2.037	55.53	17.51	19.5	99.3	1019	0.01
04/14	2300	2.306	95.4	43.8	19.45	99.9	1020	0.01
04/14	2315	1.896	104.3	31.16	19.44	100.6	1020	0
04/14	2330	2.571	85.8	19.05	19.63	100.6	1019	0
04/14	2345	2.484	97.1	21.61	19.71	99.5	1019	0
04/15	0	2.547	90.4	17.51	20.02	99.3	1019	0
04/15	15	2.346	81.9	31.12	20.38	98.3	1019	0
04/15	30	1.47	236.9	77.3	20.37	98.4	1019	0
04/15	45	1.346	93.8	38.55	20.47	98.8	1020	0.01

001160.0312

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/15	100	2.332	80.9	15.03	20.57	98.4	1019	0.01
04/15	115	2.511	96.4	17.6	20.34	99.7	1020	0.03
04/15	130	1.315	149.7	25.92	20.32	101.7	1020	0.13
04/15	145	1.105	138.6	21.22	20.16	103.1	1020	0.07
04/15	200	0.921	143.8	33.19	19.88	103.8	1020	0.04
04/15	215	1.521	134	26.4	19.78	104.4	1019	0.06
04/15	230	1.125	152.2	32	19.72	104.7	1020	0.04
04/15	245	0.902	146.8	38.49	19.71	105	1019	0.04
04/15	300	0.752	154.1	38.4	19.72	104.9	1019	0.04
04/15	315	0.626	144.8	42.33	19.78	105.3	1019	0.04
04/15	330	0.676	139.7	36.88	19.81	105.5	1019	0.03
04/15	345	0.913	150.3	33.61	19.88	105.5	1019	0.02
04/15	400	0.865	140.1	27.29	19.93	105.7	1019	0
04/15	415	0.743	144.1	39.24	19.97	105.5	1019	0.01
04/15	430	0.504	145.7	33.82	20.01	105.1	1019	0.01
04/15	445	0.661	118.3	19.35	20.03	105.3	1019	0.01
04/15	500	0.367	125.6	20.77	20.03	105	1019	0
04/15	515	0.343	196.4	61.41	19.97	105.3	1019	0
04/15	530	0.146	251	9.62	19.94	105.8	1020	0
04/15	545	0.215	292.9	29.38	19.89	106.2	1020	0
04/15	600	0.237	317.6	17.76	19.91	106.3	1020	0
04/15	615	0.638	347.6	18.75	19.99	106.3	1020	0
04/15	630	0.752	337.3	32.69	20.07	106.3	1021	0
04/15	645	1	58.05	19.39	20.21	105.9	1021	0
04/15	700	1.027	354.7	28.72	20.31	105.1	1021	0
04/15	715	1.485	323.6	10.64	20.45	104.8	1022	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/15	730	2.135	324.9	12.09	20.82	103.5	1022	0
04/15	745	2.217	337.5	13.09	21.15	102.7	1022	0
04/15	800	3.421	346.3	13.77	21.06	102.9	1022	0
04/15	815	3.234	346.4	14.07	21.06	102.8	1023	0
04/15	830	3.034	342.9	11.37	21.12	102.2	1023	0
04/15	845	3.742	344.4	14.07	20.93	101.5	1023	0
04/15	900	3.813	355.1	21.03	21.02	99.9	1023	0
04/15	915	3.37	356.6	22.93	21.39	97.6	1023	0
04/15	930	4.422	356.4	15.43	21.03	96.5	1023	0
04/15	945	4.471	4.102	14.03	20.95	96.2	1023	0
04/15	1000	4.271	4.199	12.35	21.18	95.1	1023	0
04/15	1015	3.702	23.8	18.5	21.2	94.7	1023	0
04/15	1030	3.391	15.69	18.8	21.28	94.2	1023	0
04/15	1045	3.478	21.49	18.39	21.3	92.9	1023	0
04/15	1100	4.021	21.56	18.77	21.52	89.6	1023	0
04/15	1115	4.479	15.19	17.71	21.43	86.4	1024	0
04/15	1130	3.94	18.54	18.66	21.08	86.5	1024	0
04/15	1145	4.422	29.15	19.53	21.04	85.1	1024	0
04/15	1200	4.825	22.97	19.36	20.93	83.1	1024	0
04/15	1215	4.328	18.54	19.75	20.9	79.3	1024	0
04/15	1230	4.539	25.81	21.09	20.76	74.8	1024	0
04/15	1245	4.68	9.38	15.44	20.86	71.5	1024	0
04/15	1300	4.015	18.68	18.11	21.07	68.38	1024	0
04/15	1315	4.432	17.04	17.06	20.52	68.39	1024	0
04/15	1330	3.728	17.87	19.59	20.36	66	1024	0
04/15	1345	3.553	24.55	21.24	20.37	63.54	1024	0

001160.0314

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/15	1400	2.918	23.81	18.17	20.54	60.8	1024	0
04/15	1415	3.115	27.09	19.18	20.6	56.76	1024	0
04/15	1430	2.966	26.3	19.53	20.52	54.2	1024	0
04/15	1445	3.205	16.17	20.41	20.33	51.54	1024	0
04/15	1500	3.082	13.94	17.84	20.32	50.65	1024	0
04/15	1515	3.117	17.76	20.33	20.45	49.87	1024	0
04/15	1530	3.444	25.21	20.04	20.71	50.08	1023	0
04/15	1545	3.721	17.64	19.67	20.93	49.25	1024	0
04/15	1600	3.422	1.579	19.23	20.66	52.28	1024	0
04/15	1615	3.576	0.429	17.84	20.24	54.38	1024	0
04/15	1630	3.656	356.3	18.26	20.11	52.66	1023	0
04/15	1645	2.938	18.05	17.5	20.23	51.31	1023	0
04/15	1700	2.764	15.07	16.43	20.2	50.63	1023	0
04/15	1715	2.316	25.87	20.08	20.3	50.77	1023	0
04/15	1730	1.77	12.48	24.89	20.54	50.64	1023	0
04/15	1745	1.983	0.987	15.98	20.61	50.28	1023	0
04/15	1800	2.444	1.477	14.74	20.54	50.28	1023	0
04/15	1815	2.243	7.08	13.54	20.59	50.15	1023	0
04/15	1830	2.48	8.63	17.77	20.4	50.26	1023	0
04/15	1845	3.122	0.722	9.98	20.25	49.71	1023	0
04/15	1900	2.647	0.427	15.64	20.13	49.73	1023	0
04/15	1915	1.962	356.6	18.58	19.96	50.94	1023	0
04/15	1930	1.935	353.8	13.85	19.92	51.91	1023	0
04/15	1945	2.556	4.022	15.23	20.12	50.15	1023	0
04/15	2000	1.803	353.2	15.54	19.98	50.33	1024	0
04/15	2015	1.987	1.473	11.46	19.98	50.5	1024	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/15	2030	1.52	8.45	13.69	20.04	50.67	1024	0
04/15	2045	1.415	7.26	15.77	20.12	50.43	1024	0
04/15	2100	1.446	0.882	13.06	20.07	50.79	1024	0
04/15	2115	2.012	1.069	12.86	20.24	50.07	1024	0
04/15	2130	1.431	352.9	15.27	20.22	50.95	1024	0
04/15	2145	1.918	357.8	11.91	20.25	51.84	1024	0
04/15	2200	1.896	3.513	13.6	20.35	51.22	1024	0
04/15	2215	1.642	6.317	14.96	20.45	50.89	1023	0
04/15	2230	1.872	24.34	17.49	20.58	49.82	1023	0
04/15	2245	1.575	36.97	14.2	20.57	48.89	1023	0
04/15	2300	1.526	31.62	13.6	20.45	49.75	1023	0
04/15	2315	1.265	25.81	13.86	20.41	50.64	1023	0
04/15	2330	1.694	21.8	17.56	20.49	51.19	1023	0
04/15	2345	1.774	6.248	12.5	20.51	51.87	1023	0
04/16	0	1.77	15.25	16.78	20.44	52.4	1023	0
04/16	15	2.097	9.24	14.96	20.51	51.28	1023	0
04/16	30	1.608	355.6	19.49	20.2	52.6	1023	0
04/16	45	2.449	6.446	11.33	20.22	52.93	1023	0
04/16	100	2.518	15.22	16.23	20.09	53.71	1023	0
04/16	115	2.384	22.02	20.68	19.92	54.8	1023	0
04/16	130	2.351	12.61	14.18	19.76	56.39	1023	0
04/16	145	2.072	11.64	16.86	19.67	56.15	1024	0
04/16	200	2.681	35.1	18.15	19.71	52.92	1024	0
04/16	215	2.866	38.03	15.58	19.44	50.55	1024	0
04/16	230	2.175	39.88	11.64	19.15	50.9	1023	0
04/16	245	2.216	45.59	16.73	18.94	51.22	1023	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/16	300	1.764	34.73	17.87	18.76	51.3	1024	0
04/16	315	2.065	27.25	14.46	18.7	50.22	1024	0
04/16	330	1.948	31.61	15.74	18.62	49.48	1024	0
04/16	345	1.797	42.16	18.69	18.39	49.99	1024	0
04/16	400	2.262	33.94	16.35	18.22	50.87	1024	0
04/16	415	1.868	30.37	16.33	18.09	50.74	1024	0
04/16	430	1.89	34.26	12.89	17.95	50.66	1024	0
04/16	445	2.34	30.35	13.93	17.99	50.68	1024	0
04/16	500	2.106	42.21	13.68	17.86	50.83	1024	0
04/16	515	1.876	40.04	12.77	17.65	51.06	1024	0
04/16	530	1.79	36.68	14.63	17.52	51.06	1025	0
04/16	545	2.085	35.82	13.73	17.5	51.36	1025	0
04/16	600	1.884	46.41	14.09	17.33	52.44	1025	0
04/16	615	1.682	51.32	14.57	17.09	53.53	1025	0
04/16	630	1.609	50.65	16.61	16.89	53.89	1025	0
04/16	645	1.457	40.77	13.97	16.7	53.98	1025	0
04/16	700	1.261	44.05	17.64	16.7	53.71	1025	0
04/16	715	1.144	46.46	17.77	16.89	52.87	1025	0
04/16	730	1.525	53.34	15.09	17.21	51.73	1026	0
04/16	745	1.538	54.17	16.31	17.88	50.52	1026	0
04/16	800	2.504	59.24	15.52	18.17	49.38	1026	0
04/16	815	2.538	53.75	18.28	18.32	49.06	1026	0
04/16	830	2.652	64.78	14.72	18.46	48.39	1026	0
04/16	845	2.943	60.8	19.1	18.88	47.6	1026	0
04/16	900	2.427	59.69	19.74	18.79	48.03	1026	0
04/16	915	2.631	70.6	19.12	18.98	48.81	1026	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/16	930	3.205	80.1	17.91	19.19	49.46	1026	0
04/16	945	2.907	75.2	16.75	19.57	50.6	1026	0
04/16	1000	3.222	78.3	17.3	20.09	51.56	1026	0
04/16	1015	3.549	84.8	14.79	20.56	52.28	1026	0
04/16	1030	3.41	77.8	18.62	20.81	51.9	1026	0
04/16	1045	3.839	79.2	16.01	21.02	44.35	1026	0
04/16	1100	3.606	76.2	15.49	21.29	42.16	1026	0
04/16	1115	3.853	74.6	13.62	21.4	40.13	1026	0
04/16	1130	3.565	80	17.16	21.49	39.06	1026	0
04/16	1145	3.942	78.2	16.73	21.94	38.73	1026	0
04/16	1200	4.109	76.8	20.54	22.38	38.05	1026	0
04/16	1215	4.512	77	19.57	22.98	37.06	1026	0
04/16	1230	4.889	82	17.85	22.3	33.08	1026	0
04/16	1245	4.602	91.5	13.43	21.8	31.55	1026	0
04/16	1300	3.364	83.8	15.68	22.03	34.31	1026	0
04/16	1315	3.354	81	17.64	22.55	33.89	1026	0
04/16	1330	4.244	81.2	15.08	22.53	33.56	1026	0
04/16	1345	3.749	84.5	21.59	22.47	33.79	1026	0
04/16	1400	3.727	91.4	16.14	22.82	32.86	1025	0
04/16	1415	3.801	85.7	17.96	23.24	31.71	1025	0
04/16	1430	4.128	89.2	18.36	23.35	31.49	1025	0
04/16	1445	3.717	93.1	16.5	23.17	31.23	1025	0
04/16	1500	3.583	93.9	17.52	23	30.52	1025	0
04/16	1515	3.922	96	14.64	23.26	29.23	1024	0
04/16	1530	4.071	90.5	15.94	23.46	29.78	1024	0
04/16	1545	4.168	93.1	16.76	23.6	29.77	1024	0

001160.0318

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/16	1600	4.274	87.4	16.47	23.52	28.12	1024	0
04/16	1615	3.846	97.2	17.4	23.36	28.17	1024	0
04/16	1630	4.078	96	16.58	23.63	26.71	1024	0
04/16	1645	4.172	91.4	15.23	23.84	24.89	1024	0
04/16	1700	3.719	99.3	16.26	23.87	23.93	1023	0
04/16	1715	3.47	103.4	20.6	23.92	22.59	1023	0
04/16	1730	2.736	111.4	19.19	24.19	21.63	1023	0
04/16	1745	2.476	118.6	17.6	24.16	20.74	1023	0
04/16	1800	2.745	127.1	20.82	23.66	20.7	1023	0
04/16	1815	2.405	132.8	22.75	23.46	21.66	1023	0
04/16	1830	1.809	134.1	23.73	22.86	24.1	1023	0
04/16	1845	1.56	133.5	27.01	22.45	25.57	1023	0
04/16	1900	1.377	130.1	21.12	22.13	25.96	1023	0
04/16	1915	1.105	138.8	20.98	21.72	26.93	1023	0
04/16	1930	1.112	137.7	21.28	21.34	28.79	1023	0
04/16	1945	0.804	133.4	14.46	20.87	30.7	1023	0
04/16	2000	0.677	147.5	18.83	20.33	33.74	1023	0
04/16	2015	0.494	145.6	17.72	19.95	36.81	1023	0
04/16	2030	0.607	158.5	22.1	19.94	38.42	1023	0
04/16	2045	0.509	162.5	22.86	20.1	40.1	1023	0
04/16	2100	0.53	140.5	26.28	20.02	41.16	1023	0
04/16	2115	0.576	146.4	23.92	20.13	41.48	1023	0
04/16	2130	0.28	151.6	30.8	19.78	42.66	1024	0
04/16	2145	0.407	170.6	12.83	19.11	46.46	1024	0
04/16	2200	0.21	169.5	12.47	18.55	50.64	1024	0
04/16	2215	0	172.3	0.948	18.28	53.85	1024	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/16	2230	0.371	304.3	4.936	18.32	56.16	1024	0
04/16	2245	0.054	305.1	22.14	18.24	56.54	1023	0
04/16	2300	0	166.1	16.63	17.96	57.48	1023	0
04/16	2315	0.139	238.4	63.52	17.63	60.15	1023	0
04/16	2330	0	298.5	0	17.02	62.81	1023	0
04/16	2345	0	298.5	0	16.45	66.37	1023	0
04/17	0	0.022	258.2	7.3	16.04	68.79	1023	0
04/17	15	0	256.2	1.565	15.7	70.5	1023	0
04/17	30	0	254.7	0.369	15.29	72.5	1023	0
04/17	45	0	254.7	0.368	14.68	76.6	1023	0
04/17	100	0	254.7	0.369	14.37	80.6	1023	0
04/17	115	0	254.8	0.369	14.32	82.4	1023	0
04/17	130	0	254.8	0.376	14.22	83.2	1023	0
04/17	145	0	255	0.39	14.29	84.2	1023	0
04/17	200	0	255.2	0.368	14.56	84.9	1022	0
04/17	215	0	255.2	0.367	14.61	84.9	1022	0
04/17	230	0	256.6	1.225	13.98	86.1	1022	0
04/17	245	0	257.4	0.346	14.05	86.4	1022	0
04/17	300	0	256.9	0.483	13.87	84.6	1022	0
04/17	315	0	256.9	0.539	13.24	85.7	1022	0
04/17	330	0	257.4	0.34	13.28	87.9	1022	0
04/17	345	0.06	255.1	3.868	13.64	87.1	1022	0
04/17	400	0.037	222	0.996	13.57	86.7	1022	0
04/17	415	0	221.4	0.584	13.61	87.6	1022	0
04/17	430	0	221.2	0.503	14.03	87.2	1022	0
04/17	445	0	221.3	0.506	14.23	87	1022	0

001160.0320

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/17	500	0.231	314.1	7.9	14.54	87.2	1022	0
04/17	515	0.01	320.7	0.889	14.57	86.9	1022	0
04/17	530	0.107	327.5	0	14.52	87.8	1022	0
04/17	545	0.164	229.8	3.093	14.38	88	1022	0
04/17	600	0.082	127.5	4.734	14.31	89.2	1022	0
04/17	615	0.27	127.5	0	14.49	88.9	1022	0
04/17	630	0.116	127.6	0	14.54	90.8	1022	0
04/17	645	0	127.6	0	14.59	93.5	1022	0
04/17	700	0	127.7	0	15.24	95.3	1023	0
04/17	715	0	127.7	0	15.84	95.6	1023	0
04/17	730	0.123	4.624	9.45	16.44	94.1	1023	0
04/17	745	0.326	6.747	8.19	17.24	92.5	1023	0
04/17	800	1.573	16.6	19.65	19.06	81.3	1023	0
04/17	815	1.789	19.81	17.38	19.8	71.9	1023	0
04/17	830	1.388	30	22.37	19.95	68.8	1023	0
04/17	845	1.475	28.99	14.8	20.15	64.5	1023	0
04/17	900	1.506	39.66	15.78	20.53	59.73	1023	0
04/17	915	1.304	27.01	19.75	20.69	55.26	1023	0
04/17	930	1.421	16.12	18.01	21.24	51.55	1023	0
04/17	945	2.125	7.43	25.81	21.89	48.35	1023	0
04/17	1000	1.902	18.14	25.7	21.97	48.03	1023	0
04/17	1015	1.895	33.17	23.3	22.17	47.98	1023	0
04/17	1030	1.539	32.05	20.88	22.33	48.36	1023	0
04/17	1045	1.44	19.22	20.8	22.49	48.49	1023	0
04/17	1100	1.416	7.66	31.11	22.85	48.21	1023	0
04/17	1115	0.849	15.68	51.76	23.22	46.07	1023	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/17	1130	1.405	98.9	38.4	23.28	43.79	1023	0
04/17	1145	0.948	121.5	25.52	23.53	43.75	1023	0
04/17	1200	1.48	118.9	19.24	23.44	44.48	1023	0
04/17	1215	1.692	83.1	20.33	23.26	45.62	1023	0
04/17	1230	1.625	94.9	24.54	23.13	46.08	1023	0
04/17	1245	1.751	113.9	15.23	22.93	44.92	1023	0
04/17	1300	1.427	109.4	21.88	22.91	43.24	1023	0
04/17	1315	0.951	100.6	24.92	22.98	43.38	1022	0
04/17	1330	0.824	132.2	21.63	23.21	43.01	1022	0
04/17	1345	0.576	192.8	34.13	23.43	42.43	1022	0
04/17	1400	0.648	142.1	36.9	24.1	41.14	1022	0
04/17	1415	1.537	120.1	27.22	23.93	40.31	1022	0
04/17	1430	0.745	131.1	38.8	23.89	41.7	1022	0
04/17	1445	1.336	76.9	14.07	23.8	43.07	1022	0
04/17	1500	1.428	78.8	17.46	23.66	44.71	1021	0
04/17	1515	1.9	57.54	14.6	23.56	46.58	1021	0
04/17	1530	1.895	72.3	16.33	23.63	46.95	1021	0
04/17	1545	1.831	82.9	21.62	23.84	46.87	1021	0
04/17	1600	1.962	102.3	17.56	24.11	45.97	1021	0
04/17	1615	1.745	90.6	17.81	24.42	46.06	1021	0
04/17	1630	1.342	84	26.96	24.44	47.29	1021	0
04/17	1645	0.917	112.9	18.22	24.85	46.13	1020	0
04/17	1700	1.298	92.8	28.19	25.29	44.95	1020	0
04/17	1715	1.589	129.8	22.49	24.88	41.3	1020	0
04/17	1730	1.401	140.4	26.95	24.71	39.78	1020	0
04/17	1745	1.082	141.8	29.07	24.65	37.56	1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/17	1800	1.394	134	18.98	24.38	37.3	1020	0
04/17	1815	1.198	141.5	25.71	24.37	36.18	1020	0
04/17	1830	1.192	134.1	21.7	24.18	36.47	1020	0
04/17	1845	1.018	141	20.4	23.82	38.31	1020	0
04/17	1900	0.966	147.3	22.56	23.53	38.42	1020	0
04/17	1915	0.731	155.4	13.17	23.09	39.91	1020	0
04/17	1930	0.752	142.6	16.21	22.3	43.25	1020	0
04/17	1945	0.555	141.8	8.35	21.6	46.23	1020	0
04/17	2000	0.122	156.3	1.442	20.73	49.85	1020	0
04/17	2015	0.034	128.7	0	20.16	52.73	1020	0
04/17	2030	0.027	128.9	0	19.79	55.61	1021	0
04/17	2045	0	130	0	19.77	56.06	1021	0
04/17	2100	0	130.2	0	19.18	57.86	1021	0
04/17	2115	0	129.9	0	18.85	60.55	1021	0
04/17	2130	0.251	171	5.129	18.55	62.34	1021	0
04/17	2145	0.038	171.2	0	18.06	65.49	1021	0
04/17	2200	0	171.4	0	17.61	68.6	1021	0
04/17	2215	0.103	171.5	0	17.14	71.1	1021	0
04/17	2230	0.433	156.4	14.28	17.21	72.9	1021	0
04/17	2245	0.134	125.9	0	17.4	73.4	1021	0
04/17	2300	0.026	135.6	5.781	17.36	74.7	1021	0
04/17	2315	0.412	139.6	0	17.16	76.1	1021	0
04/17	2330	0.436	116.7	14.35	17.28	76.7	1021	0
04/17	2345	0.013	103.4	0.311	17.27	77.2	1020	0
04/18	0	0	105.9	0	16.76	79.3	1021	0
04/18	15	0	106.1	0	16.35	82.4	1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/18	30	0	106	0	16.1	85.3	1020	0
04/18	45	0	106	0	15.83	87.9	1020	0
04/18	100	0	105.7	0	15.62	91	1020	0
04/18	115	0	105.7	0	15.86	91.6	1020	0
04/18	130	0	105.7	0	15.88	92.1	1020	0
04/18	145	0	105.9	0	16.07	93	1020	0
04/18	200	0.215	215.8	7.06	16.26	94.2	1020	0
04/18	215	0.541	218.4	3.889	16.61	93.7	1020	0
04/18	230	0.05	195.3	18.52	16.77	93.3	1020	0
04/18	245	0	178.3	0	16.86	94.2	1020	0
04/18	300	0	178.4	0	16.93	95.2	1020	0
04/18	315	0	178.1	0.137	16.98	96.4	1020	0
04/18	330	0.06	302.3	9.46	16.86	97.1	1020	0
04/18	345	0	303.9	0	16.74	98.1	1020	0
04/18	400	0	303.8	0	16.45	99.2	1020	0
04/18	415	0.235	50.22	5.233	16.26	100.8	1020	0
04/18	430	0.032	51.77	0.234	16.07	101.5	1020	0
04/18	445	0.142	51.41	0.6	16.03	102.3	1019	0
04/18	500	0.16	312.5	4.818	16.36	101.6	1020	0
04/18	515	0.036	312.4	0	16.56	101.2	1020	0
04/18	530	0.124	328.4	5.272	16.53	101.9	1020	0
04/18	545	0.001	331.4	0	16.58	101.7	1020	0
04/18	600	0.074	348.3	5.386	16.62	101.3	1020	0
04/18	615	0	351.3	0	16.8	101.3	1020	0
04/18	630	0.037	109.7	19.4	16.7	101.8	1020	0
04/18	645	0.278	114.9	2.138	16.87	102.8	1020	0

001160.0324

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/18	700	0.551	99.5	10.6	17.04	102.7	1021	0
04/18	715	0.261	66.93	28.93	17.3	102.4	1021	0
04/18	730	0.381	84.5	6.357	17.69	102.3	1021	0
04/18	745	0.244	78.3	11.75	17.97	102.4	1021	0
04/18	800	0.396	58.33	5.927	18.38	102.4	1021	0
04/18	815	0.698	73.9	13.4	19.28	98.7	1021	0
04/18	830	0.957	64.19	12.5	20.19	91.4	1021	0
04/18	845	1.552	64.43	14.2	20.54	90.3	1021	0
04/18	900	1.605	61.57	17.04	20.74	90.8	1021	0
04/18	915	2.164	59.22	15.96	20.97	87.6	1021	0
04/18	930	1.649	72.4	17.03	21.2	84.8	1021	0
04/18	945	2.03	75.6	15.02	21.41	81.7	1021	0
04/18	1000	1.676	66.24	14.54	21.61	81.5	1021	0
04/18	1015	1.847	58.15	16.6	21.87	77	1022	0
04/18	1030	1.888	57.8	17.23	22.14	68.19	1022	0
04/18	1045	2.215	72.3	18.64	22.23	60.9	1022	0
04/18	1100	2.565	76.8	16.37	22.34	60.12	1022	0
04/18	1115	2.471	74.7	17.42	22.62	59.22	1022	0
04/18	1130	2.521	68.16	17.26	22.95	56.02	1022	0
04/18	1145	2.621	83.1	16.46	23.23	51.7	1022	0
04/18	1200	2.5	83.4	22.69	23.78	48.55	1021	0
04/18	1215	3.191	94.3	16.34	23.5	46.03	1021	0
04/18	1230	2.73	93.9	20.03	23.54	47.01	1021	0
04/18	1245	3.238	96.3	20.42	23.82	47.58	1021	0
04/18	1300	3.561	101.5	15.48	24.71	43.83	1021	0
04/18	1315	3.536	82.8	22.59	25.19	40.6	1021	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/18	1330	3.364	95.3	16.79	25.87	38.34	1021	0
04/18	1345	3.163	90.5	21.41	25.16	35.92	1021	0
04/18	1400	3.39	86.6	21.27	25.39	35.93	1020	0
04/18	1415	3.239	96.8	25.04	25.81	34.6	1020	0
04/18	1430	3.55	97.2	17.28	25.47	34.34	1020	0
04/18	1445	3.497	94.8	14.76	25.34	36.06	1020	0
04/18	1500	3.351	90.9	17.67	25.41	36.85	1020	0
04/18	1515	3.562	71.3	16.33	25.55	37.27	1020	0
04/18	1530	3.34	70.5	17.75	25.44	37.38	1020	0
04/18	1545	3.272	85.5	20.79	25.11	38.3	1020	0
04/18	1600	3.192	77.1	17.78	25.13	39.16	1019	0
04/18	1615	2.822	80.5	16.53	25.14	40.64	1019	0
04/18	1630	3.102	67.45	21.2	24.86	41.38	1019	0
04/18	1645	2.909	70.6	14.04	24.61	42.19	1019	0
04/18	1700	2.581	84	17.32	24.47	43.33	1019	0
04/18	1715	2.965	71.7	13	24.38	44.31	1019	0
04/18	1730	2.594	89.7	16.19	24.52	44.54	1019	0
04/18	1745	2.824	78	18.86	24.3	44.97	1019	0
04/18	1800	2.364	90.8	15.19	23.98	45.2	1019	0
04/18	1815	1.822	83.1	16.31	23.74	45.42	1019	0
04/18	1830	1.959	84.6	11.99	23.54	44.67	1019	0
04/18	1845	1.938	77.7	14.9	23.25	46.05	1019	0
04/18	1900	1.859	79.4	14.7	23.07	47.75	1019	0
04/18	1915	1.64	73.2	13.34	22.75	50.66	1019	0
04/18	1930	1.472	65.17	14.41	22.57	52.97	1019	0
04/18	1945	1.76	85.5	14.06	22.36	54.02	1019	0

001160.0326

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/18	2000	1.377	77	13.07	22.16	55.08	1019	0
04/18	2015	0.45	94.4	20.57	21.75	57.5	1019	0
04/18	2030	0.625	118.7	21.52	21.1	61.46	1019	0
04/18	2045	0.19	94.5	7.55	20.71	65.11	1019	0
04/18	2100	0.18	112.3	18.26	20.36	68.95	1020	0
04/18	2115	0.107	160.5	2.636	20.12	71.7	1020	0
04/18	2130	0.353	175.4	5.352	19.73	72.5	1020	0
04/18	2145	0.396	180.7	7.14	19.7	70.3	1020	0
04/18	2200	0.038	181.8	9.73	19.33	71.3	1020	0
04/18	2215	0.039	175.3	0.267	18.75	72.3	1020	0
04/18	2230	0	174.9	0	18.66	74	1020	0
04/18	2245	0	175.3	0	18.5	74.6	1020	0
04/18	2300	0	175.3	0	18.36	76.4	1020	0
04/18	2315	0.106	103	4.963	18.81	76.3	1020	0
04/18	2330	0.018	104.2	0	18.9	75.8	1020	0
04/18	2345	0	103.9	0	18.56	77	1020	0
04/19	0	0	103.6	0	18.25	78.6	1020	0
04/19	15	0	103.4	0	18.11	80.4	1020	0
04/19	30	0.015	25.51	17.61	18.1	82.7	1020	0
04/19	45	0.182	15.35	1.165	18.1	84.5	1020	0
04/19	100	0.097	143.7	7.6	18.36	86.2	1020	0
04/19	115	0	122	33.67	18.39	87.3	1020	0
04/19	130	0.239	322.9	4.904	18.49	88.1	1020	0
04/19	145	0	331.3	4.27	18.43	88.7	1019	0
04/19	200	0	333.6	0	18.33	89.9	1019	0
04/19	215	0.187	337.6	1.857	18.23	90.7	1019	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/19	230	0.44	18.41	4.164	18.14	91.7	1019	0
04/19	245	0.528	30.22	16.1	18.44	91.3	1018	0
04/19	300	0.799	55.31	17.26	19.61	87.9	1019	0
04/19	315	0.373	102.1	13.29	19.48	88.8	1019	0
04/19	330	0.009	115	0.922	18.99	92.2	1019	0
04/19	345	0.065	114.1	4.278	18.6	94.7	1019	0
04/19	400	0.423	80.8	22.28	18.5	97.1	1019	0
04/19	415	0.297	93	9.65	18.51	98.6	1019	0
04/19	430	0.439	49.41	19.98	18.62	98.6	1019	0
04/19	445	0.941	50.5	14.14	19.19	94.1	1019	0
04/19	500	0.695	53.21	11.74	19.32	91.4	1019	0
04/19	515	0.767	41.93	14.93	19.25	90.7	1019	0
04/19	530	0.606	46.62	17.26	19.29	89.5	1019	0
04/19	545	0.728	47.07	14.08	19.13	89.4	1019	0
04/19	600	0.714	46.63	15.97	19.33	87.8	1019	0
04/19	615	0.185	33.57	19.1	19.07	88.7	1019	0
04/19	630	0.767	34.96	14.96	18.63	90.9	1019	0
04/19	645	1.278	31.92	12.28	19.71	85.9	1019	0
04/19	700	1.169	33.26	14.35	20.04	83.7	1020	0
04/19	715	1.39	37.07	12.32	20.12	83.3	1020	0
04/19	730	1.213	46.74	17.03	20.31	82.7	1020	0
04/19	745	1.914	32.01	12.15	20.58	81.6	1020	0
04/19	800	1.624	45.73	19.09	20.91	80.8	1020	0
04/19	815	1.921	46.31	15.4	21.02	80.1	1020	0
04/19	830	2.097	60.26	18.56	21.2	78.7	1020	0
04/19	845	2.245	63.57	12.62	21.32	78.1	1020	0

001160.0328

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/19	900	2.49	56.08	13.27	21.46	78.1	1020	0
04/19	915	2.49	56.35	13.75	21.9	78.5	1020	0
04/19	930	2.666	73.2	17.63	22.64	76.4	1020	0
04/19	945	2.657	61.96	13.08	22.44	76.2	1020	0
04/19	1000	2.685	70.9	16.39	23.1	75.6	1020	0
04/19	1015	2.979	79.1	19.75	23.84	75.4	1020	0
04/19	1030	3.328	94.2	17.67	24.09	76.5	1020	0
04/19	1045	3.645	91.7	17.48	24.33	77.2	1020	0
04/19	1100	3.424	62.61	15.12	24.32	77.7	1020	0
04/19	1115	3.545	80.7	18.05	24.62	76.6	1020	0
04/19	1130	3.042	84.6	21.98	24.97	75.5	1020	0
04/19	1145	3.055	97.2	19.13	24.95	74.2	1019	0
04/19	1200	3.185	89.1	18.19	25.19	74.1	1019	0
04/19	1215	3.525	94.8	16.36	24.95	74.8	1019	0
04/19	1230	3.436	94	16.56	24.92	76	1019	0
04/19	1245	3.578	84.2	23.09	25.94	74.4	1019	0
04/19	1300	3.832	84.8	19.4	25.89	73.7	1018	0
04/19	1315	3.897	90.3	17.33	25.79	73.2	1018	0
04/19	1330	3.833	81.5	16.46	25.95	72.2	1018	0
04/19	1345	3.787	80.1	19.61	26.03	71.8	1018	0
04/19	1400	3.405	74.1	18.24	26.07	71.7	1018	0
04/19	1415	4.043	84.9	14.93	25.9	71.6	1018	0
04/19	1430	3.81	81.2	19.06	25.7	72.5	1018	0
04/19	1445	4.081	89	15.54	25.4	73.4	1018	0
04/19	1500	4.196	86.1	16.97	25.36	74.3	1018	0
04/19	1515	3.937	91.2	19.09	25.48	73.9	1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/19	1530	3.594	108.8	26.54	25.22	73	1018	0
04/19	1545	3.198	124.3	19.01	25.08	73.6	1017	0
04/19	1600	2.707	117.4	18.43	25.04	73.2	1017	0
04/19	1615	3.131	121.8	17	24.73	73.2	1017	0
04/19	1630	2.717	115.1	17.88	24.66	73.2	1017	0
04/19	1645	2.245	138.5	28.59	24.72	73.7	1017	0
04/19	1700	2.827	116.8	19.36	24.7	74.1	1017	0
04/19	1715	2.52	134.5	26.98	24.69	74.1	1017	0
04/19	1730	2.184	129	25.73	24.42	74.9	1017	0
04/19	1745	1.657	133.3	24.67	24.36	75.3	1017	0
04/19	1800	1.68	138.4	26.44	24.24	76.1	1017	0
04/19	1815	2.21	126.1	22.6	23.98	77.7	1017	0
04/19	1830	2.078	126.5	21.98	23.87	79.3	1017	0
04/19	1845	1.519	130.8	27.38	23.83	80.4	1017	0
04/19	1900	1.317	124.3	19.38	23.81	80.8	1017	0
04/19	1915	1.219	122	18.23	23.74	81.1	1017	0
04/19	1930	1.171	119	22.56	23.64	81.4	1017	0
04/19	1945	1.178	111.4	15.63	23.59	82	1018	0
04/19	2000	0.932	121.9	15.41	23.44	83.4	1018	0
04/19	2015	1.696	101.9	15.09	23.46	83.9	1018	0
04/19	2030	1.466	98.6	18.2	23.54	84.2	1018	0
04/19	2045	1.745	87.4	16.39	23.39	85.2	1018	0
04/19	2100	1.585	108.6	15.06	23.23	86.6	1018	0
04/19	2115	0.937	77	17.7	23.07	88.5	1018	0
04/19	2130	1.016	39.76	16.05	22.96	90.4	1018	0
04/19	2145	1.454	42.36	13.74	22.87	91.8	1018	0

001160.0330

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/19	2200	1.1	62.93	12.72	22.8	92.7	1018	0
04/19	2215	1.033	63.98	14.54	22.75	93.2	1018	0
04/19	2230	1.095	38.13	15.12	22.83	93.4	1018	0
04/19	2245	1.165	54.02	10.48	22.78	94	1018	0
04/19	2300	1.423	46.87	11.89	22.84	94.3	1018	0
04/19	2315	1.595	49.74	12.67	22.85	94.5	1018	0
04/19	2330	1.892	47.05	13.39	22.87	94.5	1018	0
04/19	2345	1.711	67.55	14.43	22.75	94.3	1018	0
04/20	0	1.738	91.6	11.84	22.63	94.9	1018	0
04/20	15	0.913	61.35	15.08	22.51	95.2	1017	0
04/20	30	0.978	111.4	25.48	22.5	95.4	1017	0
04/20	45	0.29	212.8	22.42	22.3	96.6	1017	0
04/20	100	0.437	185	37.99	22.11	98	1017	0
04/20	115	0.791	205	36.26	21.93	99.1	1017	0
04/20	130	1.087	210.7	31.52	20.99	98.1	1017	0.01
04/20	145	0.703	194	25.7	20.28	98.6	1017	0
04/20	200	0.617	139.1	38.52	20.1	99.9	1017	0
04/20	215	0.545	218.6	18.37	20.04	100.4	1017	0
04/20	230	0.83	211.6	27.35	19.97	100.5	1016	0
04/20	245	0.314	236.3	23.81	19.94	100.9	1016	0
04/20	300	0.447	226.9	11.96	19.92	101.9	1016	0
04/20	315	0.008	220.2	17.32	19.88	102.4	1016	0
04/20	330	0.527	141.1	17.7	19.87	102	1016	0
04/20	345	0.505	219.8	25.78	19.78	101.9	1016	0.01
04/20	400	0.373	128.3	20.17	19.7	102.3	1016	0
04/20	415	0.597	142.3	7.87	19.61	102.5	1016	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/20	430	0.527	120.3	11.21	19.61	103	1016	0
04/20	445	0.531	88	12.9	19.62	103.4	1016	0.01
04/20	500	0.188	139.5	16.79	19.66	103.7	1016	0
04/20	515	0.088	144.3	7.47	19.61	104.3	1016	0.01
04/20	530	0	130.4	1.43	19.71	104.7	1016	0.01
04/20	545	0.384	147.7	21.86	19.8	105	1016	0.02
04/20	600	0.971	72.3	16.54	20.15	105.1	1016	0.01
04/20	615	0.333	312.7	40.05	20.24	105.1	1017	0.01
04/20	630	0.444	354.9	17.75	20.22	105.3	1017	0
04/20	645	0.755	23.66	26.11	20.38	105.3	1017	0.01
04/20	700	0.653	27.62	28.69	20.46	105.2	1017	0.01
04/20	715	0.712	312.2	15.38	20.51	105.1	1017	0.01
04/20	730	0.706	309.3	8.39	20.52	105.3	1017	0
04/20	745	0.874	341.6	12.26	20.59	105	1017	0.01
04/20	800	0.437	332.2	33.62	20.68	103.8	1017	0
04/20	815	0.642	307.6	19.49	20.82	103.4	1017	0
04/20	830	0.975	351.1	15.62	20.94	101.7	1017	0
04/20	845	1.064	340.8	20.64	21.09	101.3	1017	0
04/20	900	1.407	352.1	14.66	21.27	101.6	1017	0
04/20	915	1.806	354.7	12.9	21.39	101.4	1017	0
04/20	930	1.801	357	13.48	21.48	101.1	1017	0
04/20	945	1.796	352.7	13.65	21.63	100.8	1017	0
04/20	1000	1.984	346.7	12.6	21.79	100.6	1017	0
04/20	1015	2.493	349.1	12.51	21.96	99.7	1017	0
04/20	1030	2.233	352.6	17.48	22.11	99.5	1017	0
04/20	1045	2.365	351.2	17.12	22.23	97.6	1017	0

001160.0332

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/20	1100	2.475	342.1	15.15	22.41	96.2	1017	0
04/20	1115	2.489	339.8	14.18	22.46	95.4	1017	0
04/20	1130	2.484	342.2	16.55	22.43	95.5	1017	0
04/20	1145	2.237	341.2	16.84	22.64	94.2	1017	0
04/20	1200	2.095	329.8	21.79	22.6	93	1017	0
04/20	1215	2.264	348.7	16.21	22.53	91.7	1017	0
04/20	1230	2.049	321.9	14.79	22.66	90.4	1017	0
04/20	1245	2.415	332.4	20.7	22.72	88.5	1017	0
04/20	1300	2.46	334.5	21.65	22.82	88.3	1016	0
04/20	1315	2.818	332.5	18.19	22.78	87.4	1016	0
04/20	1330	2.668	325.6	13.13	22.91	87.2	1016	0
04/20	1345	2.253	320.2	18.67	23.25	85.9	1016	0
04/20	1400	2.247	330.8	15.59	23.59	83.7	1016	0
04/20	1415	2.781	345	20.29	23.89	81.6	1016	0
04/20	1430	3.341	335.4	22.18	24.43	76.8	1015	0
04/20	1445	3.532	337.6	16.55	24.31	75.3	1015	0
04/20	1500	3.528	339	14.67	24.24	75.4	1015	0
04/20	1515	3.309	336.7	17.69	24.29	75.7	1015	0
04/20	1530	3.208	334.4	15.21	24.41	75.6	1015	0
04/20	1545	3.559	344.9	16.49	24.67	75.2	1014	0
04/20	1600	3.286	345.9	17.16	24.75	73.3	1014	0
04/20	1615	3.217	353	18.07	24.99	71.9	1014	0
04/20	1630	3.048	334.7	16	25.17	70.9	1014	0
04/20	1645	2.861	5.761	14.08	25.15	69.99	1014	0
04/20	1700	2.803	356.7	17.61	24.72	71.1	1014	0
04/20	1715	2.739	358.9	24.85	24.62	71	1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/20	1730	2.947	348	19.12	24.43	70.5	1014	0
04/20	1745	3.04	351.3	17.07	24.32	71.3	1014	0
04/20	1800	2.923	17.01	18.95	24.22	70.7	1014	0
04/20	1815	2.489	17.74	18.03	24.23	69.3	1013	0
04/20	1830	2.105	7.17	15.7	23.84	68.66	1014	0
04/20	1845	1.185	352.9	23.62	23.68	68.75	1014	0
04/20	1900	0.842	13.14	49.09	23.62	68.59	1013	0
04/20	1915	0.548	289.7	28.25	23.33	71.6	1014	0
04/20	1930	0.345	284.9	13.2	22.73	74.8	1014	0
04/20	1945	0.766	286.8	9.59	22.19	78.7	1014	0
04/20	2000	0.981	288.4	16.98	21.9	79.5	1014	0
04/20	2015	1.061	313.9	9.5	22	79	1014	0
04/20	2030	0.759	310.2	6.306	21.63	81.7	1014	0
04/20	2045	0.677	292.1	13.03	21.16	86.3	1014	0
04/20	2100	0.164	282.9	0.299	20.75	91.4	1014	0
04/20	2115	0	282.5	0	20.36	95.2	1014	0
04/20	2130	0.322	248.9	15	20.26	97.4	1014	0
04/20	2145	0.005	258.6	0.299	19.96	99.1	1014	0
04/20	2200	0.502	186.3	6.361	19.96	100.7	1014	0
04/20	2215	0.286	151.6	11.38	19.73	101.4	1014	0
04/20	2230	0.434	148.2	11.11	19.69	102.5	1014	0
04/20	2245	0.31	176.8	12.4	19.83	101.8	1014	0
04/20	2300	0.169	157	11.42	19.45	102	1013	0
04/20	2315	0.17	139	7.72	19.19	102.9	1013	0
04/20	2330	0.175	127.5	5.719	19.06	103.5	1013	0
04/20	2345	0.442	144.7	15.05	19.11	104	1013	0

001160.0334

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/21	0	0.067	172.1	24.99	19.06	104.2	1013	0
04/21	15	0.33	190.6	40.39	19.56	104.2	1013	0
04/21	30	0.152	177.5	26.34	19.55	103.3	1013	0
04/21	45	0.125	173.3	29.99	19.43	103.3	1013	0
04/21	100	0.364	142.4	45.09	19.37	103.9	1013	0
04/21	115	0.139	155.1	39.72	19.37	104.1	1013	0
04/21	130	0.069	344.3	8.13	19.18	104.2	1013	0
04/21	145	0.104	345	7.85	19.05	104.6	1013	0
04/21	200	0.164	9.73	19.11	19.06	104.8	1013	0
04/21	215	0.047	24.11	6.157	19.06	105	1013	0
04/21	230	0.016	347.1	6.95	19.12	105.1	1013	0
04/21	245	0.585	322.1	17.92	19.1	105.1	1013	0
04/21	300	0.691	320.8	10.51	19.3	105.2	1013	0
04/21	315	0.528	296.5	14.27	19.39	105.2	1013	0
04/21	330	0.46	293.9	5.812	19.22	105	1013	0
04/21	345	0.359	212.1	8.31	19.2	105.2	1013	0
04/21	400	0.298	220.3	12.8	19.01	105.4	1014	0
04/21	415	0.14	277.3	36.98	18.97	105.5	1014	0
04/21	430	0.222	226.8	24.32	18.99	105.7	1014	0
04/21	445	0.381	298.2	3.437	19.12	105.8	1014	0
04/21	500	0.407	256.9	19.18	19.68	105.8	1014	0
04/21	515	0.716	235.3	14.94	20.06	105.8	1014	0
04/21	530	0.539	256.8	19.41	19.96	105.8	1014	0
04/21	545	0.696	271.1	23.62	20.09	105.9	1014	0
04/21	600	0.593	295.7	8.08	20.28	106	1014	0
04/21	615	0.778	312.3	9.21	20.21	105.8	1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/21	630	0.684	317.9	8.46	20.28	105.8	1014	0
04/21	645	0.847	301.6	6.031	19.98	105.8	1014	0
04/21	700	0.744	305.3	12.82	20.24	105.8	1014	0
04/21	715	0.873	303.9	7.99	20.57	105.7	1014	0
04/21	730	0.849	294	11.52	21.36	105	1015	0
04/21	745	0.875	309	9.66	21.68	103.3	1015	0
04/21	800	1.148	306.2	15.65	22.01	102	1015	0
04/21	815	1.269	308.8	16.42	22.32	100.3	1015	0
04/21	830	0.963	283.2	25.43	22.44	99	1015	0
04/21	845	1.24	305.7	18.81	22.72	97.9	1015	0
04/21	900	1.501	303	18.76	23.1	94.9	1015	0
04/21	915	1.844	301.5	25.69	23.43	91	1015	0
04/21	930	2.268	327.8	14.94	23.49	87.7	1015	0
04/21	945	1.723	311.3	22.17	23.97	82.2	1015	0
04/21	1000	1.793	294.1	15.6	24.56	76.1	1015	0
04/21	1015	1.966	305.8	16.66	24.33	74.6	1015	0
04/21	1030	2.175	322.2	18.5	24.69	72.5	1015	0
04/21	1045	2.529	328.5	21.33	24.87	69.68	1015	0
04/21	1100	2.075	308.9	17.7	25.42	65.85	1015	0
04/21	1115	1.506	321.4	21.94	25.97	61.61	1015	0
04/21	1130	1.697	329.5	22.89	26.39	56.91	1015	0
04/21	1145	2.121	327.4	22.1	26.33	55.54	1015	0
04/21	1200	2.507	342.3	23.03	26.47	53.46	1015	0
04/21	1215	2.416	342.8	28.02	26.62	52.54	1014	0
04/21	1230	2.219	333.7	24.09	27.14	51.69	1014	0
04/21	1245	2.858	322.2	12.93	26.49	51.38	1014	0

001160.0336

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/21	1300	2.359	312.5	19.85	26.6	52.14	1014	0
04/21	1315	2.23	337.4	15.59	26.51	53.86	1014	0
04/21	1330	1.994	343.8	23.22	26.75	53.63	1014	0
04/21	1345	1.802	326	26.23	26.77	51.84	1014	0
04/21	1400	1.889	319.2	26.11	26.61	51.49	1014	0
04/21	1415	1.819	303.3	21.26	26.72	51.1	1013	0
04/21	1430	1.265	308.2	40.15	27.04	51.17	1013	0
04/21	1445	1.326	280.6	43.13	27.79	49.58	1013	0
04/21	1500	1.223	303.9	48.33	28.23	48.37	1013	0
04/21	1515	1.574	332.9	28.59	27.95	48.05	1013	0
04/21	1530	0.835	303.8	41.76	28.37	47.07	1012	0
04/21	1545	1.489	348.4	41.84	28.34	47.94	1012	0
04/21	1600	2.292	347.1	29.29	28.42	47.81	1012	0
04/21	1615	2.307	349.1	18.53	27.44	48.35	1012	0
04/21	1630	1.918	331.6	19.08	27.36	49.16	1012	0
04/21	1645	1.871	313.3	18.76	27.14	49.83	1012	0
04/21	1700	1.546	317.5	19.76	27.12	50.65	1012	0
04/21	1715	1.612	320.4	16.62	27.07	50.82	1011	0
04/21	1730	1.407	303.3	16.17	27.2	51.22	1011	0
04/21	1745	1.621	313.7	17.15	26.81	51.79	1011	0
04/21	1800	1.235	316.3	13.58	26.7	52.05	1011	0
04/21	1815	1.573	311.5	11	26.63	52.86	1011	0
04/21	1830	1.889	314	12.54	26.32	53.8	1011	0
04/21	1845	1.122	309.7	15.1	26.12	54.4	1011	0
04/21	1900	1.518	316	15.21	25.97	55.84	1011	0
04/21	1915	1.401	314.2	12.66	25.55	58.44	1011	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/21	1930	1.318	314.2	7.82	25.3	59.75	1012	0
04/21	1945	1.319	314.2	11.22	25.21	59.46	1012	0
04/21	2000	1.421	325.4	11.8	24.99	58.71	1012	0
04/21	2015	0.955	310.1	8.88	24.86	58.2	1012	0
04/21	2030	0.669	304.9	9.84	24.53	59.26	1012	0
04/21	2045	1.199	311.9	9.32	24.39	59.34	1012	0
04/21	2100	1.455	319.8	12.09	24.51	58.42	1012	0
04/21	2115	2.393	325	13.19	24.47	63.12	1013	0
04/21	2130	2.869	325.5	15.33	24.05	70.8	1013	0
04/21	2145	2.199	317.8	16.29	23.67	68.03	1013	0
04/21	2200	1.98	317.4	15.4	23.48	68.16	1013	0
04/21	2215	1.557	316.1	13.05	23.37	70	1013	0
04/21	2230	1.737	297.2	12.89	23.25	72.4	1013	0
04/21	2245	1.651	320.3	12.11	23.24	74.7	1013	0
04/21	2300	1.911	311.2	14.79	23.27	75.6	1013	0
04/21	2315	2.175	310.9	16.29	23.24	76.5	1013	0
04/21	2330	2.259	312.1	15.2	23.13	77.2	1013	0
04/21	2345	2.121	311.5	15.73	22.9	76.3	1013	0
04/22	0	1.94	307.8	17.34	22.74	76.8	1013	0
04/22	15	1.452	310.5	14.7	22.63	77.7	1014	0
04/22	30	1.323	297.5	10.35	22.62	78.6	1014	0
04/22	45	0.759	292.1	31.4	22.49	80	1014	0
04/22	100	0.646	303.6	19.32	21.98	82.7	1013	0
04/22	115	0.796	307	11.3	21.71	85.6	1013	0
04/22	130	0.91	314.3	10.69	21.91	86.5	1013	0
04/22	145	0.818	303.1	10.39	21.99	86.8	1013	0

001160.0338

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/22	200	0.722	292.7	20.99	21.86	88.4	1013	0
04/22	215	1.588	357.3	13.6	22.44	87.9	1013	0
04/22	230	1.484	9.53	15.01	22.62	83.8	1013	0
04/22	245	1.533	347.1	14.23	22.5	79.4	1013	0
04/22	300	1.434	354.6	15.39	22.43	79.7	1013	0
04/22	315	1.62	357.1	13.96	22.36	77.6	1013	0
04/22	330	1.815	356.7	11.72	22.22	76.1	1013	0
04/22	345	1.109	10.79	17.56	22.17	74.6	1013	0
04/22	400	1.002	38.44	20.81	22.1	74.4	1013	0
04/22	415	0.353	23.94	34.4	21.78	76.4	1013	0
04/22	430	0.234	328.6	15.44	21.16	81.1	1013	0
04/22	445	0.678	358	17.12	20.97	82.5	1013	0
04/22	500	0.686	315.5	16.98	21.19	81.5	1013	0
04/22	515	0.723	345.7	23.01	20.74	83.5	1013	0
04/22	530	1.118	3.819	16.89	21.24	80.6	1013	0
04/22	545	0.932	20.45	15.66	21.48	78.3	1013	0
04/22	600	0.831	36.05	15.24	21.49	77.8	1014	0
04/22	615	1	32.36	15.66	21.57	77.2	1014	0
04/22	630	1.145	34.02	11.06	21.47	77.4	1014	0
04/22	645	1.712	32.68	12.47	21.49	77.3	1014	0
04/22	700	1.557	52.45	14.93	21.31	78	1014	0
04/22	715	1.586	42.62	12.22	21.13	79.4	1014	0
04/22	730	1.396	53.29	11.88	21.2	80.4	1014	0
04/22	745	1.752	69.88	15.76	21.29	81.2	1015	0
04/22	800	1.943	68.92	13.41	21.4	80.9	1015	0
04/22	815	2.23	52.52	16.08	21.6	80.3	1015	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/22	830	1.944	60.18	18.67	22.06	79.1	1015	0
04/22	845	1.918	74.3	18.27	22.19	78.7	1015	0
04/22	900	1.824	74.5	24.51	22.48	77.9	1016	0
04/22	915	2.055	51.92	16.14	22.79	76.2	1016	0
04/22	930	2.278	52.95	21.76	22.91	75.3	1016	0
04/22	945	2.123	65.95	19.98	23.19	74.1	1016	0
04/22	1000	1.741	67.95	20.74	23.24	73.5	1016	0
04/22	1015	2.038	61.68	20.75	23.04	73.7	1016	0
04/22	1030	2.011	66.84	26.18	23.18	73.9	1016	0
04/22	1045	1.31	74.7	28.65	23.69	73.3	1016	0
04/22	1100	2.076	118	16.1	23.9	72.1	1016	0
04/22	1115	2.209	88.2	23.83	24.64	70.1	1016	0
04/22	1130	2.489	105.1	20.44	25.38	67.64	1016	0
04/22	1145	2.567	101.4	22.16	25.68	65.76	1016	0
04/22	1200	2.399	118.4	18.57	26.21	64.27	1016	0
04/22	1215	2.937	107.2	16.92	26.01	64.42	1016	0
04/22	1230	2.709	103.4	16.88	26.07	65.14	1016	0
04/22	1245	2.671	57.13	18.77	26.58	62.93	1016	0
04/22	1300	2.586	87.3	24.98	26.77	62.44	1016	0
04/22	1315	2.85	54.34	19.31	27.02	60.86	1015	0
04/22	1330	3.256	102	17.84	27.09	60.44	1015	0
04/22	1345	2.994	85.2	19.1	27.13	59.85	1015	0
04/22	1400	3.073	90.9	17.85	27.3	58.33	1015	0
04/22	1415	3.569	98.2	23.03	27.33	58.28	1015	0
04/22	1430	3.416	100.8	20.76	27.46	58.42	1015	0
04/22	1445	3.527	90.8	15.3	27.29	59.63	1015	0

001160.0340

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/22	2130	1.633	127.4	17.86	22.65	84.4	1016	0
04/22	2145	1.517	133.8	21.27	22.55	84.7	1016	0
04/22	2200	1.273	134.1	25.46	22.36	85.1	1016	0
04/22	2215	1.085	137.2	15.9	22.21	85.3	1016	0
04/22	2230	0.761	145.5	26.78	22.08	85.9	1016	0
04/22	2245	0.875	137.5	17.5	21.94	87.1	1016	0
04/22	2300	0.739	129.9	12.67	21.67	88.9	1016	0
04/22	2315	1.07	132.4	19.61	21.56	91.1	1016	0
04/22	2330	1.336	118.7	19.82	21.7	91.9	1016	0
04/22	2345	1.495	108.8	13.87	21.81	92	1016	0
04/23	0	1.256	101.5	17.16	21.74	92.6	1016	0
04/23	15	1.891	101.6	16.96	21.81	93	1016	0
04/23	30	2.083	109.5	15.44	21.95	92.7	1016	0
04/23	45	3.112	108.9	14.47	22.08	88.9	1016	0
04/23	100	2.729	109.6	18.64	21.85	88.5	1015	0
04/23	115	2.66	104.7	16.41	21.81	88.3	1015	0
04/23	130	2.462	107.9	17.5	21.71	88	1015	0
04/23	145	2.25	111.1	16.96	21.61	88.3	1015	0
04/23	200	2.782	115.2	14.12	21.68	87.5	1015	0
04/23	215	2.113	113.3	16.1	21.62	86.7	1015	0
04/23	230	1.594	111.5	17.26	21.4	87.6	1015	0
04/23	245	1.547	100.4	18.36	21.2	88.9	1014	0
04/23	300	2.219	98.5	14.9	21.33	89	1014	0
04/23	315	2.161	106.4	17.1	21.31	89.1	1014	0
04/23	330	1.874	111.8	16.18	21.26	89.8	1015	0
04/23	345	2.015	109.2	17.15	21.37	90.1	1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/23	400	2.129	109.2	15.85	21.45	90.2	1015	0
04/23	415	2.423	111.4	17.44	21.59	89.8	1014	0
04/23	430	2.374	106	16.14	21.67	89.3	1014	0
04/23	445	1.94	113.2	13.08	21.57	89.9	1015	0
04/23	500	1.653	102.1	14.53	21.46	91	1015	0
04/23	515	1.589	106.8	15.55	21.4	91.9	1015	0
04/23	530	1.494	105.4	15.67	21.39	92.4	1015	0
04/23	545	1.381	115.4	18.13	21.34	92.9	1015	0
04/23	600	1.455	100.4	14.64	21.46	92.8	1015	0
04/23	615	1.083	103.3	16.67	21.43	93.3	1015	0
04/23	630	1.763	96.1	15.96	21.66	93.3	1015	0
04/23	645	2.08	105.8	17.86	22.03	91.2	1016	0
04/23	700	1.959	116.5	17.06	22.04	90.3	1016	0
04/23	715	2.211	105.7	15.38	22.28	89.2	1016	0
04/23	730	1.99	104.6	16.1	22.55	88.1	1016	0
04/23	745	2.137	109.1	17.07	22.66	87.9	1016	0
04/23	800	2.44	102.3	12.95	22.76	87.9	1016	0
04/23	815	2.874	100.4	15.39	22.99	87	1016	0
04/23	830	3.023	105.5	16.97	23.44	86.7	1016	0
04/23	845	2.779	92.4	19.22	23.9	84.7	1016	0
04/23	900	3.391	99.9	18.03	24	83.2	1017	0
04/23	915	2.917	95.8	15.87	23.99	82.5	1017	0
04/23	930	2.848	97	14.8	24.11	81.3	1017	0
04/23	945	3.23	105.8	17.89	24.33	79.2	1017	0
04/23	1000	3.004	104.1	14.56	24.41	78.4	1017	0
04/23	1015	3.149	106.2	18.29	24.33	78	1017	0

001160.0342

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/23	1030	3.651	99	15.55	24.41	77.5	1017	0
04/23	1045	3.202	93.7	14.4	24.85	76.4	1017	0
04/23	1100	3.748	87.4	17.92	24.61	76	1017	0
04/23	1115	3.704	100.1	19.15	24.54	76.5	1017	0
04/23	1130	3.969	85.7	18.02	24.03	78.2	1017	0
04/23	1145	3.739	81.4	18.29	24.27	78.4	1017	0
04/23	1200	4.311	85.9	19	25.22	75.7	1017	0
04/23	1215	4.372	94.3	17	25.44	74.5	1017	0
04/23	1230	4.966	92	14.16	25.08	74.5	1017	0
04/23	1245	4.663	89.8	18.43	25.22	74.4	1017	0
04/23	1300	4.915	96.2	18.13	25.32	73.7	1017	0
04/23	1315	4.413	88.4	19.21	25.52	73.1	1017	0
04/23	1330	4.285	87.4	17.79	25.22	73.1	1017	0
04/23	1345	4.594	84.2	15.21	25.3	72.4	1016	0
04/23	1400	5.002	88.4	16.17	25.1	72.6	1016	0
04/23	1415	4.654	91.6	17.57	25.21	72.5	1016	0
04/23	1430	4.485	87.4	15.88	25.46	72.4	1016	0
04/23	1445	4.36	96.9	16.61	25.21	73.1	1016	0
04/23	1500	4.641	96.4	15.07	25.16	72.4	1016	0
04/23	1515	4.153	93.7	18.58	24.91	72.9	1016	0
04/23	1530	4.236	93.8	16.17	24.8	73.1	1016	0
04/23	1545	3.883	95.8	18.64	24.61	74.3	1015	0
04/23	1600	4.163	103.1	14.66	24.47	75	1015	0
04/23	1615	4.072	89.2	15.76	24.32	76.1	1015	0
04/23	1630	3.479	88.1	18.21	24.16	77	1015	0
04/23	1645	3.688	96.7	16.11	24.18	76.4	1015	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/23	1700	3.329	101.5	16.63	24.89	74.5	1015	0
04/23	1715	3.734	92.5	13.52	24.91	74.1	1015	0
04/23	1730	4.158	93.7	16.05	24.49	75.7	1015	0
04/23	1745	3.503	95	15.44	24.45	76.2	1015	0
04/23	1800	3.41	99.8	14.29	24.4	76.1	1015	0
04/23	1815	3.599	99.6	15.96	24.31	76.4	1015	0
04/23	1830	3.148	106.7	14.69	24.32	76.4	1015	0
04/23	1845	3.173	117.6	17.59	24	76.6	1015	0
04/23	1900	3.135	110.3	16.66	23.95	76.8	1015	0
04/23	1915	2.988	117.8	17.91	23.79	77.2	1015	0
04/23	1930	2.866	118	18.05	23.69	78.1	1014	0
04/23	1945	2.613	109.9	16	23.61	79.3	1014	0
04/23	2000	2.156	114.1	16.89	23.42	80.5	1014	0
04/23	2015	2.574	103.3	13.6	23.15	82	1014	0
04/23	2030	2.433	101.3	14.02	22.92	83.7	1014	0
04/23	2045	2.287	98.1	16.08	22.83	85.1	1014	0
04/23	2100	2.178	103.8	14.84	22.78	86.3	1015	0
04/23	2115	1.886	112.4	14.08	22.78	87.2	1015	0
04/23	2130	1.621	94.9	13.91	22.73	87.8	1015	0
04/23	2145	1.679	101.4	16.74	22.66	88.8	1015	0
04/23	2200	1.795	107.7	13.33	22.6	89.6	1015	0
04/23	2215	1.854	111.3	15.96	22.44	90.8	1015	0
04/23	2230	1.518	107.7	17.27	22.38	91.4	1015	0
04/23	2245	1.33	99.6	16.44	22.26	92	1015	0
04/23	2300	1.185	110	16.12	22.23	92.3	1015	0
04/23	2315	1.375	117.7	15.94	22.21	92.9	1015	0

001160.0344

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/23	2330	1.511	113.4	13.22	22.18	93.2	1015	0
04/23	2345	1.47	106.1	17.92	22.11	94	1015	0
04/24	0	1.386	116.4	15.68	22.19	94	1015	0
04/24	15	1.548	122.1	18.27	22.32	93.5	1015	0
04/24	30	1.374	119.8	14.96	22.38	93.3	1015	0
04/24	45	0.999	138.1	22.66	22.17	94	1015	0
04/24	100	0.58	142	25.37	21.82	95.3	1015	0
04/24	115	0.32	131.3	29.16	21.42	96.8	1015	0
04/24	130	0.708	123	15.53	21.14	98.6	1014	0
04/24	145	0.562	143.3	20.74	21.1	100	1014	0
04/24	200	0.583	133.4	12.72	20.97	101.1	1014	0
04/24	215	0.633	127.7	13.32	20.93	102	1014	0
04/24	230	0.445	144	17.14	20.81	102.5	1014	0
04/24	245	0.512	117.8	23.69	20.76	103.1	1013	0
04/24	300	0.484	110.5	19.95	20.61	103.5	1013	0
04/24	315	0.952	117	11.72	20.7	103.9	1013	0
04/24	330	0.803	119.9	15.64	20.88	103.7	1013	0
04/24	345	0.883	122.6	20.94	21.02	103.4	1013	0
04/24	400	1.082	127.1	17.55	21.24	103.3	1013	0
04/24	415	1.043	120.4	16.99	21.52	102.6	1013	0
04/24	430	1.062	114.8	15.72	21.51	102.1	1013	0
04/24	445	0.816	140	19.85	21.41	102.6	1013	0
04/24	500	1.032	135.8	21.43	21.44	103.1	1013	0
04/24	515	0.579	146	21.62	21.54	103	1013	0
04/24	530	0.601	130.7	17.8	21.31	103.3	1013	0
04/24	545	0.452	143.7	14.97	21.13	103.8	1013	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/24	600	0.419	130.6	17.61	20.98	104.3	1013	0
04/24	615	0.52	125.2	11.26	20.83	104.7	1013	0
04/24	630	0.739	128.7	19.28	21.06	105	1013	0
04/24	645	0.786	118	15.18	21.22	105	1013	0
04/24	700	0.342	115.9	16.88	21.28	104.9	1014	0
04/24	715	0.874	120.8	15.31	21.59	104.6	1014	0
04/24	730	1.24	130	23.14	22.46	102.5	1014	0
04/24	745	1.53	133.2	21.87	22.64	100.9	1014	0
04/24	800	1.47	130.1	24.09	22.78	100.5	1014	0
04/24	815	1.479	133.5	30.34	23.42	98.4	1014	0
04/24	830	1.654	132.8	26.5	23.61	97.2	1014	0
04/24	845	1.475	151.8	35.01	24.2	94.7	1014	0
04/24	900	1.68	133.8	28.52	24.86	89.6	1014	0
04/24	915	1.64	133.5	30.36	25.06	85.5	1014	0
04/24	930	1.657	160.2	32.91	25.22	81.9	1014	0
04/24	945	0.959	164.6	45.35	25.21	80.5	1014	0
04/24	1000	0.819	157.6	39.38	25.15	79.6	1014	0
04/24	1015	0.813	156.7	36.58	24.96	77.9	1014	0
04/24	1030	1.446	203.1	35.91	26.22	75	1014	0
04/24	1045	1.17	187.7	43.82	26.43	70.7	1014	0
04/24	1100	1.264	186.6	43.77	26.92	68.8	1014	0
04/24	1115	1.19	160.2	42.78	27.6	66.23	1014	0
04/24	1130	1.583	164.7	40.23	27.59	63.9	1014	0
04/24	1145	1.499	173	48.72	27.42	63.54	1014	0
04/24	1200	1.95	146	37.64	27.62	63.08	1014	0
04/24	1215	1.735	158.9	34.68	27.7	63.34	1014	0

001160.0346

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/24	1230	1.562	193.9	41.9	27.17	63.73	1014	0
04/24	1245	1.461	168.9	42.29	28.66	60.83	1013	0
04/24	1300	2.068	146	35.32	27.86	60.74	1013	0
04/24	1315	1.81	156.3	33.44	27.22	62.87	1013	0
04/24	1330	1.601	169.4	43.16	27.69	63.51	1013	0
04/24	1345	2.212	143.9	42.13	28.29	61.3	1013	0
04/24	1400	1.79	161	45.97	28.95	59.91	1013	0
04/24	1415	2.066	168	41.79	28.81	58.67	1013	0
04/24	1430	1.998	144	37.6	28.55	58.95	1013	0
04/24	1445	1.981	140.9	33.86	28.71	59.62	1013	0
04/24	1500	2.618	138.7	30.69	28.58	59.35	1012	0
04/24	1515	2.413	145	28.89	28.05	59.95	1012	0
04/24	1530	2.449	157	36.24	28.51	58.85	1012	0
04/24	1545	2.07	159.4	35.89	28.36	58.95	1012	0
04/24	1600	1.522	159.3	41.19	28.26	58.9	1012	0
04/24	1615	1.825	162.1	44.26	28.44	59.3	1012	0
04/24	1630	2.231	141.8	35.15	28.7	58.81	1012	0
04/24	1645	1.873	153.1	43.02	28.51	59.7	1012	0
04/24	1700	2.346	155.5	34.14	28.07	61.3	1012	0
04/24	1715	2.024	148.6	36.48	28.03	61.92	1011	0
04/24	1730	2.459	133.8	27.96	27.83	61.73	1011	0
04/24	1745	2.274	136.5	27.34	27.53	61.88	1011	0
04/24	1800	1.816	129.9	24.19	27.5	61.76	1011	0
04/24	1815	2.285	148.4	37.7	27.16	61.65	1011	0
04/24	1830	1.981	139.3	32.36	27.23	62.26	1011	0
04/24	1845	2.863	128.4	23.79	26.75	63.12	1011	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/24	1900	2.319	129.4	29.11	26.45	64.02	1011	0
04/24	1915	2.172	128.4	24.02	26.13	66.09	1011	0
04/24	1930	1.916	139.8	25.58	25.87	67.56	1012	0
04/24	1945	1.41	143.6	37.47	25.57	68.94	1012	0
04/24	2000	1.437	140.4	39.33	25.29	70.6	1012	0
04/24	2015	1.474	144.6	32.33	25.04	72.6	1012	0
04/24	2030	1.502	145.8	33.42	24.9	74.5	1012	0
04/24	2045	1.765	128.5	23.51	24.78	75.9	1012	0
04/24	2100	1.637	131	22.54	24.57	77.7	1012	0
04/24	2115	1.445	126.8	23.78	24.43	79.7	1012	0
04/24	2130	1.358	131.8	29.29	24.26	81.9	1013	0
04/24	2145	1.844	129.2	20.39	24.24	83.7	1013	0
04/24	2200	2.285	132.5	23.69	24.2	86.8	1013	0
04/24	2215	1.846	130.3	22.38	24.21	88.7	1013	0
04/24	2230	1.809	131.3	23.64	24.17	90.5	1013	0
04/24	2245	1.958	127.6	21.86	24.1	91.9	1013	0
04/24	2300	1.544	137.2	22.32	24.01	92.5	1013	0
04/24	2315	1.74	140.4	28.52	23.96	92.9	1013	0
04/24	2330	1.661	133.4	25.38	23.9	93.7	1013	0
04/24	2345	1.624	129.7	24.06	23.82	94.8	1013	0
04/25	0	2.162	123.8	16.52	23.81	95.7	1012	0
04/25	15	2.019	123.4	21.66	23.8	96.5	1012	0
04/25	30	1.591	132.2	21.43	23.82	97.2	1012	0
04/25	45	1.839	126.8	24.87	23.97	97.1	1012	0
04/25	100	1.226	131.2	21.49	23.96	97.3	1013	0
04/25	115	1.263	134.1	25.9	23.93	97.9	1013	0

001160.0348

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/25	130	0.758	133.8	19.65	23.78	98.5	1013	0
04/25	145	1.646	124	17.7	23.83	98.7	1013	0
04/25	200	1.368	131.3	20.71	23.87	98.5	1012	0
04/25	215	1.059	133.6	27.38	23.84	98.5	1013	0
04/25	230	1.125	136.6	24.44	23.86	98.6	1012	0
04/25	245	1.169	129.4	17.56	23.78	99	1012	0
04/25	300	1.37	128.8	20.05	23.67	99.8	1012	0
04/25	315	1.416	130.6	19.78	23.6	100.4	1012	0
04/25	330	1.433	126.3	18.34	23.57	100.9	1012	0
04/25	345	1.132	126.5	20.03	23.54	101.2	1012	0
04/25	400	0.486	152.6	27.08	23.5	101.5	1013	0
04/25	415	0.656	142.2	18.66	23.55	101.8	1013	0
04/25	430	0.645	137.6	21.36	23.78	101.1	1013	0
04/25	445	0.728	136.7	17.34	23.88	100.6	1013	0
04/25	500	1.117	128.1	22.37	24.05	99.6	1013	0
04/25	515	1.254	127.6	20.27	23.97	99.7	1013	0
04/25	530	1.068	134	22.84	23.88	100	1013	0
04/25	545	1.136	127.2	14.29	23.71	100.6	1013	0
04/25	600	0.63	136.4	20.38	23.6	101	1013	0
04/25	615	0.495	137	19.01	23.38	101.6	1013	0
04/25	630	0.358	95.6	13.13	23.11	102.4	1013	0
04/25	645	0.251	90.9	8.16	22.9	102.9	1014	0
04/25	700	0.594	73.3	9.48	23.1	103.4	1014	0
04/25	715	0.329	132.4	30.27	23.44	103.6	1014	0
04/25	730	0.953	127.8	16.96	23.9	102.6	1014	0
04/25	745	1.68	125.5	19.78	24.39	100.5	1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/25	800	1.878	128.3	21.29	24.8	98.5	1014	0
04/25	815	1.835	139.2	22.33	25.26	95.9	1014	0
04/25	830	1.404	138.4	37.08	25.43	94	1014	0
04/25	845	1.5	153.2	41.92	25.85	91.3	1014	0
04/25	900	1.665	145.7	37.15	26.06	88.7	1014	0
04/25	915	1.403	155.1	36.82	26.1	87	1014	0
04/25	930	1.99	145.4	38.83	26.62	82.8	1015	0
04/25	945	1.737	154	36.64	27.16	79.7	1015	0
04/25	1000	0.922	178.9	46.66	27.3	77.3	1015	0
04/25	1015	1.766	165.5	39.75	27.49	76	1015	0
04/25	1030	1.416	149.3	42.01	27.68	74.6	1015	0
04/25	1045	1.716	132	34.98	28	73.2	1015	0
04/25	1100	1.483	148.3	39.03	27.83	72.6	1015	0
04/25	1115	1.761	143.5	33.26	28.27	70.4	1015	0
04/25	1130	2.372	127.5	27.5	28.37	67.81	1015	0
04/25	1145	2.338	137.9	35.6	28.84	65.59	1015	0
04/25	1200	2.914	125.4	24.15	28.73	65.63	1015	0
04/25	1215	2.53	127.1	25.49	29	64.68	1014	0
04/25	1230	2.251	145.5	35.38	29.3	63.83	1014	0
04/25	1245	2.523	134.2	32.64	29.33	61.82	1014	0
04/25	1300	2.554	132	30.02	29.03	61.65	1014	0
04/25	1315	2.313	139.9	30.76	29.12	60.18	1014	0
04/25	1330	1.831	157	33.22	29.27	59.72	1015	0
04/25	1345	1.617	161.4	39.38	29.55	58.2	1015	0
04/25	1400	1.872	151.7	45.05	29.58	58.19	1015	0
04/25	1415	1.755	158.1	37.79	29.76	57.09	1014	0

001160.0350

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/25	1430	1.776	144.5	39.19	29.59	57.59	1014	0
04/25	1445	2.131	133.4	35.06	29.37	57.66	1015	0
04/25	1500	2.097	139.4	31	28.91	57.63	1014	0
04/25	1515	2.788	131.4	24.1	29.27	58.42	1014	0
04/25	1530	2.336	132.6	28.92	28.9	59.29	1014	0
04/25	1545	2.563	132.8	30.62	28.99	59.4	1014	0
04/25	1600	2.486	132.8	29.37	28.94	59.85	1014	0
04/25	1615	2.825	136.1	30.32	29.22	58.71	1014	0
04/25	1630	2.389	141.4	34.06	29.29	58.85	1014	0
04/25	1645	2.332	130.7	29.58	29.11	59.67	1014	0
04/25	1700	2.104	127.2	25.65	28.57	60.77	1014	0
04/25	1715	2.492	132.1	29.55	28.65	61.73	1014	0
04/25	1730	3.055	132.1	28.82	28.61	61.44	1014	0
04/25	1745	3.329	127.3	26.36	28.18	62.68	1014	0
04/25	1800	2.754	131.7	25.33	27.97	63.61	1014	0
04/25	1815	3.123	122.9	17.33	27.32	69.6	1014	0
04/25	1830	2.814	119.8	18.67	27.03	73.8	1014	0
04/25	1845	2.376	127.9	23	26.76	75.9	1014	0
04/25	1900	2.383	128.6	23.47	26.44	77.8	1014	0
04/25	1915	2.457	127.8	20.26	26.19	79.5	1014	0
04/25	1930	2.981	126.1	20.26	25.96	80.9	1014	0
04/25	1945	2.719	121.7	18.92	25.77	82.4	1014	0
04/25	2000	2.829	121.6	16.84	25.66	83.5	1014	0
04/25	2015	3.27	123.6	24.08	25.63	84.1	1014	0
04/25	2030	2.927	121.3	16.81	25.59	84.4	1014	0
04/25	2045	2.944	116.5	14.5	25.36	85.7	1015	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/25	2100	2.765	128.3	19.48	25.16	87.2	1015	0
04/25	2115	2.643	127.1	18.14	24.99	88.7	1015	0
04/25	2130	1.863	128.7	18.77	24.87	89.9	1015	0
04/25	2145	2.339	128.2	23.28	24.84	90.5	1015	0
04/25	2200	2.221	129	25.53	24.78	90.9	1015	0
04/25	2215	1.957	133.1	22.74	24.67	92.2	1015	0
04/25	2230	1.947	127.4	21.04	24.6	93.5	1015	0
04/25	2245	1.87	129.1	18.61	24.55	94.2	1015	0
04/25	2300	1.587	132.6	21.38	24.43	95.2	1015	0
04/25	2315	1.446	128.6	21.19	24.31	96.2	1015	0
04/25	2330	1.537	128	21.54	24.3	97	1015	0
04/25	2345	1.616	130.7	20.03	24.31	97.6	1015	0
04/26	0	1.312	133.2	21.63	24.29	98.1	1015	0
04/26	15	1.738	130.2	19.17	24.29	98.4	1015	0
04/26	30	1.997	124.5	19.07	24.37	98.3	1015	0
04/26	45	2.257	128.4	20.09	24.37	98.1	1015	0
04/26	100	2.032	124.9	19.36	24.38	97.5	1015	0
04/26	115	2.21	124.2	16.16	24.34	97.7	1015	0
04/26	130	2.377	129.2	17.91	24.3	98	1016	0
04/26	145	1.994	128.5	25.22	24.29	98.2	1015	0
04/26	200	1.812	126.6	22.84	24.19	98.5	1015	0
04/26	215	1.667	127.8	25.17	24.07	98.9	1015	0
04/26	230	1.97	124.3	18.11	24.02	98.8	1015	0
04/26	245	1.632	120.9	18.67	24.05	98.6	1015	0
04/26	300	1.811	128.6	23.53	24.03	98.9	1015	0
04/26	315	1.734	130.3	19.65	23.88	99.3	1015	0

001160.0352

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/26	330	1.643	131	24.34	23.73	99.8	1015	0
04/26	345	1.702	128.7	16.42	23.58	100.2	1015	0
04/26	400	1.402	131.7	19.34	23.46	100.9	1015	0
04/26	415	1.272	123.1	20.5	23.36	101.4	1015	0
04/26	430	1.419	126.7	18.37	23.29	101.9	1015	0
04/26	445	1.133	127.7	17.85	23.23	102.2	1015	0
04/26	500	0.783	123.9	25.42	23.15	102.5	1016	0
04/26	515	1.376	114.2	13.42	23.25	102.3	1016	0
04/26	530	1.069	109.1	18.23	23.28	101.7	1016	0
04/26	545	0.766	102.3	14.36	23.19	101.8	1016	0
04/26	600	1.198	99.5	9.89	23.07	101.8	1016	0
04/26	615	0.701	98	16.98	22.91	101.9	1016	0
04/26	630	0.614	82.2	9.39	22.77	102.4	1016	0
04/26	645	1.257	90.7	8.89	22.83	102.8	1016	0
04/26	700	1.704	102.8	14.66	23.22	101.7	1017	0
04/26	715	1.726	103	13.27	23.43	101	1017	0
04/26	730	1.809	108.1	14.18	23.78	99.6	1017	0
04/26	745	1.663	110.3	17.62	24.31	97.3	1017	0
04/26	800	1.875	107.7	19.18	24.77	94.6	1017	0
04/26	815	1.99	114	18.89	25.09	92.5	1017	0
04/26	830	1.716	128.7	22.82	25.1	90.2	1017	0
04/26	845	1.889	125.6	23.61	25.26	88.5	1018	0
04/26	900	1.75	132.9	23.41	25.57	85.8	1018	0
04/26	915	1.689	120.5	30.46	26.07	82.1	1018	0
04/26	930	2.381	116.5	22.36	26.31	78.4	1018	0
04/26	945	2.125	120.9	22.9	26.87	75.1	1018	0

001160.0353

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/26	1000	1.653	139.1	29.52	27.49	71.3	1018	0
04/26	1015	1.723	134.4	30.98	27.74	68.7	1018	0
04/26	1030	1.826	128.1	28.56	28.02	66.73	1018	0
04/26	1045	1.896	153.2	32.04	28.32	64.58	1018	0
04/26	1100	2.765	120.9	19.39	28.21	63.13	1018	0
04/26	1115	2.602	121.4	27.59	28.62	61.21	1018	0
04/26	1130	2.849	126.2	25.55	28.76	58.97	1018	0
04/26	1145	2.415	130.9	27.56	29.12	57.46	1018	0
04/26	1200	2.21	142.8	31.88	29.33	56.85	1018	0
04/26	1215	2.007	149.3	37.31	29.6	56.81	1018	0
04/26	1230	2.946	139.3	27.15	29.1	57.33	1018	0
04/26	1245	2.823	122.9	24.56	29.19	56.5	1018	0
04/26	1300	3.334	114.3	17.61	28.99	53.91	1018	0
04/26	1315	3.092	115.7	25.44	29.03	55.08	1018	0
04/26	1330	3.086	120.5	24.85	29.23	54.93	1018	0
04/26	1345	2.366	126.8	30.89	29.42	55.27	1018	0
04/26	1400	2.046	129.4	27.96	29.57	55.28	1018	0
04/26	1415	2.473	126.8	29.63	29.69	54.49	1018	0
04/26	1430	2.484	135.6	28.89	29.65	54.22	1018	0
04/26	1445	3.143	126	23.31	29.46	54.71	1017	0
04/26	1500	2.558	131.9	22.95	29.61	54.6	1017	0
04/26	1515	2.516	123.8	24.89	29.66	54.63	1017	0
04/26	1530	2.45	131.8	30.72	29.56	54.46	1017	0
04/26	1545	2.01	139.5	35.49	29.72	54.3	1017	0
04/26	1600	2.309	129.3	34.71	29.43	55.24	1017	0
04/26	1615	2.735	122.2	25.58	29.16	56.07	1017	0

001160.0354

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/26	1630	2.131	125.1	26.29	29.31	56.41	1016	0
04/26	1645	2.78	120	24.44	28.92	55.48	1016	0
04/26	1700	2.138	136.8	29.46	28.96	56.11	1016	0
04/26	1715	2.315	134	25.23	28.7	56.48	1016	0
04/26	1730	2.253	136.3	25.19	28.58	57.06	1016	0
04/26	1745	2.107	125.7	26.19	28.4	57.34	1016	0
04/26	1800	1.916	129	25.85	28.28	57.85	1016	0
04/26	1815	1.864	135.9	27.09	28.14	58.05	1016	0
04/26	1830	2.031	130.4	26.59	27.73	60.09	1016	0
04/26	1845	2.359	128.7	21.35	27.37	62.02	1016	0
04/26	1900	2.592	124.2	22.31	27	63.69	1016	0
04/26	1915	2.43	126	22.31	26.46	64.95	1016	0
04/26	1930	2.613	122.8	20.78	26.1	66.83	1016	0
04/26	1945	2.424	111.7	17.02	25.85	68.53	1017	0
04/26	2000	2.381	114.1	16.25	25.55	70.5	1017	0
04/26	2015	2.853	108	15.95	25.4	72.4	1017	0
04/26	2030	2.514	115.3	17	25.23	74.5	1017	0
04/26	2045	1.787	116.1	19.4	24.97	76.6	1017	0
04/26	2100	1.9	106.4	17.56	24.8	78.4	1017	0
04/26	2115	2.285	102	14.79	24.61	80.6	1017	0
04/26	2130	2.378	102.7	16.23	24.4	82.9	1017	0
04/26	2145	2.092	102.6	14.31	24.25	84.2	1017	0
04/26	2200	2.469	100	16.83	24.17	85.1	1017	0
04/26	2215	2.358	104	15.83	24.13	85.3	1018	0
04/26	2230	2.454	107	12.24	24.12	85.6	1018	0
04/26	2245	1.614	106.9	17.41	24.01	86.5	1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/26	2300	1.638	110.9	16.8	24.04	87.2	1018	0
04/26	2315	1.955	116.9	15.34	24.06	87.3	1018	0
04/26	2330	1.407	132	19.49	23.8	88.2	1018	0
04/26	2345	1.472	128.5	23.13	23.68	89.2	1018	0
04/27	0	2.273	124	19.33	23.81	89.2	1018	0
04/27	15	2.351	120.1	15.53	23.97	88.4	1018	0
04/27	30	1.982	125.4	18.55	23.97	88.6	1018	0
04/27	45	1.895	127.2	21.29	23.94	89.2	1018	0
04/27	100	1.418	131.9	20.57	23.7	90.2	1018	0
04/27	115	1.495	127.1	21.81	23.51	90.4	1018	0
04/27	130	1.225	131.1	25.25	23.39	90.8	1018	0
04/27	145	1.542	128.9	19.27	23.39	91.6	1018	0
04/27	200	1.877	123.2	19.21	23.57	91.9	1018	0
04/27	215	2.106	124.8	22.53	23.62	91.5	1018	0
04/27	230	1.735	136.5	25.05	23.47	91.3	1017	0
04/27	245	2.001	136.3	22.18	23.5	91.3	1017	0
04/27	300	1.659	129.3	20.05	23.59	91.4	1017	0
04/27	315	1.247	134.4	22.75	23.39	92.5	1017	0
04/27	330	1.541	129.4	21.63	23.24	93.5	1017	0
04/27	345	1.35	137.1	16.16	23.12	93.5	1017	0
04/27	400	1.176	133.8	21.22	22.92	93.7	1017	0
04/27	415	0.931	131.6	20.53	22.69	94.6	1017	0
04/27	430	1.033	133.7	13.4	22.5	96	1017	0
04/27	445	1.112	131.9	17.31	22.47	96.9	1017	0
04/27	500	1.266	135.8	18.11	22.6	97.5	1017	0
04/27	515	1.158	136.8	23.08	22.53	98.2	1016	0

001160.0356

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/27	530	1.131	131.1	17.32	22.54	98.8	1016	0
04/27	545	1.311	138.7	22.02	22.48	99.8	1016	0
04/27	600	1.047	140.9	17.76	22.52	100.1	1017	0
04/27	615	1.167	134	19.58	22.44	100.4	1017	0
04/27	630	1.829	120	19.04	22.5	100.4	1017	0
04/27	645	2.375	116.3	13.11	22.77	99.2	1017	0
04/27	700	1.992	124	18.2	22.95	98.2	1017	0
04/27	715	1.852	124.6	19.55	23.34	96.9	1017	0
04/27	730	2.117	126.9	23.71	23.67	95.4	1017	0
04/27	745	2.011	123.4	22.95	23.88	94.1	1018	0
04/27	800	1.987	124.5	21.21	24.27	92.4	1018	0
04/27	815	1.784	124.5	24.17	24.75	90	1018	0
04/27	830	2.26	126.2	27.79	25.1	86.2	1018	0
04/27	845	2.583	123.8	18.58	25.24	82	1018	0
04/27	900	2.284	131.1	23.55	25.57	79.2	1018	0
04/27	915	2.229	125.4	23.61	25.77	76	1018	0
04/27	930	2.475	116.9	22.45	26.66	70.7	1018	0
04/27	945	2.42	129.9	26.25	26.99	64.24	1018	0
04/27	1000	3.517	116	17.39	27.1	60.62	1018	0
04/27	1015	3.504	125.6	20.06	26.99	61.22	1018	0
04/27	1030	3.973	118.6	21.73	27.16	60.82	1018	0
04/27	1045	3.568	123.5	24.75	27.12	60.75	1018	0
04/27	1100	3.643	113.7	20.28	27.15	59.42	1018	0
04/27	1115	3.6	122.1	23.02	27.32	58.56	1019	0
04/27	1130	3.661	119.2	18.94	27.36	56.49	1019	0
04/27	1145	3.893	121.2	16.15	27.39	53.99	1019	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/27	1200	3.567	118.5	18.77	27.67	55.03	1019	0
04/27	1215	3.685	111.7	20.07	28.08	53.94	1019	0
04/27	1230	3.118	126.3	20.16	28.48	50.93	1019	0
04/27	1245	3.097	128.2	29.01	28.46	50.67	1019	0
04/27	1300	3.091	130.8	25.66	28.79	50.96	1019	0
04/27	1315	2.225	129.6	30.9	29.27	51.68	1019	0
04/27	1330	3.522	111.3	18.86	28.6	52.77	1019	0
04/27	1345	2.526	141.8	27.79	29	53.28	1019	0
04/27	1400	2.589	126.6	27.83	29.44	51.88	1019	0
04/27	1415	2.785	133.4	32.87	29.4	51.03	1019	0
04/27	1430	2.357	142.6	33.06	29.65	48.97	1019	0
04/27	1445	2.649	125.1	24.66	29.89	45.93	1019	0
04/27	1500	2.503	137.2	29.77	30.01	44.22	1019	0
04/27	1515	2.797	122.5	30.58	29.73	44.31	1019	0
04/27	1530	2.667	128.2	25.6	29.84	41.53	1019	0
04/27	1545	2.559	138.5	31.27	29.84	38.91	1019	0
04/27	1600	2.694	123.8	29.94	29.7	38.72	1019	0
04/27	1615	2.552	139.1	28.18	29.79	37.26	1019	0
04/27	1630	2.481	137.1	28.61	29.73	38.29	1019	0
04/27	1645	2.503	125.8	26.25	29.3	39.66	1019	0
04/27	1700	2.295	121.8	23.47	29.29	39.89	1019	0
04/27	1715	2.202	122.5	23.36	29.17	41.5	1019	0
04/27	1730	2.491	109.5	23.32	29.09	41.86	1019	0
04/27	1745	2.668	116.9	20.61	28.91	41.2	1019	0
04/27	1800	3.288	92.6	18.73	28.68	41.48	1019	0
04/27	1815	3.247	103.2	16.63	28.46	41.88	1019	0

001160.0358

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/27	1830	3.368	92.1	18.6	27.98	45.18	1019	0
04/27	1845	3.527	90.5	15.64	27.77	46.71	1019	0
04/27	1900	3.323	96.8	16.7	27.26	51.93	1019	0
04/27	1915	2.974	95.2	15.55	26.81	57.25	1019	0
04/27	1930	3.074	87.8	16.53	26.46	60.69	1019	0
04/27	1945	2.836	76.7	17.95	26.14	63.97	1019	0
04/27	2000	2.94	78.4	17.97	25.9	66.88	1019	0
04/27	2015	2.479	73.4	14.11	25.58	69.1	1020	0
04/27	2030	2.818	82.2	16.22	25.53	70.9	1020	0
04/27	2045	2.469	96.9	17.83	25.56	71.2	1020	0
04/27	2100	2.196	104.6	17.31	25.27	71.8	1020	0
04/27	2115	2.083	106.3	19.02	25.06	73.3	1020	0
04/27	2130	2.327	105.7	16.12	24.96	74.9	1020	0
04/27	2145	2.026	108.5	16.93	24.75	76.5	1021	0
04/27	2200	1.439	110.9	17.59	24.59	78	1021	0
04/27	2215	1.374	107	17.88	24.39	80.2	1021	0
04/27	2230	1.689	106.7	17.23	24.45	81.7	1021	0
04/27	2245	2.419	112.4	17.94	24.56	82.3	1021	0
04/27	2300	2.111	106.9	18.06	24.49	83.2	1021	0
04/27	2315	1.791	102.3	18.36	24.26	84.5	1021	0
04/27	2330	1.199	112	17.56	24.14	85.5	1021	0
04/27	2345	0.944	110.1	18.94	23.87	87.4	1021	0
04/28	0	0.954	122	23.22	23.85	88.6	1021	0
04/28	15	1.635	102.5	15.34	23.92	89.1	1020	0
04/28	30	1.901	105.4	14.47	23.92	89.4	1020	0
04/28	45	2.045	105.5	15.93	23.84	90.6	1020	0

001160.0359

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/28	100	1.99	102.4	20.47	23.78	92	1020	0
04/28	115	2.069	107.3	12.56	23.72	92.8	1020	0
04/28	130	2.097	104.4	16.48	23.79	92.7	1020	0
04/28	145	1.769	107.7	19.04	23.73	92.6	1020	0
04/28	200	1.475	117.4	17.06	23.64	92.7	1019	0
04/28	215	1.753	111.2	17.41	23.61	92.9	1019	0
04/28	230	1.792	112.3	16.46	23.62	92.6	1019	0
04/28	245	1.757	109.8	14.84	23.5	92.5	1019	0
04/28	300	1.819	111.2	14.81	23.36	92.7	1019	0
04/28	315	1.613	115.6	17.35	23.3	92.8	1019	0
04/28	330	1.481	114.3	15.45	23.15	93.2	1019	0
04/28	345	1.403	112.3	17.11	23.06	93.3	1019	0
04/28	400	1.218	100.4	17.96	22.91	93.8	1019	0
04/28	415	0.989	98.9	15.35	22.78	94.7	1019	0
04/28	430	0.713	109.6	20.68	22.42	96.4	1019	0
04/28	445	0.851	124.2	20	22.26	97.3	1019	0
04/28	500	0.976	134.2	16.41	22.23	97.5	1019	0
04/28	515	0.756	116.7	14.95	22.16	97.9	1019	0
04/28	530	0.526	136	18.6	21.81	98.9	1019	0
04/28	545	0.208	145.5	11.34	21.43	100.2	1019	0
04/28	600	0	141.2	0.46	20.87	100.8	1019	0
04/28	615	0.016	99.6	9.05	20.53	101.8	1019	0
04/28	630	0.578	76.4	6.325	20.41	102.6	1019	0
04/28	645	1.202	87.7	10.35	21.26	103	1019	0
04/28	700	0.871	99.8	13.01	21.98	100.8	1019	0
04/28	715	1.658	103.4	17.87	22.93	96.3	1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/28	730	1.686	107	17.58	23.51	92.8	1020	0
04/28	745	1.525	110.2	21.06	24.04	90.2	1020	0
04/28	800	2.025	100.2	18.14	24.49	87.5	1020	0
04/28	815	2.571	104.1	17.54	24.83	85	1020	0
04/28	830	2.437	100.2	17.38	25.24	82.3	1020	0
04/28	845	2.525	96.5	22.26	25.63	79.1	1020	0
04/28	900	3	96.6	20.18	25.82	76.4	1020	0
04/28	915	3.065	94.8	18.04	26.04	74.5	1021	0
04/28	930	3.767	107.1	19.24	26.14	72.5	1020	0
04/28	945	3.737	104.9	19.15	26.82	67.58	1020	0
04/28	1000	3.257	109.6	18.82	27.47	62.48	1020	0
04/28	1015	3.198	121.6	20	27.07	60.28	1021	0
04/28	1030	3.113	128.3	21.2	27.22	58.11	1021	0
04/28	1045	3.57	121.6	23.08	27.2	56.98	1021	0
04/28	1100	3.282	115.4	25.3	27.45	56.56	1021	0
04/28	1115	3.063	121.2	20.77	27.75	54.76	1021	0
04/28	1130	3.548	119.7	19.33	27.32	55.6	1020	0
04/28	1145	3.544	116.1	21.27	27.53	56.1	1020	0
04/28	1200	3.597	112.9	17.59	27.32	57.5	1020	0
04/28	1215	4.54	107.4	21.79	27.82	57.47	1020	0
04/28	1230	4.566	113.6	16.31	27.74	56.94	1020	0
04/28	1245	3.679	121.2	22.01	28.16	55.52	1020	0
04/28	1300	3.849	119.3	21.73	28.72	53.58	1020	0
04/28	1315	3.859	121.9	17.46	28.77	53	1020	0
04/28	1330	3.722	126.1	19.37	28.7	52.58	1020	0
04/28	1345	4.107	116	17.37	28.78	51.29	1019	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/28	1400	3.655	123.2	24.27	29.3	50.9	1019	0
04/28	1415	3.314	124.2	24.12	29.14	50.11	1019	0
04/28	1430	3.447	117.2	21.88	29.15	50.88	1019	0
04/28	1445	3.313	121.1	22.56	29.16	50.79	1019	0
04/28	1500	2.862	126.4	24.68	29.5	51.18	1019	0
04/28	1515	3.61	119.6	18.68	29.42	50.46	1019	0
04/28	1530	3.505	130	23.77	28.95	51.18	1018	0
04/28	1545	3.489	121.9	17.02	28.56	52.17	1018	0
04/28	1600	3.011	124.3	20.93	28.34	53.42	1018	0
04/28	1615	2.62	130.1	25.27	28.06	54.31	1018	0
04/28	1630	2.884	125	20.15	28	56.86	1018	0
04/28	1645	2.884	129.3	27.89	28.43	57.12	1018	0
04/28	1700	2.783	126.9	24	28.37	57.81	1018	0
04/28	1715	3.091	128.1	17.89	27.59	59.84	1018	0
04/28	1730	3.571	115.8	17.48	27.85	60.17	1018	0
04/28	1745	2.984	125.5	24.56	27.53	60.4	1018	0
04/28	1800	3.184	123.9	23.35	27.67	59.98	1018	0
04/28	1815	3.181	129.6	23.37	27.45	60.52	1017	0
04/28	1830	3.23	127.2	25.01	27.28	62.08	1017	0
04/28	1845	3.437	124.2	19.43	26.9	64.48	1017	0
04/28	1900	2.889	117	21.74	26.63	66.92	1017	0
04/28	1915	3.761	110.9	15.86	26.37	69.45	1017	0
04/28	1930	4.056	108.8	15.18	25.99	71.3	1017	0
04/28	1945	3.404	114.8	15.89	25.82	72	1018	0
04/28	2000	3.122	113.9	15.73	25.68	73.2	1018	0
04/28	2015	3.118	115.8	19.46	25.57	73.3	1018	0

001160.0362

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/28	2030	2.971	116.6	15.2	25.45	74	1018	0
04/28	2045	2.944	116.9	16.47	25.25	75	1018	0
04/28	2100	3.155	112.4	19.12	25.04	76	1018	0
04/28	2115	3.259	115	17.78	24.92	76.4	1018	0
04/28	2130	2.846	118.5	17.05	24.8	76.9	1018	0
04/28	2145	2.602	117.3	14.31	24.71	77.4	1018	0
04/28	2200	2.582	112.4	18.94	24.68	77.5	1018	0
04/28	2215	2.925	113.2	14.93	24.58	77.7	1018	0
04/28	2230	2.833	111.3	14.77	24.52	78.1	1018	0
04/28	2245	2.844	112.7	16.13	24.55	77.3	1018	0
04/28	2300	1.804	122.5	19.89	24.38	78.1	1018	0
04/28	2315	2.319	118.3	16.09	24.31	78.4	1018	0
04/28	2330	2.009	120.2	19.98	24.32	77.9	1018	0
04/28	2345	2.436	123.6	22.35	24.24	77.8	1018	0
04/29	0	2.334	123.7	16.77	24.12	78.5	1018	0
04/29	15	2.3	117.4	18.9	24.07	78.8	1018	0
04/29	30	2.34	118	14.76	23.98	79.4	1018	0
04/29	45	2.247	121.2	13.86	23.86	79.8	1017	0
04/29	100	2.947	117.2	13.99	23.9	79.8	1018	0
04/29	115	2.469	119.8	18.02	23.88	80	1018	0
04/29	130	1.77	127.3	17.54	23.69	80.7	1018	0
04/29	145	1.56	129.8	21.1	23.55	81.3	1017	0
04/29	200	1.516	131.2	20.43	23.36	82.2	1017	0
04/29	215	1.836	123.5	18.24	23.33	82.3	1017	0
04/29	230	1.561	136.8	27.05	23.24	82.4	1017	0
04/29	245	1.626	135.5	18.35	23.21	82.7	1017	0

001160.0363

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/29	300	1.258	137.8	23.71	23.11	83.2	1017	0
04/29	315	0.927	131.3	23.35	23	84	1017	0
04/29	330	0.938	136.7	25.32	22.91	85.3	1017	0
04/29	345	1.02	131.1	17.1	22.9	86.4	1017	0
04/29	400	1.187	130.6	22.41	22.86	87.5	1017	0
04/29	415	0.98	131.8	22.75	22.85	88.4	1017	0
04/29	430	0.86	133.4	19.29	22.81	89.2	1017	0
04/29	445	0.682	136.5	17.94	22.67	90.4	1017	0
04/29	500	0.684	140	25.92	22.55	91.6	1017	0
04/29	515	1.067	125.8	20.28	22.58	92.1	1017	0
04/29	530	1.289	133	26.39	22.74	90.9	1017	0
04/29	545	1.26	133.5	22.17	22.66	90.4	1017	0
04/29	600	1.179	131.4	21.72	22.55	90.5	1017	0
04/29	615	0.874	132.9	20.47	22.42	90.9	1018	0
04/29	630	0.774	136.7	18.75	22.2	92	1018	0
04/29	645	0.354	156.5	17.83	22	93.2	1018	0
04/29	700	0.645	123.8	12.44	22.04	94.3	1018	0
04/29	715	0.485	137.2	19.71	22.68	92.6	1018	0
04/29	730	1.025	131.6	22.76	23.34	89.7	1018	0
04/29	745	1.421	125.7	19.69	23.63	88.4	1018	0
04/29	800	1.435	132.1	21.84	23.98	86.8	1018	0
04/29	815	2.372	121	19.7	24.5	84.4	1018	0
04/29	830	1.743	123.4	25.75	24.78	83.3	1018	0
04/29	845	1.866	126.7	27.33	25.24	81.7	1017	0
04/29	900	1.368	129.3	25.85	24.96	81.8	1018	0
04/29	915	2.15	129.7	24.31	25.16	81.8	1017	0

001160.0364

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/29	930	1.693	139.3	34.34	25.28	80.8	1018	0
04/29	945	1.344	133.8	41.43	25.81	79.5	1018	0
04/29	1000	1.697	130.7	27.53	25.94	78.2	1018	0
04/29	1015	1.415	130.5	35.02	26.39	77.1	1018	0
04/29	1030	1.224	159.2	42.43	26.5	76.4	1018	0
04/29	1045	1.293	174.1	42.91	27.67	72.4	1018	0
04/29	1100	1.175	156.9	38.5	28.19	69.46	1018	0
04/29	1115	1.583	168.5	37.11	28.3	67.09	1018	0
04/29	1130	2.142	154.8	31.33	28.43	64.96	1018	0
04/29	1145	1.333	159.8	43.06	28.13	65.53	1018	0
04/29	1200	1.676	154.2	33.23	28.45	63.8	1018	0
04/29	1215	1.459	162.4	43.26	28.18	63.88	1018	0
04/29	1230	1.485	162.7	38.7	27.16	68.26	1018	0
04/29	1245	1.574	178.4	44.29	27.5	70.3	1018	0
04/29	1300	1.174	198.2	39.5	27.18	71.5	1018	0
04/29	1315	1.199	172.6	42.58	28.03	70.2	1017	0
04/29	1330	1.664	147.1	35.44	27.39	68.89	1017	0
04/29	1345	1.958	128.7	23.69	27.01	68.86	1017	0
04/29	1400	1.546	146.4	25.4	27.67	69.03	1017	0
04/29	1415	1.813	133.9	25.81	27.44	70.7	1017	0
04/29	1430	1.306	143.3	29.48	26.94	73	1017	0
04/29	1445	1.182	126.8	34.96	26.96	74.3	1017	0
04/29	1500	0.8	190	44.55	27.26	70.8	1017	0
04/29	1515	0.705	164.4	38.02	27.22	70.5	1017	0
04/29	1530	0.683	188	31.59	27.17	71.5	1017	0
04/29	1545	1.673	54.01	16.79	26.38	74.2	1017	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/29	1600	2.048	38.03	22.97	25.55	77.5	1017	0
04/29	1615	1.252	53.55	21.96	25.46	78.5	1017	0
04/29	1630	1.945	30.19	22.2	25.52	79	1017	0
04/29	1645	4.687	326.7	24.67	22.89	92	1019	0.41
04/29	1700	3.053	7.98	32.61	20.57	103.3	1018	0.44
04/29	1715	3.179	52.6	18.68	20.22	106	1018	0.02
04/29	1730	2.334	65.79	13.71	19.77	106.4	1017	0.01
04/29	1745	2.018	102.5	21.1	20.07	106.3	1017	0.01
04/29	1800	2.77	112.2	12.1	20.77	105	1016	0
04/29	1815	2.889	110.1	21.02	20.82	101.9	1017	0
04/29	1830	2.563	93.5	16.16	20.97	97.2	1018	0
04/29	1845	2.395	112.7	20.96	20.9	94.3	1017	0
04/29	1900	2.033	120.3	16.25	20.62	95.5	1018	0
04/29	1915	1.719	116.2	27.36	20.74	96.5	1018	0
04/29	1930	1.016	162.6	35.8	20.69	97.4	1018	0
04/29	1945	1.241	144.2	30.59	20.67	97.9	1017	0
04/29	2000	1.986	131.9	23.8	20.85	97.6	1017	0
04/29	2015	0.605	173.3	35.86	20.93	97.7	1018	0
04/29	2030	0.952	140	25.07	20.87	97.7	1017	0
04/29	2045	0.567	161.4	53.88	20.77	96.1	1018	0
04/29	2100	0.417	174	25.47	20.67	97.2	1018	0
04/29	2115	0.251	161	28.07	20.47	99.1	1018	0
04/29	2130	0.325	132.2	27.17	20.58	98.9	1018	0
04/29	2145	0.15	236	50.9	20.62	99.7	1018	0
04/29	2200	0.313	124.1	12.72	20.52	101.6	1018	0
04/29	2215	0.319	241.9	15.49	20.56	102.8	1018	0

001160.0366

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/29	2230	1.018	250.3	28.33	20.7	103.3	1018	0
04/29	2245	0.817	127.8	22.73	20.84	103.1	1018	0
04/29	2300	0.393	204.7	43.35	21.22	101	1018	0
04/29	2315	0.308	205.2	42.05	21.12	101.6	1018	0
04/29	2330	0.385	264.6	40.11	21.34	101.5	1018	0
04/29	2345	0.491	260.7	13.36	21.33	102.5	1018	0
04/30	0	0.311	291.3	9.38	21.36	103.2	1018	0
04/30	15	0.618	303	22.97	21.52	103.1	1018	0
04/30	30	0.253	335.5	10.15	21.49	103.2	1018	0
04/30	45	0.366	84	75.6	21.39	103.7	1018	0
04/30	100	0.346	149.1	11.37	21.34	104.1	1018	0
04/30	115	0.041	272.2	13.74	21.33	104.3	1018	0
04/30	130	0.556	283.1	5.861	21.39	104.5	1018	0
04/30	145	0.12	291.9	0.671	21.38	104.5	1017	0
04/30	200	0.149	196.1	58.9	21.3	104.6	1017	0
04/30	215	0.099	256.9	3.689	21.09	104.7	1017	0
04/30	230	0.385	277.6	2.493	20.91	104.8	1017	0.01
04/30	245	0	279.5	0	20.8	104.9	1017	0
04/30	300	0.834	291.7	7.36	20.64	105	1017	0
04/30	315	1.185	306.9	11.11	20.87	105	1017	0
04/30	330	0.985	298.7	9	21.1	104.6	1017	0
04/30	345	0.275	331.9	8.93	20.96	104.4	1016	0
04/30	400	0.174	257.9	16.9	20.71	104.6	1017	0
04/30	415	0.931	271.1	6.756	20.84	104.9	1017	0
04/30	430	0.632	280.9	9.6	21.14	105	1017	0
04/30	445	1.182	315.8	11.39	21.37	104.4	1017	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/30	500	1.323	310.8	10.95	21.94	98.7	1017	0
04/30	515	1.466	321.3	15.55	22.14	92.8	1017	0
04/30	530	1.544	328.4	13.62	22.25	90.2	1017	0
04/30	545	1.47	327.3	15.75	22.16	90.4	1017	0
04/30	600	1.885	321.1	13.04	22.26	89.3	1017	0
04/30	615	1.829	312.6	12.28	22.35	89.7	1018	0
04/30	630	2.455	316.9	15.05	22.37	91.7	1018	0
04/30	645	2.133	320.8	12.66	22.29	93.3	1018	0
04/30	700	2.351	332.2	17.99	22.32	93.7	1018	0
04/30	715	2.857	330.4	14.28	22.3	93.8	1018	0
04/30	730	2.754	337.7	13.73	22.24	93.7	1018	0
04/30	745	2.679	340.9	17.64	22.25	93.8	1018	0
04/30	800	2.695	343.2	19.23	22.28	94.2	1019	0
04/30	815	2.539	341.2	17.58	22.25	93.9	1019	0
04/30	830	2.963	355.7	18.19	22.05	93.9	1019	0
04/30	845	3.168	352.6	16.25	21.75	93.8	1019	0
04/30	900	2.993	351.4	15.57	21.68	93.5	1019	0
04/30	915	3.598	351.1	12.55	21.59	92.2	1019	0
04/30	930	3.385	347.9	15.77	21.33	91.9	1019	0
04/30	945	3.39	343.2	14.35	21.11	91.5	1020	0
04/30	1000	3.245	342.5	12.54	20.76	92.4	1020	0
04/30	1015	3.64	345.9	15.41	20.59	92.3	1020	0
04/30	1030	3.412	3.315	12.78	20.67	91	1020	0
04/30	1045	3.751	354.2	17.03	20.87	88.3	1020	0
04/30	1100	3.466	349.7	18.17	21.21	86.1	1020	0
04/30	1115	3.398	351.2	18.99	21.44	84.4	1020	0

001160.0368

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/30	1130	3.681	0.928	14.62	21.41	82.9	1019	0
04/30	1145	3.094	344.7	15.87	21.66	82.3	1019	0
04/30	1200	3.365	4.356	21.74	21.84	80.4	1019	0
04/30	1215	2.939	0.139	19.16	21.81	80.2	1019	0
04/30	1230	2.612	25.96	24.48	21.87	79.7	1019	0
04/30	1245	2.503	329.7	18.44	21.92	78.7	1020	0
04/30	1300	3.065	338.6	21.58	22.15	77.9	1019	0
04/30	1315	2.334	336.4	21.06	22.36	77.4	1019	0
04/30	1330	2.701	337.9	19.66	23.1	75.4	1019	0
04/30	1345	2.571	3.784	26.63	23.15	73.3	1019	0
04/30	1400	2.697	349.6	26.86	23.29	73.3	1019	0
04/30	1415	2.621	338.7	25.52	22.78	73.1	1019	0
04/30	1430	2.274	330.6	14.39	22.39	74	1019	0
04/30	1445	1.762	331.3	14.88	22.37	74.7	1019	0
04/30	1500	1.816	7.57	23.47	22.61	74.1	1019	0
04/30	1515	1.134	4.792	24.79	22.89	73.3	1018	0
04/30	1530	1.086	18.2	28.3	23.35	72.4	1018	0
04/30	1545	1.558	36.22	22.98	23.45	71.7	1018	0
04/30	1600	1.283	330.5	32.14	23.39	71.7	1018	0
04/30	1615	1.394	309.8	16.74	23.53	71.6	1018	0
04/30	1630	1.404	309.5	52.48	23.79	70.5	1017	0
04/30	1645	0.464	312	49.92	23.91	69.38	1017	0
04/30	1700	1.166	14.06	33.37	23.6	69.83	1017	0
04/30	1715	1.901	358.1	22.15	23.55	70.5	1017	0
04/30	1730	2.082	6.954	20.24	23.61	70.7	1017	0
04/30	1745	2.471	5.243	18.07	23.28	71.8	1017	0

001160.0369

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
04/30	1800	2.232	30.05	18.39	23.18	72	1017	0
04/30	1815	1.911	7.9	16.5	23.12	71.7	1017	0
04/30	1830	1.708	338.8	18.48	23.18	71.5	1017	0
04/30	1845	1.903	347.4	18	23.14	71.4	1017	0
04/30	1900	1.935	355.6	19.83	23.16	71.5	1017	0
04/30	1915	2	1.703	16.54	23.11	72	1017	0
04/30	1930	1.551	12.25	20.14	23.08	72.2	1017	0
04/30	1945	1.578	9.6	23.1	23.14	71.7	1017	0
04/30	2000	2.386	7.5	16.52	23.12	72.3	1017	0
04/30	2015	2.878	11.14	23.34	22.95	72.6	1017	0
04/30	2030	2.865	12.54	21.52	22.71	73.1	1017	0
04/30	2045	2.247	24.68	17.24	22.7	72.8	1018	0
04/30	2100	2.636	30.38	15.1	22.6	72.6	1018	0
04/30	2115	2.39	33.6	16.93	22.45	73.4	1018	0
04/30	2130	2.129	14.52	19.3	22.33	74.1	1018	0
04/30	2145	2.588	15.09	17.54	22.23	74.6	1018	0
04/30	2200	2.691	11.07	20.65	22.17	74.4	1018	0
04/30	2215	2.448	22.93	20.06	22.07	74.4	1018	0
04/30	2230	2.745	14.9	16.77	21.81	74.6	1018	0
04/30	2245	2.634	29.12	21.73	21.62	74.3	1018	0
04/30	2300	2.286	30.1	16.18	21.5	74.2	1019	0
04/30	2315	1.848	32.13	17.89	21.44	74.2	1019	0
04/30	2330	1.912	42.18	16.74	21.07	76.1	1019	0
04/30	2345	1.493	36.99	11.76	20.83	78.3	1019	0
05/01	0	1.907	350.9	27.27	20.48	82.5	1019	0
05/01	15	1.397	20.49	17.42	20	88.8	1019	0.01

001160.0370

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/01	30	1.887	27.23	21.26	19.87	91.8	1019	0
05/01	45	1.079	19.05	18.27	19.85	93.2	1019	0.01
05/01	100	1.093	19.17	15.62	19.74	95.2	1019	0.01
05/01	115	1.899	23.69	20.4	19.58	96	1018	0.01
05/01	130	1.549	24.93	19.97	19.46	96.4	1018	0.01
05/01	145	1.305	61.28	18.17	19.29	97.2	1018	0.02
05/01	200	1.18	74.7	20.92	19.03	97.9	1018	0.02
05/01	215	1.143	68.84	19.47	18.94	99	1018	0.02
05/01	230	1.578	59.34	19.33	18.82	98.4	1017	0.02
05/01	245	1.415	47.52	37.87	18.68	98.4	1017	0.01
05/01	300	1.4	58.17	44.54	18.67	98.7	1017	0.01
05/01	315	2.103	89.1	16.34	18.63	98.9	1016	0
05/01	330	1.392	80.5	20.3	18.68	98.6	1017	0
05/01	345	1.528	89	18.25	18.7	98.1	1017	0.01
05/01	400	1.859	346.9	25.62	18.75	98	1018	0
05/01	415	1.438	331.4	18.31	18.73	98.5	1018	0
05/01	430	1.877	333.5	18.71	18.78	97.6	1018	0
05/01	445	2.172	6.119	16.76	18.61	93.2	1018	0.01
05/01	500	1.513	57.99	23.14	18.46	92.2	1017	0.01
05/01	515	1.785	81.5	11.56	18.24	93	1018	0
05/01	530	0.947	30.93	22.95	18.19	93.5	1018	0.01
05/01	545	1.651	64.02	18.12	17.97	94.3	1017	0.01
05/01	600	1.807	51.58	23.99	17.9	95.2	1018	0.01
05/01	615	2.28	75.5	20.18	18.11	93.4	1018	0
05/01	630	2.778	96.9	14.32	18.12	93.3	1018	0
05/01	645	2.629	89	14.07	18.01	95.4	1017	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/01	700	2.615	93.6	15.66	18.34	96	1017	0
05/01	715	2.674	105.6	15.19	18.78	95.7	1017	0
05/01	730	2.164	122.2	21.08	19.07	96.2	1018	0
05/01	745	2.16	87.8	30.46	19.29	96.4	1018	0
05/01	800	1.927	21.74	15.28	19.26	97.4	1018	0
05/01	815	2.252	34.66	13.27	18.87	98.4	1018	0
05/01	830	2.268	42.48	14.52	18.76	98.4	1018	0
05/01	845	2.514	40.49	18.51	18.6	97.4	1018	0
05/01	900	2.241	47.71	16.87	18.52	97.7	1018	0
05/01	915	3.126	41.39	14.71	18.46	96.4	1018	0
05/01	930	2.638	42.72	19.61	18.28	94.3	1018	0
05/01	945	2.66	23.48	18.9	18.24	93.3	1018	0
05/01	1000	2.832	32.96	14.19	18.32	92.2	1019	0
05/01	1015	3.336	34.67	13.55	18.27	89.2	1019	0
05/01	1030	2.919	39.58	14.82	18.44	88.2	1019	0
05/01	1045	2.393	56.88	16.98	18.53	87.6	1019	0
05/01	1100	2.563	52.11	13.66	18.72	87	1019	0
05/01	1115	2.81	46.05	14.55	18.91	86.9	1019	0
05/01	1130	3.134	53.8	16.13	19.25	85.2	1019	0
05/01	1145	2.745	63.44	24.68	19.65	84	1018	0
05/01	1200	2.633	46.7	17.3	20.05	82.3	1018	0
05/01	1215	2.323	35.88	16.8	20.37	81	1019	0
05/01	1230	2.347	51.38	20.84	20.32	80.6	1019	0
05/01	1245	2.345	56.99	22.32	20.55	80	1018	0
05/01	1300	2.553	64.24	18.83	20.68	79.6	1018	0
05/01	1315	2.476	82.6	20.62	20.9	79.2	1018	0

001160.0372

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/01	1330	2.597	78.1	19.67	21.34	77.6	1018	0
05/01	1345	2.8	77.7	15.56	21.27	77.6	1018	0
05/01	1400	2.473	86.3	20.02	21.16	79	1017	0
05/01	1415	2.806	93.9	15.94	21.22	79.3	1017	0
05/01	1430	3.18	91.7	21.81	21.42	79.6	1017	0
05/01	1445	3.241	77.8	17.6	21.99	79.1	1017	0
05/01	1500	3	87.8	16.78	22.04	79.2	1017	0
05/01	1515	2.767	91.7	16	22.08	79.5	1016	0
05/01	1530	2.977	80.7	16.07	22.11	79.6	1016	0
05/01	1545	3.186	86.2	16.83	22.53	79.2	1016	0
05/01	1600	3.158	92	13.38	22.51	79.4	1016	0
05/01	1615	2.737	94.9	20.45	22.81	79.4	1016	0
05/01	1630	2.805	92.4	18.55	22.74	79.5	1015	0
05/01	1645	2.783	83	16.26	23.04	79.5	1015	0
05/01	1700	3.053	90	17.21	22.79	80.3	1015	0
05/01	1715	3.116	82.3	15.29	22.99	80.8	1015	0
05/01	1730	3.238	87.4	16.19	23.23	80.5	1015	0
05/01	1745	3.073	86.1	16.61	23.2	80.3	1015	0
05/01	1800	3.072	89.2	13.73	23.23	80.2	1015	0
05/01	1815	2.618	93.8	16.92	23.25	81.2	1015	0
05/01	1830	2.558	84.9	15.79	23.39	80.9	1015	0
05/01	1845	3.09	94.4	14.33	23.43	80.4	1015	0
05/01	1900	3.241	86.5	13.87	23.11	82	1015	0
05/01	1915	3.191	94.8	14.57	22.94	82.5	1015	0
05/01	1930	2.584	94.7	15.33	22.9	82.9	1015	0
05/01	1945	2.95	95.4	16.61	22.82	83.3	1015	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/01	2000	2.725	97.9	14.09	22.9	83.9	1015	0
05/01	2015	2.572	106.7	16.39	22.87	84.7	1015	0
05/01	2030	1.743	102.6	15.9	22.83	86	1015	0
05/01	2045	2.445	113	13.95	22.86	86	1015	0
05/01	2100	2.362	110.2	18.03	22.82	86.6	1015	0
05/01	2115	3.041	100.5	14.93	22.87	87.1	1015	0
05/01	2130	2.639	106.9	16.81	22.81	88.3	1016	0
05/01	2145	2.781	103.2	13.52	22.85	89.1	1016	0
05/01	2200	2.318	100.4	15.81	22.78	89.8	1015	0
05/01	2215	2.209	104.2	16.54	22.8	90.7	1016	0
05/01	2230	2.078	106.7	19.43	22.89	90.6	1015	0
05/01	2245	2.957	99.9	13.64	23.07	89.4	1015	0
05/01	2300	2.894	110	15.57	23.08	89	1015	0
05/01	2315	3.322	113	16.66	23.18	88.3	1015	0
05/01	2330	3.133	114.5	16	23.24	87.9	1014	0
05/01	2345	3.097	112.7	19.62	23.35	87.3	1014	0
05/02	0	2.297	117.7	16.5	23.33	87.5	1014	0
05/02	15	1.813	115.4	20.08	23.31	87.8	1015	0
05/02	30	2.188	110.9	18.73	23.32	88.4	1015	0
05/02	45	2.536	115.8	16.8	23.36	88.8	1014	0
05/02	100	2.664	122.4	18.82	23.28	89.9	1014	0
05/02	115	2.799	120.6	19.25	23.22	91	1013	0
05/02	130	3.104	127.1	19.71	23.33	91	1013	0
05/02	145	2.795	123.7	18.86	23.39	90.9	1013	0
05/02	200	2.867	126.5	22.51	23.38	90.8	1013	0
05/02	215	2.484	123.7	20.49	23.31	91	1013	0

001160.0374

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/02	230	2.613	131.5	19.52	23.28	91.5	1013	0
05/02	245	2.599	124.2	19.84	23.29	92.1	1012	0
05/02	300	3.034	127.1	20.54	23.28	92.9	1012	0
05/02	315	2.533	131.2	22.31	23.35	93.3	1012	0
05/02	330	2.093	127.7	23.08	23.39	93.8	1012	0
05/02	345	1.776	132.7	28.47	23.46	94.3	1012	0
05/02	400	2.094	133.4	29	23.42	94.7	1012	0
05/02	415	1.699	139.4	36.41	23.3	95.9	1013	0
05/02	430	1.412	141	31.34	23.26	96.3	1013	0
05/02	445	1.449	140.7	36.55	23.25	96.3	1013	0
05/02	500	1.231	148.4	33.37	23.33	96.2	1013	0
05/02	515	0.93	194.1	41.38	23.32	96.4	1013	0
05/02	530	0.929	150.8	31.34	23.32	96.2	1013	0
05/02	545	0.612	143	40.6	23.2	97.1	1013	0
05/02	600	0.356	205.3	43.75	23.17	98.2	1013	0
05/02	615	0.265	178	40.94	23.19	98.8	1013	0
05/02	630	0.672	210	25.99	23.25	99.4	1014	0
05/02	645	1.196	221.6	25.89	23.59	99	1014	0
05/02	700	1.724	218.7	21.77	24.02	97.6	1014	0
05/02	715	2.051	230.4	23.67	24.28	96.4	1014	0
05/02	730	1.928	242.6	16.2	24.3	96.8	1014	0
05/02	745	1.619	245.4	19.14	24.44	96.5	1015	0
05/02	800	1.476	248	20.58	24.59	95.3	1015	0
05/02	815	1.69	284.8	22.09	24.61	94.3	1014	0
05/02	830	2.624	343.3	18.36	23.53	91.7	1014	0
05/02	845	1.318	70.9	47.39	22.76	89.5	1013	0

001160.0375

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/02	900	1.238	144.6	26.38	22.91	90.5	1012	0
05/02	915	1.547	129.8	34.51	23.56	90.9	1012	0
05/02	930	1.868	326.4	41.15	24.01	91.3	1014	0
05/02	945	2.472	359.8	20.13	23.8	91.1	1014	0
05/02	1000	3.59	3.804	14.84	22.87	89.2	1014	0
05/02	1015	2.175	5.572	15.97	22.69	88.7	1014	0
05/02	1030	2.592	14.79	16.98	21.97	90.1	1014	0
05/02	1045	2.378	36.57	24.24	22.25	88.3	1014	0
05/02	1100	1.976	64.41	24.03	22.23	87	1014	0
05/02	1115	2.465	4.338	31.63	22.02	87.9	1014	0
05/02	1130	1.894	96.9	17.27	22.06	87.1	1014	0.01
05/02	1145	0.876	76.3	73.6	22.57	86.5	1014	0
05/02	1200	0.791	298.9	54.2	23.09	86.6	1014	0
05/02	1215	1.115	352.4	19.71	22.83	88.4	1014	0.02
05/02	1230	1.299	42.62	24.64	22.61	93.4	1014	0
05/02	1245	0.733	95.2	23.1	22.94	93.6	1014	0.02
05/02	1300	0.973	46.23	31.62	23.56	94.8	1013	0.01
05/02	1315	1.112	323.4	26.64	24.56	92	1013	0
05/02	1330	1.569	285.2	16.47	24.94	91.6	1013	0
05/02	1345	1.471	287	14.92	24.67	93	1013	0
05/02	1400	0.973	265.1	35.21	25.4	92.1	1013	0
05/02	1415	1.698	238.3	23.94	27.26	85.2	1013	0
05/02	1430	2.084	248.9	23.98	28.06	77.7	1012	0
05/02	1445	2.091	235.3	29.15	28.52	72.1	1012	0
05/02	1500	1.764	232.4	29.66	28.87	67.86	1012	0
05/02	1515	1.947	251.8	26.28	29.32	64.84	1012	0

001160.0376

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/02	1530	1.981	273	27.76	29.31	62.98	1012	0
05/02	1545	2.932	344.5	23.13	27.39	69.25	1012	0
05/02	1600	4.279	331.4	14.49	24.8	85.6	1012	0.07
05/02	1615	2.528	330.4	13.98	25.03	93.6	1012	0
05/02	1630	3.435	326.2	16.45	26.2	87	1012	0
05/02	1645	3.625	318.8	16.05	26.07	81.2	1012	0
05/02	1700	3.393	321.8	15.88	26.15	79	1012	0
05/02	1715	3.777	324.6	17.42	25.79	79.2	1013	0
05/02	1730	3.997	316.5	17.4	25.9	77.9	1013	0
05/02	1745	3.925	309.4	16.89	26.06	74.4	1013	0
05/02	1800	3.609	310.9	18.07	26.07	72.7	1013	0
05/02	1815	3.669	315.6	15.06	25.78	72.3	1012	0
05/02	1830	3.064	318	16.96	25.63	73.2	1013	0
05/02	1845	2.907	321.3	14.39	25.41	73.3	1013	0
05/02	1900	3.334	322.8	16.6	25.12	73.4	1013	0
05/02	1915	3.181	326.1	15.4	24.63	74.6	1013	0
05/02	1930	2.984	323.4	15.75	24.17	76.1	1013	0
05/02	1945	2.721	320.6	16.16	23.85	77.1	1013	0
05/02	2000	3.52	325.8	16.67	23.52	77.9	1013	0
05/02	2015	3.004	323.2	17.32	23.11	79	1013	0
05/02	2030	3.014	322.5	16.82	22.95	79.6	1014	0
05/02	2045	2.709	322.2	17.07	22.81	79.6	1014	0
05/02	2100	3.485	327.6	18.07	22.69	79.1	1014	0
05/02	2115	2.746	322.3	17.8	22.52	79.4	1014	0
05/02	2130	3.322	316.6	14.8	22.34	79.3	1014	0
05/02	2145	3.303	326.8	14.06	22.14	78.7	1015	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/02	2200	2.687	323.9	14.12	21.93	77.8	1015	0
05/02	2215	2.635	327.9	15.38	21.7	77.8	1015	0
05/02	2230	2.407	325.1	17.37	21.67	77.1	1015	0
05/02	2245	2.527	328.5	11.64	21.8	76.8	1015	0
05/02	2300	2.675	325.7	13.5	21.79	77.4	1015	0
05/02	2315	2.518	326.9	12.72	21.64	78.2	1015	0
05/02	2330	2.435	312.5	16.74	21.6	79.6	1015	0
05/02	2345	2.621	313.9	15.09	21.49	81.2	1016	0
05/03	0	2.881	337.7	16.31	21.56	79.9	1016	0
05/03	15	2.987	347.5	16.69	21.4	79.9	1016	0
05/03	30	2.475	339.9	15.18	21.18	80.8	1016	0
05/03	45	3.04	331.2	13.21	20.97	81.9	1016	0
05/03	100	3.117	335.5	14.08	20.85	81.9	1016	0
05/03	115	3.259	344.1	13.47	20.56	82.4	1015	0
05/03	130	2.991	340.5	14.72	20.42	82.5	1015	0
05/03	145	3.071	339.7	14.31	20.38	82.4	1015	0
05/03	200	3.537	341.8	10.87	20.31	82.8	1015	0
05/03	215	3.176	341.2	16.31	20.18	83.6	1015	0
05/03	230	3.469	341	16.43	20.16	83.9	1015	0
05/03	245	3.395	337.3	15.08	20.08	84.1	1015	0
05/03	300	3.053	338.7	14.32	20.01	84	1015	0
05/03	315	2.861	350.5	15.34	19.93	83.2	1015	0
05/03	330	2.799	356.3	13.16	19.93	81.6	1015	0
05/03	345	3.275	359.7	14.44	19.9	79.7	1015	0
05/03	400	2.996	352.8	15.14	19.63	80	1015	0
05/03	415	2.938	0.436	17.35	19.32	80.9	1015	0

001160.0378

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/03	430	2.739	5.908	17.83	19.2	81.4	1015	0
05/03	445	2.949	5.092	20.74	19.2	81.9	1015	0
05/03	500	2.132	358.6	19.81	19.06	83.2	1016	0
05/03	515	2.407	1.533	14.78	19.06	84.3	1016	0
05/03	530	2.614	357.6	11.84	19.11	85.1	1016	0
05/03	545	1.761	0.761	17.33	19.02	85.5	1016	0
05/03	600	1.549	2.44	14.09	19.01	85.4	1016	0
05/03	615	1.424	12.36	20.43	18.98	85.5	1016	0
05/03	630	1.203	48.02	21.91	18.93	86	1016	0
05/03	645	0.942	55.33	11.67	18.79	87.3	1016	0
05/03	700	1.126	32.03	12.46	19.15	86.9	1016	0
05/03	715	1.361	29.49	16.71	19.67	85.4	1017	0
05/03	730	2.248	24.84	18.98	19.94	83.8	1017	0
05/03	745	1.996	13.66	20.05	20.2	82.7	1017	0
05/03	800	2.846	17.9	17.77	20.21	81.8	1017	0
05/03	815	2.886	21.26	20	20.32	81.2	1017	0
05/03	830	2.525	23.05	18.97	20.52	80.1	1017	0
05/03	845	2.776	27.84	20.12	20.6	79.5	1017	0
05/03	900	2.36	34.07	22.24	20.65	79.4	1017	0
05/03	915	2.595	8.61	25.15	20.8	79.5	1018	0
05/03	930	2.674	15.85	26.14	21.06	78.2	1018	0
05/03	945	2.414	358	16.18	21.08	77.8	1018	0
05/03	1000	2.701	1.084	22.33	21.38	76.1	1018	0
05/03	1015	2.658	11.99	19.26	21.27	74.9	1018	0
05/03	1030	2.697	340.2	16.88	21.59	75.5	1018	0
05/03	1045	2.311	320	20.84	21.71	73.8	1018	0

001160.0379

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/03	1100	1.999	349.1	36.49	22.08	70.9	1018	0
05/03	1115	1.507	351.4	36.93	22.66	68.34	1018	0
05/03	1130	2.051	317.7	32.82	22.84	67.24	1018	0
05/03	1145	2.028	331.8	38.53	23.01	66.99	1018	0
05/03	1200	2.453	329.7	30.61	23.03	66.19	1018	0
05/03	1215	2.778	334	22.57	22.66	66.68	1018	0
05/03	1230	2.284	318.5	28.49	23.36	65.74	1018	0
05/03	1245	2.623	334.5	28.73	23.21	62.96	1017	0
05/03	1300	2.639	349.3	19.59	22.98	63.18	1017	0
05/03	1315	2.7	349.5	20.16	22.94	63.22	1017	0
05/03	1330	2.809	330.1	23.41	23.2	61.44	1017	0
05/03	1345	2.605	346.4	22.54	23.61	60.58	1016	0
05/03	1400	3.035	333.2	19.34	23.64	60.57	1016	0
05/03	1415	3.015	348.9	23.33	24.05	60.61	1016	0
05/03	1430	3.013	346.1	20.77	23.73	60.23	1016	0
05/03	1445	3.601	349.4	16.1	23.4	60.63	1016	0
05/03	1500	3.164	334.2	22.23	23.03	61.85	1016	0
05/03	1515	2.915	321.7	21.86	23.65	61.75	1016	0
05/03	1530	2.348	282.5	28.34	24.75	58.98	1016	0
05/03	1545	2.528	313.3	21.02	24.88	58.48	1016	0
05/03	1600	2.898	329	26.24	24.48	58.97	1016	0
05/03	1615	2.59	302.4	23.13	24.66	58.43	1016	0
05/03	1630	2.866	309.7	18.65	24	58.11	1016	0
05/03	1645	2.829	313.4	18.91	23	59.68	1016	0
05/03	1700	2.282	301.1	16.98	22.91	60.16	1016	0
[illegible]	1715	1.725	298.4	25.24	22.92	60.74	1016	0

001160.0380

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/03	1730	1.384	297.3	32.84	22.66	62.26	1017	0
05/03	1745	1.703	273.9	19	22.32	68.13	1016	0
05/03	1800	1.418	280.5	22.47	22.29	68.15	1017	0
05/03	1815	1.428	297.9	16.08	22.2	68.54	1017	0
05/03	1830	1.092	282.9	42.3	21.94	73.5	1017	0
05/03	1845	1.08	279.4	24.05	22.42	71.1	1017	0
05/03	1900	0.902	284.8	15.4	22.89	68.87	1017	0
05/03	1915	0.79	291.8	24	22.73	68.17	1017	0
05/03	1930	0.589	217.5	10.68	21.37	74.3	1017	0
05/03	1945	0.135	205.1	14.53	20.47	79.1	1017	0
05/03	2000	0.108	335.1	31.72	19.89	82.8	1017	0
05/03	2015	0.333	134.1	23.02	19.69	85.7	1017	0
05/03	2030	0.183	108.6	68.82	19.44	87.8	1017	0
05/03	2045	0.004	161.9	5.09	19.38	89	1017	0
05/03	2100	0.103	300.6	7.74	19.48	89.9	1017	0
05/03	2115	0.45	318.8	8.49	19.46	89.5	1018	0
05/03	2130	0.902	308.4	5.992	19.52	88.5	1018	0
05/03	2145	0.662	283.4	13.52	19.38	89.6	1018	0
05/03	2200	0.422	289.2	22.07	19.26	91.1	1018	0
05/03	2215	0.216	280.2	27.08	19.25	92.1	1018	0
05/03	2230	0	206.1	7.52	18.96	93.2	1018	0
05/03	2245	0	243.8	26.91	18.68	94.9	1018	0
05/03	2300	0.136	324.8	10.09	18.75	96	1018	0
05/03	2315	0.499	331.1	12.89	19.04	94.6	1018	0
05/03	2330	0.516	354.4	17.95	19.3	91.1	1018	0
05/03	2345	0.554	336.8	10.06	19.34	90.8	1018	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/04	0	0.702	346.7	15.76	19.56	86.6	1018	0
05/04	15	0.945	342.9	15.29	20.17	80.7	1018	0
05/04	30	1.236	357.1	15.14	20.88	76.5	1018	0
05/04	45	1.206	353.5	15.83	20.74	75	1018	0
05/04	100	2.676	359.3	13.66	21.18	74.2	1018	0
05/04	115	2.479	356.9	15.99	20.97	72.8	1019	0
05/04	130	1.985	3.374	12.84	20.69	74.3	1018	0
05/04	145	2.156	5.545	13.58	20.6	74.6	1018	0
05/04	200	2.324	9.28	15.04	20.68	73.4	1018	0
05/04	215	2.237	11.8	16.77	20.57	73.1	1018	0
05/04	230	2.351	14.68	14.94	20.47	73.3	1018	0
05/04	245	2.53	8.54	15.31	20.36	73.4	1018	0
05/04	300	2.947	8.79	13.01	20.32	72.3	1018	0
05/04	315	3.08	4.013	11.88	20.1	72.5	1018	0
05/04	330	3.124	10.12	16.66	19.92	73.3	1018	0
05/04	345	2.778	23.48	17.91	19.57	75.6	1018	0
05/04	400	2.895	36.04	17.13	19.11	79	1018	0
05/04	415	3.093	39.75	14.17	18.69	79.1	1018	0
05/04	430	2.03	36.71	16.75	18.31	79.9	1018	0
05/04	445	1.888	41.42	13.65	18.08	81.2	1018	0
05/04	500	1.708	48.52	15.78	18	81.9	1018	0
05/04	515	1.363	48.51	16.08	17.93	82.3	1019	0
05/04	530	1.108	52.36	17.72	17.91	82.1	1019	0
05/04	545	1.293	54.52	20.96	17.73	82.5	1019	0
05/04	600	1.541	57.78	18.53	17.73	81	1019	0
[illegible]	615	2.183	44.23	15.73	17.91	77.9	1019	0

001160.0382

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/04	630	1.999	42.71	18.3	17.82	76.6	1020	0
05/04	645	2.128	43.42	15.38	17.83	75.5	1020	0
05/04	700	2.305	46.12	14.99	18	74.2	1020	0
05/04	715	2.247	50.04	13.91	18.15	73.3	1020	0
05/04	730	1.991	58.56	17.86	18.43	72.8	1020	0
05/04	745	2.714	55.57	15.21	18.59	72	1021	0
05/04	800	2.526	55.26	17.25	18.96	72.1	1021	0
05/04	815	2.662	67.18	22.26	19.19	71	1021	0
05/04	830	3.187	57.41	18.99	19.44	69.22	1021	0
05/04	845	3.614	63.96	17.18	19.62	65.93	1021	0
05/04	900	3.671	59.7	18.43	19.91	64.46	1021	0
05/04	915	3.59	61.23	17.81	20.14	63.25	1021	0
05/04	930	3.094	56.39	19.61	20.59	62.23	1022	0
05/04	945	3.488	70.5	17.66	20.94	60.59	1022	0
05/04	1000	3.511	61.64	22.49	21.21	58.42	1022	0
05/04	1015	3.365	77.4	26.17	21.56	57.78	1022	0
05/04	1030	2.979	80.2	18.12	21.88	56.7	1022	0
05/04	1045	3.421	79	18.4	22.02	55.01	1022	0
05/04	1100	3.302	78.3	23.58	22.25	53.73	1022	0
05/04	1115	2.855	81.8	22.34	22.78	54.35	1022	0
05/04	1130	3.946	108.1	17.81	22.28	55.64	1022	0
05/04	1145	3.423	102.2	21.04	22.61	55.72	1022	0
05/04	1200	3.254	98.9	24.5	22.88	54.65	1022	0
05/04	1215	3.566	97.1	23.24	22.77	54.11	1022	0
05/04	1230	3.424	108.5	20.53	22.78	53.78	1022	0
05/04	1245	3.266	95.7	23.27	22.88	52.94	1022	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/04	1300	2.539	96.5	22.57	23.31	51.16	1022	0
05/04	1315	2.763	98.1	16.19	23.05	50.42	1022	0
05/04	1330	2.608	109.8	28.86	23.43	49.68	1022	0
05/04	1345	2.632	102.5	22.4	23.39	49.32	1022	0
05/04	1400	2.586	112.1	22.47	23.82	48.59	1021	0
05/04	1415	2.356	104.8	28.26	23.87	47.54	1021	0
05/04	1430	1.948	101	25.89	24.09	46.96	1021	0
05/04	1445	1.866	88.9	35.32	24.64	46.58	1021	0
05/04	1500	1.914	95.5	26.03	24.39	44.69	1021	0
05/04	1515	1.694	114.1	42.36	24.95	43.71	1021	0
05/04	1530	2.071	86.5	32.11	24.77	43.46	1020	0
05/04	1545	2.506	98.6	31.12	24.72	42.83	1020	0
05/04	1600	1.872	120.5	29.12	25.02	41.74	1020	0
05/04	1615	1.728	67.1	39.71	25.27	41.17	1020	0
05/04	1630	1.413	91.3	34.3	25.48	40.65	1020	0
05/04	1645	1.936	75.9	20.05	25.5	40.7	1020	0
05/04	1700	1.758	82.4	27.62	25.26	40.63	1020	0
05/04	1715	1.787	105.9	33.58	25.2	40.52	1020	0
05/04	1730	1.665	94.6	26.36	25.44	40.77	1020	0
05/04	1745	1.776	66.49	25.68	25.24	40.5	1020	0
05/04	1800	1.114	88.5	23.01	25.39	40.23	1020	0
05/04	1815	1.445	25.8	36.03	25.27	41	1020	0
05/04	1830	1.562	43.5	38.38	25.1	41.49	1020	0
05/04	1845	1.271	77.3	23.86	24.79	41.98	1020	0
05/04	1900	0.874	89.1	24.87	24.66	42.83	1020	0
05/04	1915	0.966	93.6	18.4	24.04	45.65	1020	0

001160.0384

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/04	1930	0.948	72.2	20.11	23.64	47.19	1020	0
05/04	1945	0.364	115.6	28.91	22.89	51.23	1020	0
05/04	2000	0.884	128.1	14.99	22.37	52.18	1020	0
05/04	2015	0.851	140.5	17.26	22.15	53.1	1020	0
05/04	2030	0.688	151.3	12.8	21.51	56.71	1020	0
05/04	2045	0.507	138.3	20.22	21.14	59.05	1020	0
05/04	2100	0.534	140	17.34	20.63	62.39	1020	0
05/04	2115	0.229	152.7	25.61	20.13	66.53	1020	0
05/04	2130	0.319	147.1	23.35	19.56	70.4	1020	0
05/04	2145	0.298	149.2	16.54	19.28	73.2	1021	0
05/04	2200	0.25	141.7	23.64	19.01	75.2	1021	0
05/04	2215	0.242	156.1	9	18.8	77.6	1021	0
05/04	2230	0.388	155.8	15.82	18.65	79.1	1021	0
05/04	2245	0.217	151.1	12.61	18.41	81	1021	0
05/04	2300	0.186	148.9	11.86	18.14	83.1	1021	0
05/04	2315	0.115	166.4	14.41	18.09	84.8	1021	0
05/04	2330	0.089	148.8	19.9	17.91	85.8	1021	0
05/04	2345	0.116	157.8	10.5	17.65	87.5	1021	0
05/05	0	0.424	118.2	6.026	17.41	87.6	1020	0
05/05	15	0.193	158.7	41.53	17.35	88.4	1020	0
05/05	30	0.047	170.2	10.77	17.1	89.3	1020	0
05/05	45	0.273	132.3	16.19	16.91	90.2	1020	0
05/05	100	0.034	155.5	3.524	16.84	91	1020	0
05/05	115	0.104	162.9	38.7	16.55	92.3	1020	0
05/05	130	0.01	123.2	0	16.37	93.9	1020	0
05/05	145	0.021	126.4	6.432	16.28	94.7	1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/05	200	0.059	144.2	0	16.35	95.1	1020	0
05/05	215	0.125	165.8	14.15	16.31	95.1	1019	0
05/05	230	0.349	183.4	8.37	16.25	94.6	1019	0
05/05	245	0.434	181.1	4.164	16.16	94.6	1019	0
05/05	300	0.248	170.2	6.026	16.03	94.2	1019	0
05/05	315	0.295	193	15.48	15.82	94.8	1019	0
05/05	330	0.196	208.1	0.867	15.52	95.5	1019	0
05/05	345	0	207.5	0.465	15.26	97	1019	0
05/05	400	0	207.6	0.462	15.28	98.4	1019	0
05/05	415	0	207.5	0.464	15.01	99.2	1020	0
05/05	430	0	207.5	0.463	14.85	100.3	1020	0
05/05	445	0.001	218.9	14.66	14.81	101.2	1020	0
05/05	500	0	210.2	23.04	14.9	101.8	1020	0
05/05	515	0.126	86.3	3.826	14.89	102.4	1020	0
05/05	530	0	85.8	0.04	14.68	102.6	1020	0
05/05	545	0	85.8	0.048	14.44	102.8	1020	0
05/05	600	0	85.8	0	14.27	103.2	1020	0
05/05	615	0	85.8	0.048	14.26	103.4	1020	0
05/05	630	0	85.9	0	14.23	103.6	1021	0
05/05	645	0	86.2	0.366	14.67	103.8	1021	0
05/05	700	0	86.7	0.048	15.32	104.1	1021	0
05/05	715	0	86.4	0.252	16.15	103.8	1021	0
05/05	730	0.013	109	6.87	18.03	101.5	1021	0
05/05	745	0.108	34.99	44.08	20.41	91	1021	0
05/05	800	0.362	8.95	8.97	21.4	79	1021	0
05/05	815	0.674	54.72	23.04	22.09	72.6	1021	0

001160.0386

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/05	830	1.162	73.8	13.19	22.65	65.79	1021	0
05/05	845	1.387	84.3	16.25	23.03	61.44	1021	0
05/05	900	1.697	105.4	21.34	23.2	59.34	1022	0
05/05	915	1.732	92.8	21.86	23.56	55.61	1022	0
05/05	930	1.876	92.1	19.11	23.75	54.07	1021	0
05/05	945	2.358	76.2	17.72	24.13	52.69	1021	0
05/05	1000	2.733	71.7	16.49	24.43	53.82	1021	0
05/05	1015	2.529	92.3	20.33	24.77	54.25	1021	0
05/05	1030	2.432	103.1	31.14	25.07	54.83	1021	0
05/05	1045	2.411	105.5	27.8	25.38	52.25	1021	0
05/05	1100	2.295	115.2	21.13	25.62	48.42	1021	0
05/05	1115	2.765	125	27.81	25.8	45.28	1021	0
05/05	1130	2.644	125	38.17	26.11	43.67	1021	0
05/05	1145	1.94	156.9	34.77	26.26	43.67	1021	0
05/05	1200	2.11	136.1	32.26	26.2	43.73	1021	0
05/05	1215	2.991	119	28.29	26.03	44.05	1021	0
05/05	1230	2.296	117.3	22.71	26.2	44.64	1021	0
05/05	1245	2.663	120.1	20.42	26.42	44.99	1021	0
05/05	1300	1.958	139.9	34.17	26.94	44.61	1020	0
05/05	1315	2.657	115.2	28.97	26.51	45.66	1020	0
05/05	1330	1.557	121.8	35.6	27.27	46.09	1020	0
05/05	1345	2.849	117.8	18.4	26.79	45.55	1020	0
05/05	1400	2.05	129.4	38.41	27.1	44.53	1020	0
05/05	1415	2.512	136.7	35.35	27.43	43.67	1020	0
05/05	1430	2.283	117.5	27.74	27.22	44.37	1019	0
05/05	1445	2.31	117.2	30.15	27.13	44.31	1019	0

001160.0387

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/05	1500	2.135	105.6	29.24	27.47	44.54	1019	0
05/05	1515	1.993	130.1	28.06	27.33	44.28	1019	0
05/05	1530	3.141	112.8	18.4	27.35	45.26	1019	0
05/05	1545	3.064	115.7	20.53	27.21	45.83	1018	0
05/05	1600	3.209	115.8	17.96	27.21	46.43	1018	0
05/05	1615	3.541	121.3	21.49	27.09	47.2	1018	0
05/05	1630	3.167	122	20.97	26.92	48.12	1018	0
05/05	1645	3.329	117.1	22.12	26.87	48.86	1018	0
05/05	1700	2.791	122.2	22.54	26.85	49.75	1018	0
05/05	1715	2.633	130.3	27.1	26.47	50.73	1018	0
05/05	1730	2.833	126.1	19.19	26.7	50.31	1018	0
05/05	1745	2.36	126.2	27.3	26.7	49.38	1018	0
05/05	1800	1.571	142.3	37.48	26.71	48.53	1018	0
05/05	1815	2.224	121.6	24.17	26.16	50.75	1018	0
05/05	1830	1.373	133	30.31	26.23	49.3	1018	0
05/05	1845	1.389	148.8	35.94	26.01	48.76	1018	0
05/05	1900	1.046	163.4	42.69	25.79	49.06	1018	0
05/05	1915	1.005	157.6	37.04	25.32	49.77	1018	0
05/05	1930	0.954	157.1	33.57	24.76	50.86	1018	0
05/05	1945	0.606	169.6	39.84	24.41	52.11	1018	0
05/05	2000	0.618	156	38.12	24.08	53.11	1018	0
05/05	2015	0.648	180	36.5	23.77	54.53	1018	0
05/05	2030	0.223	163.9	63.88	23.24	57.55	1018	0
05/05	2045	0.72	135.9	32.93	23.14	59.5	1018	0
05/05	2100	0.909	125.2	15.52	22.97	60.91	1018	0
05/05	2115	0.865	135.5	14.52	22.8	62.24	1018	0

001160.0388

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/05	2130	0.532	143.2	23.25	22.54	63.81	1019	0
05/05	2145	0.297	138.9	39.27	21.79	67.5	1019	0
05/05	2200	0.471	129.8	27.47	21.44	71.3	1019	0
05/05	2215	0.587	130.6	23.99	21.77	72.1	1019	0
05/05	2230	0.748	128.6	16.04	21.78	73	1019	0
05/05	2245	0.641	129.1	25.47	21.75	74.5	1019	0
05/05	2300	0.776	132.9	27.63	21.71	75.7	1019	0
05/05	2315	0.69	138.3	25.83	21.63	76.9	1019	0
05/05	2330	0.301	142.2	30.24	21.2	78.8	1019	0
05/05	2345	0.36	119.8	9.14	20.32	83.7	1019	0
05/06	0	0.202	130.7	13.16	19.68	89.5	1019	0
05/06	15	0.276	133.2	6.816	19.41	93.2	1018	0
05/06	30	0.58	123.4	10.02	19.18	95.8	1018	0
05/06	45	0.227	133.1	12.49	19.12	97	1018	0
05/06	100	0.019	149.3	5.652	19.02	97.4	1018	0
05/06	115	0.074	149	2.97	18.74	98.6	1018	0
05/06	130	0.314	138.6	6.896	18.71	100.2	1018	0
05/06	145	0.154	126.5	16.29	18.71	101.2	1018	0
05/06	200	0.092	174.1	9.4	18.74	101.4	1018	0
05/06	215	0.05	142	7.2	18.61	101.8	1018	0
05/06	230	0.299	111.4	6.321	18.62	102.5	1018	0
05/06	245	0.031	110	0	18.46	102.9	1018	0
05/06	300	0.156	113.1	3.821	18.57	103.2	1018	0
05/06	315	0.428	122	3.119	18.6	103.5	1017	0
05/06	330	0.167	131.5	1.249	18.74	103.8	1017	0
05/06	345	0.224	135.8	7.27	18.63	104	1017	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/06	400	0	141.5	0	18.55	104.1	1017	0
05/06	415	0.107	143.5	0.572	18.4	104.1	1017	0
05/06	430	0	142.6	0	18.47	104.3	1017	0
05/06	445	0	142.8	0	18.63	104.5	1017	0
05/06	500	0.027	142.2	0	18.42	104.7	1018	0
05/06	515	0.349	142	0	18.67	104.8	1017	0
05/06	530	0.316	138.9	3.582	18.76	104.9	1017	0
05/06	545	0.161	134.4	0.165	18.77	105	1017	0
05/06	600	0.031	135.8	0	18.63	105.1	1018	0
05/06	615	0.314	142.9	3.131	18.55	105.1	1017	0
05/06	630	0.146	146.1	0	18.66	105.2	1018	0
05/06	645	0.099	140.8	5.065	18.76	105.2	1018	0
05/06	700	0.061	134	0	19.23	105.3	1018	0
05/06	715	0.08	133.4	2.211	19.85	105.3	1018	0
05/06	730	0.125	138.7	4.897	20.8	105.2	1018	0
05/06	745	0.262	139.7	28.21	21.55	104.6	1018	0
05/06	800	0.467	130.7	18.76	22.4	101.2	1018	0
05/06	815	0.713	162.1	32.91	23.31	94.8	1019	0
05/06	830	0.88	177.4	43.32	24.26	89.1	1019	0
05/06	845	1.211	165.9	28.94	24.62	85.2	1019	0
05/06	900	1.286	155.4	43.62	25.03	82.2	1018	0
05/06	915	1.272	179.8	40.85	25.17	79.9	1018	0
05/06	930	1.452	176.1	39.72	25.56	76.9	1018	0
05/06	945	1.317	183.9	41.32	26.21	73.3	1018	0
05/06	1000	1.843	195.4	30.92	26.7	70.1	1018	0
05/06	1015	1.732	208.1	33.23	26.62	68.03	1018	0

001160.0390

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/06	1030	1.502	188.9	42.52	27.46	64.95	1018	0
05/06	1045	1.72	182.8	40.91	27.53	61.99	1017	0
05/06	1100	1.661	169.7	43.39	28.21	59.75	1017	0
05/06	1115	1.693	198.6	36.17	28.6	56.66	1017	0
05/06	1130	2.113	216.3	32.05	28.36	55.23	1017	0
05/06	1145	2.273	216.3	34.43	29.06	52.8	1017	0
05/06	1200	1.653	178.8	40.19	28.21	54.57	1017	0
05/06	1215	2.095	213.1	35.23	28.98	52.35	1017	0
05/06	1230	2.409	224.1	31.97	28.95	50.87	1017	0
05/06	1245	2.153	223.1	21.84	29.14	50.71	1017	0
05/06	1300	2.484	223	25.94	29.02	50.34	1017	0
05/06	1315	2.197	220.8	29.8	29.18	50.53	1016	0
05/06	1330	2.605	214.5	29.16	29.41	50.79	1016	0
05/06	1345	1.92	229.6	35.76	29.77	50.25	1016	0
05/06	1400	1.82	216.8	32.98	29.42	50.48	1016	0
05/06	1415	2.145	188.3	33.18	29.31	50.57	1016	0
05/06	1430	1.806	213.7	43.24	29.62	51.87	1016	0
05/06	1445	1.676	209.4	37.64	29.14	51.76	1015	0
05/06	1500	1.391	208.2	42.3	28.92	53.01	1015	0
05/06	1515	2.39	222.5	31.32	29.06	52.7	1015	0
05/06	1530	1.835	217.5	25.98	28.99	52.94	1015	0
05/06	1545	2.09	225.9	30.51	28.66	53.87	1015	0
05/06	1600	2.544	234.4	21.98	28.37	56.72	1015	0
05/06	1615	2.196	224.2	29.09	28.93	55.59	1014	0
05/06	1630	1.273	227.9	37.62	27.69	60.38	1014	0
05/06	1645	1.752	214	36.8	27.85	60.83	1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/06	1700	2.023	217.8	32.67	28.35	60.29	1014	0
05/06	1715	1.703	195.8	40.37	27.89	62.14	1014	0
05/06	1730	1.587	208.5	34.06	27.86	63.15	1014	0
05/06	1745	1.301	193.9	34.13	27.7	63.36	1014	0
05/06	1800	1.376	214.6	39.98	27.84	63.19	1014	0
05/06	1815	1.968	202.4	28.13	27.71	63.49	1014	0
05/06	1830	1.49	205.4	39.57	27.49	64.61	1014	0
05/06	1845	1.716	208.9	29.61	27.34	65.51	1014	0
05/06	1900	2.031	217.2	22.09	27.29	66.01	1014	0
05/06	1915	2.346	218.8	25.29	27.17	66.46	1014	0
05/06	1930	2.197	210.8	27.28	26.98	67.74	1014	0
05/06	1945	2.557	221.3	23.66	26.76	68.63	1014	0
05/06	2000	2.377	232	20.92	26.6	69.51	1014	0
05/06	2015	1.998	228.5	23.4	26.4	70.8	1014	0
05/06	2030	2.181	232.8	21.3	26.27	71.1	1015	0
05/06	2045	2.109	232.1	22.89	26.16	72.4	1014	0
05/06	2100	1.818	232.6	24.27	26.03	74.1	1015	0
05/06	2115	2.015	227.4	21.25	25.9	75.4	1014	0
05/06	2130	2.011	224.1	22.4	25.85	75.9	1014	0
05/06	2145	2.708	221.4	25.2	25.78	76.7	1014	0
05/06	2200	2.208	232.3	23.04	25.67	77.7	1014	0
05/06	2215	2.602	237.3	24.51	25.58	78.7	1015	0
05/06	2230	2.524	237	19.96	25.46	80	1015	0
05/06	2245	3.343	253.4	17.09	25.37	81.2	1015	0
05/06	2300	2.994	254.6	20.05	25.31	82.3	1016	0
[illegible]	2315	2.574	256.7	16.07	24.99	85.5	1016	0

001160.0392

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/06	2330	2.945	270.8	21.04	24.72	89.6	1016	0
05/06	2345	3.053	294.6	21.42	23.07	86.5	1015	0.01
05/07	0	1.436	237.3	42.91	21.83	86.3	1014	0
05/07	15	1.229	216.9	25.76	21.78	88.1	1014	0
05/07	30	2.132	215.4	30.03	22.74	91.7	1012	0.01
05/07	45	2.298	216.4	37.83	23.76	97.3	1013	0.01
05/07	100	1.662	229.8	32.14	23.84	96.9	1013	0
05/07	115	1.236	247.5	33.7	23.49	90.4	1014	0
05/07	130	0.662	234.8	33.48	23.25	89.6	1014	0
05/07	145	0.674	220.9	32.38	23.1	91.2	1013	0
05/07	200	2.068	244.6	15.24	23.44	90.7	1013	0
05/07	215	2.69	262.6	17.1	24.04	93.6	1013	0
05/07	230	2.751	255.7	17.1	24.32	95	1013	0
05/07	245	2.695	245.6	18.39	24.3	95.2	1013	0
05/07	300	2.555	247.6	17.41	24.28	95	1013	0
05/07	315	2.195	256.4	17.96	24.3	93.7	1013	0
05/07	330	1.546	248.1	14.18	24.3	93.8	1013	0
05/07	345	1.587	243	15.5	24.24	94.3	1013	0
05/07	400	1.533	241.6	16.75	24.25	94.4	1014	0
05/07	415	1.663	249.3	16.05	24.32	93.9	1014	0
05/07	430	1.645	254.9	19.26	24.25	94.2	1014	0
05/07	445	1.154	309	22.23	24.18	95	1014	0
05/07	500	0.926	334.5	12.26	23.87	96.4	1014	0
05/07	515	1.28	0.402	12.28	23.68	96.2	1014	0
05/07	530	1.195	7.29	16.81	23.51	95.1	1014	0
05/07	545	0.399	332.3	53.39	23.42	95.3	1014	0

001160.0393

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/07	600	0.391	210.9	46.29	23.2	98.3	1014	0
05/07	615	0.296	177.5	41.22	23.03	99.9	1014	0
05/07	630	0.518	193.3	30.98	22.89	100.9	1014	0.01
05/07	645	0.368	223.2	22.61	22.85	101.5	1014	0
05/07	700	1.455	222.8	27.37	23.46	101.4	1014	0
05/07	715	1.566	230.1	21.68	23.93	99.4	1014	0
05/07	730	1.514	242.1	21.89	24.11	98.6	1015	0
05/07	745	1.31	255.4	16.58	24.18	98.6	1015	0
05/07	800	1.435	251.6	15.24	24.25	98.3	1015	0
05/07	815	1.299	246.3	22.77	24.34	97.9	1015	0
05/07	830	1.229	236.1	20.36	24.42	98	1015	0
05/07	845	1.724	233.1	26.94	24.58	97.5	1015	0
05/07	900	1.533	233.6	24.8	24.88	96.1	1015	0
05/07	915	1.704	253.8	19.9	25.08	94.9	1016	0
05/07	930	1.313	248.9	23.7	25.12	94.3	1015	0
05/07	945	1.544	235.7	32.27	25.64	92.4	1015	0
05/07	1000	2.319	239.9	26.48	26.41	88	1015	0
05/07	1015	2.875	246.3	17.84	25.98	86.9	1016	0
05/07	1030	2.692	253.6	21.41	26.13	85.5	1016	0
05/07	1045	2.447	244.7	21.5	26.61	83.2	1016	0
05/07	1100	2.388	246.4	20.41	26.86	81.7	1016	0
05/07	1115	3.15	257.2	22.49	27.04	79.7	1016	0
05/07	1130	2.354	257.1	18.59	27.01	79.2	1016	0
05/07	1145	2.271	251.1	19.72	26.3	80.8	1015	0
05/07	1200	1.593	246.1	16.8	25.55	88	1015	0.02
05/07	1215	1.853	263.9	22.21	26.97	87	1015	0

001160.0394

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/07	1230	1.541	255.7	24.24	27	82.2	1015	0
05/07	1245	1.973	255.3	18.37	26.87	80.3	1015	0
05/07	1300	2.125	266.2	22.01	27.49	77.9	1015	0
05/07	1315	2.301	302.4	19.54	27.26	77.4	1015	0
05/07	1330	2.21	325.7	13.45	27.33	78.9	1015	0
05/07	1345	1.945	304.7	22.52	27.94	76.6	1014	0
05/07	1400	1.843	301.4	24.48	28.87	71.7	1014	0
05/07	1415	2.171	292.1	31.51	28.98	68.68	1014	0
05/07	1430	2.369	318	16.88	28.86	67.14	1014	0
05/07	1445	2.079	307	17.61	28.71	66.1	1014	0
05/07	1500	2.29	289.8	20.01	29.16	64.98	1014	0
05/07	1515	2.2	322.1	20.1	28.47	65.61	1014	0
05/07	1530	1.949	330.8	24.73	28.54	66.02	1014	0
05/07	1545	1.471	348.7	41.34	29.12	63.25	1013	0
05/07	1600	1.467	302	21.82	29.92	58.9	1013	0
05/07	1615	1.646	282.2	22.47	30.48	54.81	1013	0
05/07	1630	1.762	297.9	26.54	30.42	52.1	1013	0
05/07	1645	1.96	307	23.81	29.68	53.54	1013	0
05/07	1700	2.001	319	26.02	29.49	55.31	1013	0
05/07	1715	2.357	312.5	15.44	29.56	52.15	1013	0
05/07	1730	1.819	303.7	19.49	29.7	50.87	1013	0
05/07	1745	2.57	290	16.66	29.61	49.94	1013	0
05/07	1800	2.192	304.6	18.02	28.74	52	1013	0
05/07	1815	2.122	313.8	15.09	28.34	54.46	1013	0
05/07	1830	1.926	299.4	16.6	28.38	55.35	1013	0
05/07	1845	1.797	302.7	16.44	28.08	56.46	1013	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/07	1900	1.908	317.1	13.51	27.72	58.4	1013	0
05/07	1915	1.619	316.1	11.5	27.43	59.86	1013	0
05/07	1930	1.293	312.6	11.8	27.16	61.59	1013	0
05/07	1945	1.249	318.5	14.83	27	62.87	1013	0
05/07	2000	0.754	308.6	13.5	26.62	65.3	1013	0
05/07	2015	0.849	313.5	8.46	26.03	68.79	1013	0
05/07	2030	0.263	293.1	8.45	25.7	71.9	1013	0
05/07	2045	0.243	139.3	14.94	24.85	77.8	1013	0
05/07	2100	0	264.2	0.679	24.69	81.1	1014	0
05/07	2115	0.094	206.3	5.194	24.7	82.5	1014	0
05/07	2130	0	185.9	9.64	24.6	83.4	1014	0
05/07	2145	0	175.4	0.796	24.54	84.3	1014	0
05/07	2200	0.074	176.7	0.122	24.35	85.8	1014	0
05/07	2215	0.616	239	21.81	24.69	85.9	1014	0
05/07	2230	1.539	238.6	16.16	26.06	83.1	1014	0
05/07	2245	1.433	246.1	18.85	26.12	82.6	1014	0
05/07	2300	1.61	249.9	17.83	25.94	83.7	1014	0
05/07	2315	1.355	235.5	15.85	25.76	85.1	1014	0
05/07	2330	1.614	243.6	18.57	25.61	86.3	1014	0
05/07	2345	2.274	251.4	13.47	25.57	87.1	1015	0
05/08	0	2.512	259.1	18.93	25.63	86.8	1015	0
05/08	15	2.34	253.9	17.77	25.58	86.6	1015	0
05/08	30	2.143	244.3	17.5	25.39	87.3	1014	0
05/08	45	1.739	234.1	21.11	25.2	88.4	1014	0
05/08	100	1.831	248.1	15.58	25.06	89.4	1014	0
05/08	115	1.36	238.2	20.35	24.88	90.9	1014	0

001160.0396

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/08	130	1.309	245.1	19.39	24.82	92.1	1014	0
05/08	145	0.771	240.7	17.13	24.71	92.9	1014	0
05/08	200	1.112	244.3	16.2	24.58	94.2	1014	0
05/08	215	1.256	250.6	17.56	24.54	95.1	1014	0
05/08	230	1.715	254.8	13.04	24.52	95.8	1014	0
05/08	245	1.219	249	16.18	24.56	96.1	1013	0
05/08	300	1.375	248.6	17.16	24.65	96	1013	0
05/08	315	1.233	240.9	14.41	24.58	96.2	1013	0
05/08	330	1.304	242	14.78	24.42	97.2	1013	0
05/08	345	1.261	243.9	19.96	24.31	98.2	1014	0
05/08	400	1.185	247.9	16.49	24.21	98.9	1014	0
05/08	415	1.292	249.3	15.12	24.25	99.6	1014	0
05/08	430	1.38	263.5	13.51	24.35	99.6	1014	0
05/08	445	1.122	272.6	13.93	24.29	99.8	1014	0
05/08	500	1.664	260.7	16.73	24.25	100.1	1014	0
05/08	515	1.336	254.3	14.09	24.13	100.3	1014	0
05/08	530	1.381	263	19.02	24.15	100.8	1015	0
05/08	545	1.207	254.1	16.1	24.26	100.5	1015	0
05/08	600	1.062	263.9	14.16	24.28	100.5	1015	0
05/08	615	0.989	263.6	13.63	24.18	100.5	1015	0
05/08	630	1.221	277.3	15.72	24.26	100.8	1015	0
05/08	645	1.52	278.1	18.15	24.36	99.9	1016	0
05/08	700	1.84	279.6	16.3	24.46	98.9	1016	0
05/08	715	1.741	265.3	16.44	24.62	98.2	1016	0
05/08	730	1.473	264.9	20.27	24.84	97.3	1016	0
05/08	745	1.056	270.8	24.57	25.14	95.9	1016	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/08	800	1.095	290.9	18.94	25.42	94.1	1016	0
05/08	815	1.208	284.8	18.94	25.76	91.9	1016	0
05/08	830	1.524	277.9	12.85	25.95	89.8	1016	0
05/08	845	1.723	295.5	19.26	26.23	88.3	1016	0
05/08	900	1.907	301.1	20.39	26.51	86.3	1016	0
05/08	915	2.194	286.3	14.75	26.89	82.9	1016	0
05/08	930	2.457	298.9	17.41	26.98	80.8	1016	0
05/08	945	2.418	303.8	20.46	27.11	79.2	1016	0
05/08	1000	2.184	296	20.02	27.7	76.7	1017	0
05/08	1015	2.288	298.6	21.37	27.75	75.4	1017	0
05/08	1030	2.754	310.1	19.93	27.61	74.8	1017	0
05/08	1045	2.27	297	21.71	28.01	72.9	1017	0
05/08	1100	2.026	297.5	20.63	28.67	70.6	1017	0
05/08	1115	1.56	294.4	35.19	29.06	67.5	1017	0
05/08	1130	1.504	310.6	29.21	28.98	68.12	1017	0
05/08	1145	1.465	255.8	36	29.36	66.26	1017	0
05/08	1200	1.578	268.7	36.2	30.17	62.81	1016	0
05/08	1215	1.403	244	33.15	29.84	60.91	1016	0
05/08	1230	1.463	271.1	38.75	30.45	58.47	1016	0
05/08	1245	1.81	280.9	35.68	29.82	62.07	1016	0
05/08	1300	1.873	262.5	30.73	29.77	60.36	1016	0
05/08	1315	1.168	242.7	45.61	30.36	57.96	1015	0
05/08	1330	1.283	77.7	58.95	29.36	61.6	1015	0
05/08	1345	1.134	357.6	60.95	29.43	62.23	1015	0
05/08	1400	1.662	316.4	44.96	29.71	62.7	1015	0
05/08	1415	1.476	358.8	29.37	29.34	65.11	1014	0

001160.0398

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/08	1430	1.316	9.23	51.2	29.44	65.25	1014	0
05/08	1445	1.264	166.3	54.5	30.02	61.11	1014	0
05/08	1500	1.127	175.7	37.75	30.25	55.36	1014	0
05/08	1515	1.786	225.7	24.48	30.14	56.66	1014	0
05/08	1530	1.904	234.2	24.23	30.41	57.17	1014	0
05/08	1545	1.536	260.8	33.73	30.17	57.42	1014	0
05/08	1600	1.513	308.7	26.88	28.74	64.84	1014	0
05/08	1615	2.037	285.9	24.18	27.29	74.4	1014	0.01
05/08	1630	2.073	236.5	23.65	26.47	87	1014	0.04
05/08	1645	1.131	216.2	41.58	25.52	87.7	1014	0.02
05/08	1700	1.664	122.9	72.5	25.15	89.3	1014	0
05/08	1715	1.624	177.2	48.1	24.25	90.1	1014	0
05/08	1730	1.632	129.7	31.74	22.77	87.7	1014	0
05/08	1745	1.713	132.7	28.02	22.06	92.9	1014	0.04
05/08	1800	2.437	142.4	36.91	21.7	97.3	1014	0.18
05/08	1815	0.908	98.1	57.1	21.3	99.6	1016	0.3
05/08	1830	0.271	353.1	69.86	20.66	100.7	1016	0.24
05/08	1845	1.688	55.59	33.41	20.88	101.9	1015	0.1
05/08	1900	1.606	65.81	35.31	21.53	102.6	1016	0.01
05/08	1915	2.267	61.03	21.11	22.2	102.3	1016	0
05/08	1930	2.205	47.94	17.08	22.25	100.9	1017	0
05/08	1945	1.588	24.97	24.32	22.24	99	1017	0
05/08	2000	1.917	31.53	14.42	22.25	98.5	1017	0
05/08	2015	1.988	37.81	16.47	22.25	97.8	1017	0
05/08	2030	1.882	58.45	12.47	22.18	98.1	1017	0
05/08	2045	2.019	60.02	14.87	22.15	99.4	1016	0

001160.0399

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/08	2100	1.834	72.5	17.28	22.25	100.4	1017	0
05/08	2115	1.758	62.85	18.1	22.31	101.2	1017	0
05/08	2130	1.649	65.68	19.03	22.5	101.6	1017	0
05/08	2145	2.514	75.7	14	22.63	100.7	1017	0.01
05/08	2200	2.073	88.1	13.78	22.36	99.7	1017	0
05/08	2215	1.887	86.4	14.68	22.18	100.3	1017	0
05/08	2230	1.769	83.6	14.01	22.17	100.3	1017	0
05/08	2245	1.823	94.9	15.98	22.43	100.5	1017	0
05/08	2300	1.971	109.5	15.59	22.81	96.9	1017	0
05/08	2315	1.681	113.5	13.83	22.66	96.6	1017	0
05/08	2330	1.341	118.8	14.63	22.46	96.4	1017	0
05/08	2345	1.218	134.3	17.08	22.2	95.9	1017	0
05/09	0	0.46	176.6	32.5	21.95	97	1017	0
05/09	15	0.763	158.7	31.28	21.77	98.8	1017	0
05/09	30	0.96	145.1	26.54	21.84	99.4	1017	0
05/09	45	0.893	143.7	20.47	21.92	99.8	1017	0
05/09	100	0.901	124.7	25.09	21.97	100.4	1017	0
05/09	115	0.547	136.9	27	22.01	100.8	1017	0
05/09	130	0.125	139.3	3.184	21.75	101.5	1017	0
05/09	145	0.072	297.6	37.81	21.6	102.3	1017	0
05/09	200	0.208	142.6	46.83	21.59	103.1	1016	0
05/09	215	0.032	151.1	22.08	21.57	103.4	1016	0
05/09	230	0.162	143.8	34.68	21.46	103.8	1016	0
05/09	245	0.257	295.7	28.37	21.36	103.9	1016	0
05/09	300	0.133	326.3	0.844	21.38	104.1	1016	0
05/09	315	0.535	292.3	25.01	21.25	104.2	1016	0

001160.0400

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/09	330	0.98	319.5	9.94	21.55	104.4	1016	0
05/09	345	0.584	315.5	13.32	21.63	104.5	1016	0
05/09	400	0.495	342.1	14.4	21.53	104.5	1017	0
05/09	415	0.34	231.3	53.98	21.45	104.7	1016	0
05/09	430	0.568	206.8	16.52	21.27	104.7	1016	0
05/09	445	0.348	2.206	22.32	21.26	104.8	1016	0
05/09	500	0.217	148.3	45.69	21.13	104.9	1016	0
05/09	515	0.165	251.3	2.292	20.94	105	1016	0
05/09	530	0.608	313.3	6.324	21.26	105	1017	0
05/09	545	0.703	328.1	15.03	22	105.1	1017	0
05/09	600	0.839	323.2	9.44	22.26	105.1	1017	0
05/09	615	0.867	324.1	17.58	22.53	105.1	1017	0
05/09	630	0.409	309.7	29.13	22.75	105	1018	0
05/09	645	0.435	310.2	15.46	22.87	105	1018	0
05/09	700	0.948	318.2	10.03	23.36	105	1018	0
05/09	715	0.694	319.1	14.65	23.66	104.7	1018	0
05/09	730	1.332	320.4	15.91	23.91	104.1	1018	0
05/09	745	1.371	290.7	15.27	24	103.2	1018	0
05/09	800	0.937	264.6	21.3	24.05	102.9	1018	0
05/09	815	0.696	244.7	14.69	24.27	102.1	1019	0
05/09	830	0.991	265.2	28.75	24.54	101.2	1019	0
05/09	845	1.922	289.7	15.92	24.79	99.5	1019	0
05/09	900	1.627	298	18.82	25.53	95.8	1019	0
05/09	915	1.982	300.5	14.62	25.83	91.7	1019	0
05/09	930	1.616	297	27.24	26.13	88.6	1019	0
05/09	945	1.783	346.1	18.2	25.92	87.5	1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/09	1000	1.777	338.7	20.09	25.96	86.5	1020	0
05/09	1015	1.837	342.9	28.85	26.32	85	1020	0
05/09	1030	2.124	352.2	20.04	26.37	83.2	1020	0
05/09	1045	1.783	337.5	18.92	26.37	81.9	1020	0
05/09	1100	1.765	341.6	19.11	26.26	82.6	1020	0
05/09	1115	1.815	342.7	21.43	26.27	81.5	1020	0
05/09	1130	2.023	341.4	14.6	25.89	83	1020	0
05/09	1145	1.748	358	25.18	25.65	83.6	1020	0
05/09	1200	2.352	350.5	17.07	25.44	83.9	1020	0
05/09	1215	2.113	342.9	20.31	25.57	84.6	1020	0
05/09	1230	2.241	353.9	24.81	25.75	83.8	1020	0
05/09	1245	2.45	354.8	21.21	25.66	83.6	1019	0
05/09	1300	1.8	0.723	20.25	26.38	79.4	1019	0
05/09	1315	2.322	348.5	27.38	27.01	77.6	1019	0
05/09	1330	2.729	346.2	20.1	26.93	78.4	1019	0
05/09	1345	2.469	2.478	19.75	26.96	78.9	1019	0
05/09	1400	2.863	352	23.72	26.83	78.4	1019	0
05/09	1415	2.764	1.875	14.81	27	79.2	1019	0
05/09	1430	2.746	344.8	21.71	27.26	77.8	1019	0
05/09	1445	2.272	7.2	32.3	27.42	74.7	1019	0
05/09	1500	2.857	8.54	18.8	27.54	72.8	1019	0
05/09	1515	3.369	355.4	15.1	27.44	72.8	1019	0
05/09	1530	3.191	8.53	23.76	27.33	72.3	1019	0
05/09	1545	3.039	10.94	13.26	27.43	71	1019	0
05/09	1600	3.22	10.29	17.21	27.46	69.22	1018	0
05/09	1615	2.978	4.052	15.22	27.66	67.68	1018	0

001160.0402

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/09	1630	2.849	358.8	18.13	27.54	67.89	1018	0
05/09	1645	2.694	17.18	22.55	27.59	66.59	1018	0
05/09	1700	2.272	13.52	18.03	27.45	65.8	1018	0
05/09	1715	2.543	3.123	14.5	27.55	66.07	1018	0
05/09	1730	2.681	7.17	15.33	27.42	65.69	1018	0
05/09	1745	2.341	14.5	17.85	27.43	63.75	1018	0
05/09	1800	2.018	7.22	19.49	27.49	63.7	1018	0
05/09	1815	2.212	12.29	20.95	27.32	63.77	1018	0
05/09	1830	2.196	27.68	23.08	27.33	63.06	1018	0
05/09	1845	2.152	45.92	19.47	27.13	64.03	1018	0
05/09	1900	1.582	56.54	19.92	26.9	66.1	1018	0
05/09	1915	1.793	82.3	20.09	26.63	68.11	1018	0
05/09	1930	1.565	87.8	15.2	26.38	70	1018	0
05/09	1945	1.29	82.2	11.49	26.11	71.3	1018	0
05/09	2000	1.284	70.4	15.43	25.96	72.2	1018	0
05/09	2015	1.196	84.2	13.32	25.62	76.8	1018	0
05/09	2030	1.024	97.5	16.18	25.5	79.4	1018	0
05/09	2045	1.104	130.9	17.34	25.45	80.2	1019	0
05/09	2100	0.707	126.9	17.49	25.27	81.1	1019	0
05/09	2115	0.846	126.6	13.97	25.08	82.6	1019	0
05/09	2130	0.762	132.7	8.66	25.09	82.8	1019	0
05/09	2145	0.986	144.7	18.29	24.92	83.8	1019	0
05/09	2200	0.499	140.5	26.76	24.76	85.2	1019	0
05/09	2215	0.441	149.5	27.74	24.48	87.8	1020	0
05/09	2230	0.349	168.1	23.38	24.32	90.2	1019	0
05/09	2245	0.242	140.2	19.96	23.99	92.6	1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/09	2300	0.453	131.7	11.29	23.7	95.5	1020	0
05/09	2315	0.396	139	9.63	23.64	97.6	1020	0
05/09	2330	0.416	159.4	7.25	23.46	98.6	1020	0
05/09	2345	0.038	158	0	23.18	99.6	1020	0
05/10	0	0.088	209.4	4.733	23.12	100.9	1020	0
05/10	15	0.155	209.4	0.529	22.99	101.5	1020	0
05/10	30	0.155	180.8	11.83	22.81	101.9	1020	0
05/10	45	0.197	172.9	14.06	22.78	102.7	1020	0
05/10	100	0.027	186.3	0.792	22.66	103.1	1020	0
05/10	115	0	187	2.477	22.69	103.4	1020	0
05/10	130	0	187.9	0.259	22.67	103.6	1020	0
05/10	145	0	187.9	0.27	22.56	103.8	1019	0
05/10	200	0.055	185.3	0.936	22.61	104.1	1019	0
05/10	215	0.046	188.2	3.437	22.59	104.2	1019	0
05/10	230	0	200.3	0.519	22.5	104.3	1019	0
05/10	245	0	197.6	0.484	22.45	104.4	1019	0
05/10	300	0.059	182.7	6.074	22.41	104.6	1019	0
05/10	315	0.016	304.8	49.27	22.33	104.6	1019	0
05/10	330	0.064	270.9	3.297	22.35	104.6	1019	0
05/10	345	0.054	219.5	7.19	22.29	104.8	1019	0
05/10	400	0.099	209.9	5.125	22.13	104.8	1019	0
05/10	415	0	221.1	0.506	22.18	104.9	1019	0
05/10	430	0.102	211	5.873	22.05	104.9	1019	0
05/10	445	0.097	206.2	0.522	22.01	105	1018	0
05/10	500	0	206.8	0.46	22.08	105.1	1018	0
05/10	515	0.062	206.8	0.458	22.1	105.2	1018	0

001160.0404

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/10	530	0.005	207.1	0.643	22.14	105.3	1019	0
05/10	545	0.011	214.2	10.27	21.97	105.3	1019	0
05/10	600	0	238.5	0.59	21.82	105.3	1019	0
05/10	615	0.31	91.3	52.02	21.95	105.3	1018	0
05/10	630	0.564	96.3	13.15	22.07	105.4	1018	0
05/10	645	0.135	114.1	2.842	22.21	105.4	1019	0
05/10	700	0	114.5	0.557	22.47	105.5	1019	0
05/10	715	0.261	316.1	57.29	22.96	105.4	1019	0
05/10	730	0.338	107	20.88	23.43	105.3	1019	0
05/10	745	0.949	101.2	13.07	23.89	104.6	1019	0
05/10	800	1.075	86.4	8.99	24.43	101.9	1020	0
05/10	815	1.463	85.4	14.84	24.66	98.8	1020	0
05/10	830	1.398	85	17.88	24.97	95.8	1020	0
05/10	845	1.494	86.9	18.45	25.3	93.8	1020	0
05/10	900	1.739	76.9	18.88	25.76	91.3	1020	0
05/10	915	1.83	91.8	16.83	26.2	88.7	1020	0
05/10	930	1.883	91.3	21.49	26.62	85.4	1020	0
05/10	945	2.092	90.7	17	26.48	83.4	1020	0
05/10	1000	1.159	132.1	34.95	26.53	83.5	1020	0
05/10	1015	1.609	131.2	22.82	27.44	75.9	1020	0
05/10	1030	1.431	154.4	34.34	28.16	69.25	1020	0
05/10	1045	1.477	151.1	32.62	28.42	66.91	1020	0
05/10	1100	1.452	152	27.44	28.15	65.51	1020	0
05/10	1115	1.301	120.1	37.83	28.48	64.74	1020	0
05/10	1130	1.364	153.1	43.48	28.92	62.08	1020	0
05/10	1145	1.399	132	39.24	29.6	59.3	1020	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/10	1200	1.693	127.2	38.23	29.65	57.12	1020	0
05/10	1215	1.529	186.1	46.09	30.11	56.18	1020	0
05/10	1230	1.827	172.4	40.35	30.02	56.11	1020	0
05/10	1245	1.396	161.6	43.99	30.05	55.72	1020	0
05/10	1300	1.685	137.6	36.38	30.14	55.08	1019	0
05/10	1315	2.737	104.9	20.33	29.29	61.39	1019	0
05/10	1330	2.413	90.2	22.26	28.4	63.88	1019	0
05/10	1345	2.192	96.9	20.29	28.21	64.62	1019	0
05/10	1400	1.578	86.7	30.93	28.18	65.64	1019	0
05/10	1415	2.04	50.79	23.84	27.62	68.38	1019	0
05/10	1430	1.628	9.67	47.68	27.1	72.4	1019	0
05/10	1445	2.353	359.1	23.56	25.98	81.6	1019	0.03
05/10	1500	2.503	3.167	19.19	24.81	92.6	1019	0.07
05/10	1515	3.191	57.24	19.39	25.74	93.3	1019	0
05/10	1530	3.302	73.1	18.42	25.95	82.4	1018	0
05/10	1545	2.738	77	14.62	26.73	79.3	1018	0
05/10	1600	3.253	89.4	17.36	26.96	79.1	1018	0
05/10	1615	2.995	98.2	14.05	26.18	77.7	1018	0
05/10	1630	2.368	102	14.14	26.13	74.8	1018	0
05/10	1645	1.896	112.2	19.91	26.05	78.6	1018	0
05/10	1700	1.587	130.1	14.68	26.33	78.1	1018	0
05/10	1715	1.774	128.3	16.55	26.57	76.4	1018	0
05/10	1730	1.897	120.8	18.47	26.73	76.7	1018	0
05/10	1745	1.156	142.5	26.94	26.84	77.6	1017	0
05/10	1800	1.156	138.6	25.88	27.24	76.6	1017	0
05/10	1815	1.037	141.5	26.82	27.44	75.2	1017	0

001160.0406

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/10	1830	0.742	158.2	36.17	27.67	74	1017	0
05/10	1845	0.817	147.5	39.6	27.64	72.6	1017	0
05/10	1900	0.852	164.7	45.07	27.14	72.5	1017	0
05/10	1915	0.903	186.7	47.13	26.95	73.2	1017	0
05/10	1930	0.722	197.4	38.18	26.79	73.9	1017	0
05/10	1945	0.712	169.8	31.87	26.55	75.1	1017	0
05/10	2000	0.524	153.2	41.32	26.24	76.8	1017	0
05/10	2015	0.332	156.8	31.53	25.87	78.9	1017	0
05/10	2030	0.321	157.9	25.45	25.39	81.7	1017	0
05/10	2045	0.424	130	14.26	25.09	83.9	1017	0
05/10	2100	0.312	154.8	32.11	24.78	86.4	1017	0
05/10	2115	0.379	132	24.71	24.8	86	1017	0
05/10	2130	0.275	186.4	35.18	24.68	87.6	1017	0
05/10	2145	0.555	124.1	23.6	24.8	87.3	1017	0
05/10	2200	0.297	141.1	32.27	24.58	88.5	1017	0
05/10	2215	0.301	134.1	20.59	24.28	90.6	1018	0
05/10	2230	0.434	120.4	21.76	24.2	91.8	1018	0
05/10	2245	0.608	143.8	24.13	24.48	91	1018	0
05/10	2300	0.112	131.7	31.24	24.11	92.7	1018	0
05/10	2315	0.368	120.1	22.19	23.68	95.5	1017	0
05/10	2330	0.189	145.7	14.24	23.45	97.8	1017	0
05/10	2345	0.144	124.9	32.1	23.22	99.5	1017	0
05/11	0	0.25	138.9	37.97	23.33	100.5	1017	0
05/11	15	0.056	118.9	37.15	23.16	100.9	1017	0
05/11	30	0.186	110	27.28	23.05	101.7	1017	0
05/11	45	0.34	117	13.81	23.06	102.2	1016	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/11	100	0.036	148.6	3.022	22.91	102.5	1017	0
05/11	115	0.436	89.2	6.278	22.76	102.9	1017	0
05/11	130	0.106	164	15	22.74	103.2	1017	0
05/11	145	0.317	126.4	13.48	22.71	103.6	1017	0
05/11	200	0.407	327	30.82	22.5	103.6	1017	0
05/11	215	0.251	69.05	19.95	22.58	103.7	1017	0
05/11	230	0	68.89	0.2	22.6	103.8	1017	0
05/11	245	0.247	278	3.366	22.5	103.9	1017	0
05/11	300	0.352	252.8	6.481	22.48	104	1017	0
05/11	315	0.196	70.4	9.82	22.43	104.2	1017	0
05/11	330	0.122	81.8	0.239	22.49	104.4	1017	0
05/11	345	0	82	0.105	22.28	104.4	1017	0
05/11	400	0	82	0.115	22.08	104.4	1017	0
05/11	415	0	35.91	18.32	22.02	104.6	1017	0
05/11	430	0.345	273.7	11.51	22.08	104.7	1017	0
05/11	445	0.152	259.8	0.391	22.07	104.8	1017	0
05/11	500	0.001	261.3	0.482	21.99	104.8	1017	0
05/11	515	0	261.1	0.329	22.08	104.9	1017	0
05/11	530	0.108	259.9	0.303	22.03	105	1017	0
05/11	545	0.099	258.6	0.77	22.05	105	1017	0
05/11	600	0.223	224.2	10.59	22.1	105.1	1017	0
05/11	615	0.651	246.8	8.53	22.05	105.2	1018	0
05/11	630	0.316	243.9	13.73	22.21	105.3	1018	0
05/11	645	0.374	235.1	3.712	22.27	105.3	1018	0
05/11	700	0	243.4	1.109	22.43	105.3	1018	0
05/11	715	0.374	295.2	30.14	22.95	105.3	1018	0

001160.0408

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/11	730	0.938	291.1	14.93	23.66	105.2	1018	0
05/11	745	0.605	288.5	19.83	24.39	104.1	1018	0
05/11	800	0.995	305.9	13.31	25.36	100.3	1018	0
05/11	815	1.571	312.3	17.18	25.95	94.2	1018	0
05/11	830	1.469	302	19.23	26.4	90.2	1018	0
05/11	845	1.657	324.5	17.3	26.79	86.6	1018	0
05/11	900	1.267	297	21.39	27.23	82.2	1018	0
05/11	915	1.536	317.1	21.54	27.72	78.3	1018	0
05/11	930	1.306	305.6	25.96	27.4	74.9	1018	0
05/11	945	1.386	328	25.9	27.54	75.6	1018	0
05/11	1000	1.258	302.5	19.56	27.99	72.2	1018	0
05/11	1015	1.591	316.8	29.17	27.52	72	1018	0
05/11	1030	1.349	333.2	26.22	26.98	73.6	1018	0
05/11	1045	1.404	18.6	32.63	27.44	72	1018	0
05/11	1100	1.351	356.3	17.59	28.25	71.8	1018	0
05/11	1115	1.918	360	26.86	28	70.5	1018	0
05/11	1130	2.146	329.4	15.73	27.24	72.1	1018	0
05/11	1145	2.295	329.3	15.92	27.21	71.8	1018	0
05/11	1200	2.316	349.5	27.52	28.37	69.81	1018	0
05/11	1215	1.732	357.6	31.14	28.6	68.13	1018	0
05/11	1230	2.257	345.9	20.66	28.27	67.23	1017	0
05/11	1245	2.299	2.881	27.23	28.46	66.11	1017	0
05/11	1300	2.24	352.2	23.11	28.6	65.34	1017	0
05/11	1315	2.277	346.4	21.9	29.08	63.79	1017	0
05/11	1330	2.418	349.7	22.05	28.93	62.87	1017	0
05/11	1345	2.271	358.1	23.7	28.45	62.2	1017	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/11	1400	2.155	325.1	23.93	28.86	61.62	1016	0
05/11	1415	1.897	332.6	21.12	29.47	59.88	1016	0
05/11	1430	1.874	36.01	50.77	29.8	57.63	1016	0
05/11	1445	1.433	69.02	40.02	29.45	57.7	1016	0
05/11	1500	1.61	4.864	23.4	29.32	58.16	1015	0
05/11	1515	1.444	316	31.75	29.25	57.75	1015	0
05/11	1530	1.261	292.7	42.57	30.26	56.36	1015	0
05/11	1545	1.414	15.7	77.8	31.02	53.36	1015	0
05/11	1600	1.658	55.74	30.47	29.59	55.78	1014	0
05/11	1615	1.199	18.34	34.41	29.56	56.4	1014	0
05/11	1630	1.332	333.9	20.26	29.28	57.27	1014	0
05/11	1645	1.399	346.4	22.53	29.25	57.69	1014	0
05/11	1700	1.738	350.9	18.37	29.05	58.16	1014	0
05/11	1715	1.112	27.2	25.38	29.39	57.6	1014	0
05/11	1730	1.765	44.32	22.44	29.42	57.16	1014	0
05/11	1745	1.279	33.82	25.2	29.33	57.34	1014	0
05/11	1800	1.144	301.6	21.62	29.38	58.1	1014	0
05/11	1815	1.229	298.3	22.86	29.32	57.78	1014	0
05/11	1830	1.283	249.3	47.09	29.4	56.61	1014	0
05/11	1845	2.782	223.2	20.95	29.23	55.17	1014	0
05/11	1900	2.253	217.1	24.01	28.93	55.14	1014	0
05/11	1915	1.397	203.2	32.93	28.4	56.29	1014	0
05/11	1930	1.336	181.1	40.23	27.94	58.27	1014	0
05/11	1945	1.053	164.6	38.02	27.48	59.64	1014	0
05/11	2000	1.314	191.8	34.16	27.23	59.74	1014	0
05/11	2015	1.083	192.3	39.11	26.95	60.17	1014	0

001160.0410

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/11	2030	0.99	204.3	35.38	26.71	60.43	1014	0
05/11	2045	0.702	188.4	44.62	26.47	60.57	1014	0
05/11	2100	0.485	166.5	36.39	26.14	61.21	1015	0
05/11	2115	0.556	183.2	41.45	25.75	62.71	1015	0
05/11	2130	0.617	161.4	28.79	25.67	63.52	1015	0
05/11	2145	0.473	171	37.64	25.26	65.13	1015	0
05/11	2200	0.225	130.7	42.78	25	66.44	1015	0
05/11	2215	0.336	156.3	39.32	24.65	68.65	1015	0
05/11	2230	0.462	188	22.86	24.54	70.2	1015	0
05/11	2245	0.435	195	24.59	24.49	71.7	1014	0
05/11	2300	0.142	151.6	44.49	24.08	74.5	1014	0
05/11	2315	0.108	171.8	40.27	23.7	77.9	1014	0
05/11	2330	0.299	232.4	29.1	23.52	81.5	1014	0
05/11	2345	0.48	207.8	38.68	23.93	81.3	1014	0
05/12	0	0.873	203.1	27.93	24.49	78.9	1014	0
05/12	15	0.904	206.1	25.36	24.63	78.1	1014	0
05/12	30	0.554	196.2	34.5	24.6	78.3	1014	0
05/12	45	0.7	203.3	34.75	24.58	79	1014	0
05/12	100	0.497	207.1	29.73	24.37	80	1014	0
05/12	115	0.163	214	20.25	23.72	83.5	1014	0
05/12	130	0.547	223	21.59	23.24	88.6	1014	0
05/12	145	0.996	245.6	15.56	23.8	89.4	1014	0
05/12	200	1.187	250.8	12.29	24.29	87.3	1014	0
05/12	215	1.128	247.8	14.38	24.12	88.2	1014	0
05/12	230	0.917	243.6	13.41	23.86	89.5	1013	0
05/12	245	0.681	262	8.87	23.27	91.6	1013	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/12	300	0.841	261	7.11	22.82	94.5	1013	0
05/12	315	0.485	250.1	6.305	22.6	97.1	1013	0
05/12	330	0.257	239.5	2.1	22.38	99.3	1013	0
05/12	345	0.358	265.9	18.49	22.17	100.8	1013	0
05/12	400	0.606	259.9	12.46	22.37	101.5	1013	0
05/12	415	0.306	252.2	6.788	22.44	102	1013	0
05/12	430	0.03	214.4	0.501	22.37	102.4	1013	0
05/12	445	0.064	165.4	4.283	22.24	102.7	1013	0
05/12	500	0.141	165.8	0	22.05	103.1	1013	0
05/12	515	0.028	165.6	0	21.78	103.3	1013	0
05/12	530	0	164.3	0.297	21.81	103.6	1013	0
05/12	545	0	164.2	0	21.66	103.8	1013	0
05/12	600	0	164.3	0	21.61	103.9	1014	0
05/12	615	0	165	0	21.65	104.1	1014	0
05/12	630	0.017	215.6	6.834	22.03	104.2	1014	0
05/12	645	0	215.3	0.583	22.33	104.3	1015	0
05/12	700	0.734	290.5	6.278	22.72	104.2	1015	0
05/12	715	0.715	293.3	6.698	23.48	102.4	1015	0
05/12	730	0	278.5	0.652	24.01	100.1	1015	0
05/12	745	0.017	287.8	2.155	24.61	96.6	1015	0
05/12	800	0.252	300.6	19.59	25.41	89.2	1015	0
05/12	815	0.8	313.6	22.89	26.18	84.2	1015	0
05/12	830	1.162	324.3	33.67	26.7	80.8	1015	0
05/12	845	1.205	349.7	29.08	26.94	78.1	1015	0
05/12	900	0.989	331.6	24.89	27.4	74	1016	0
[illegible]	915	0.823	320.7	33.05	27.02	73.3	1016	0

001160.0412

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/12	930	0.902	333.8	23	26.99	73.5	1016	0
05/12	945	2.023	31.63	30.45	27.06	73.1	1016	0
05/12	1000	0.876	36.34	52.19	26.82	73.4	1015	0
05/12	1015	1.496	320.8	18.02	26.82	73	1016	0
05/12	1030	0.914	2.406	31	27.09	72.5	1015	0
05/12	1045	1.326	54.06	25.24	28.29	68.46	1015	0
05/12	1100	1.897	84	26.43	28.32	67.63	1015	0
05/12	1115	2.234	91.7	18	28.14	68.15	1015	0
05/12	1130	2.538	92.4	24.17	28.54	67.12	1015	0
05/12	1145	2.712	90.9	17.74	28.6	67.07	1015	0
05/12	1200	2.629	88.5	21.49	28.93	66.39	1015	0
05/12	1215	2.227	84.5	29.69	28.86	64.84	1014	0
05/12	1230	2.377	94	22.76	28.75	64.37	1014	0
05/12	1245	2.196	98.2	29.56	29.06	63.35	1014	0
05/12	1300	2.123	94.6	22.85	29.32	62.31	1014	0
05/12	1315	2.149	123.8	21.87	29.99	57.72	1014	0
05/12	1330	2.286	113.4	25.85	30.11	57.17	1014	0
05/12	1345	2.107	116.3	28.15	30.32	55.73	1014	0
05/12	1400	2.634	118.4	21.91	30.57	54.84	1014	0
05/12	1415	2.698	118.5	20.9	30.47	54.98	1014	0
05/12	1430	2.996	114.4	18.47	30.34	55.88	1013	0
05/12	1445	2.878	124.4	24.5	30.34	55.88	1013	0
05/12	1500	3.463	116.4	24.47	30.55	55.65	1013	0
05/12	1515	2.733	125.1	23.85	29.71	57.63	1012	0
05/12	1530	3.014	124	24.7	29.12	59.62	1012	0
05/12	1545	2.814	124.3	24.34	29.54	60	1012	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/12	1600	2.367	131.1	29.72	29.51	58.84	1012	0
05/12	1615	2.342	126.1	23.53	29.99	57.13	1012	0
05/12	1630	2.791	134.5	28.36	30.23	55.52	1012	0
05/12	1645	2.032	150.5	41.53	30.16	54.84	1012	0
05/12	1700	1.804	147.1	44.59	30.29	53.87	1012	0
05/12	1715	2.194	142.3	33.72	29.8	53.76	1011	0
05/12	1730	1.845	161.5	39.39	29.46	52.69	1011	0
05/12	1745	1.901	142.9	33.65	29.34	53.21	1011	0
05/12	1800	1.847	146.7	37.14	29.57	53.72	1011	0
05/12	1815	2.014	142.7	30.51	29.17	55.71	1011	0
05/12	1830	2.129	157.1	32.39	28.85	54.89	1011	0
05/12	1845	1.34	160.4	46.43	28.71	55.95	1011	0
05/12	1900	1.719	139.5	32.55	28.37	57.91	1012	0
05/12	1915	1.303	137.4	32.8	28.01	59.1	1012	0
05/12	1930	1.148	164.9	45.43	27.73	60.72	1012	0
05/12	1945	1.237	155.2	33.4	27.47	62.03	1012	0
05/12	2000	1.267	141.3	33.28	27.26	63.26	1012	0
05/12	2015	1.127	148.4	33.13	27.05	64.04	1012	0
05/12	2030	1.144	135.7	35.14	26.86	65.31	1012	0
05/12	2045	1.548	129.5	18.35	26.66	67.01	1012	0
05/12	2100	1.297	138.3	22.15	26.31	69.57	1012	0
05/12	2115	1.458	135.6	25.32	26.01	73.1	1012	0
05/12	2130	1.378	129.2	24.5	25.87	76.4	1013	0
05/12	2145	1.39	130.5	23.17	25.9	78.2	1013	0
05/12	2200	1.193	129.6	20.73	25.8	80	1013	0
05/12	2215	1.142	133.4	22.11	25.75	81.3	1013	0

001160.0414

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/12	2230	1.209	131.2	15.82	25.72	82	1013	0
05/12	2245	1.241	130.7	18.02	25.64	82.4	1013	0
05/12	2300	1.276	136.2	20.4	25.62	82.2	1013	0
05/12	2315	1.114	133.3	20.69	25.49	82.8	1013	0
05/12	2330	1.334	128	18.24	25.33	83.6	1013	0
05/12	2345	1.374	128.3	16.45	25.28	84	1013	0
05/13	0	1.396	138.1	22.2	25.14	85.1	1013	0
05/13	15	1.363	129.9	21.31	25.1	86	1013	0
05/13	30	1.454	130.3	21.21	25.16	86.2	1013	0
05/13	45	1.117	147.1	27.43	25.13	86.6	1013	0
05/13	100	0.836	131.5	24.13	24.99	87.4	1013	0
05/13	115	0.871	136.5	19.96	24.94	88.2	1013	0
05/13	130	0.875	137.5	23.73	24.91	89.1	1013	0
05/13	145	0.485	145.6	19.62	24.99	89.2	1013	0
05/13	200	0.838	204.4	34.09	25.04	89.3	1013	0
05/13	215	0.575	154.8	38.2	24.99	90	1012	0
05/13	230	0.436	181.7	35.98	24.93	90.7	1012	0
05/13	245	0.294	145.8	38.09	24.65	91.7	1013	0
05/13	300	0.638	133.5	25.34	24.56	92.6	1013	0
05/13	315	0.675	133.4	14.1	24.55	93	1013	0
05/13	330	0.6	129.2	13.08	24.38	94.2	1013	0
05/13	345	0.663	130.7	17.66	24.31	95.3	1013	0
05/13	400	0.122	164.3	38.35	24.12	96.4	1013	0
05/13	415	0.133	156.4	21.03	23.8	97.9	1013	0
05/13	430	0.286	128.7	21.38	23.74	99.2	1013	0
05/13	445	0.564	116.7	14.19	23.69	99.9	1013	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/13	500	0.464	236.6	48.5	23.78	100.5	1013	0.02
05/13	515	1.207	197.7	44.55	23.76	100.8	1013	0.08
05/13	530	0.703	156.7	40.8	23.13	99.5	1012	0.06
05/13	545	0.657	132.4	38.73	23.01	100.2	1013	0
05/13	600	0.108	199.1	35.04	22.87	101.3	1013	0
05/13	615	0.353	104.4	13.14	22.85	102.3	1013	0
05/13	630	0.351	111.3	6.932	22.86	103	1013	0
05/13	645	0.064	110.6	7.3	22.97	103.4	1013	0
05/13	700	0.632	110	4.507	23.09	103.9	1013	0
05/13	715	0.573	119.5	13.22	23.27	104.1	1013	0
05/13	730	0.774	127.4	9.75	23.47	104.1	1014	0
05/13	745	0.528	125.2	18.4	23.85	103.8	1014	0
05/13	800	0.681	137.2	21.96	24.32	102.6	1014	0
05/13	815	0.952	131.1	20.44	25.08	100.2	1014	0
05/13	830	0.9	198.7	28.17	25.49	97.5	1014	0
05/13	845	0.623	138.6	36.61	25.15	96.1	1014	0
05/13	900	0.699	170.8	37.66	25.7	93.4	1014	0
05/13	915	0.967	186.7	33.59	26.58	87.8	1014	0
05/13	930	0.811	167.9	33.6	27.28	82.2	1014	0
05/13	945	1.173	153.5	28.44	27.49	75.9	1014	0
05/13	1000	1.157	170.7	43.94	27.65	71.6	1014	0
05/13	1015	1.34	179.1	39.35	27.69	69.03	1014	0
05/13	1030	1.473	163.4	38.92	28.15	66.65	1013	0
05/13	1045	1.534	133	34.38	27.98	65.74	1013	0
05/13	1100	2.135	125.6	21.92	27.94	63.9	1013	0
05/13	1115	1.911	133.9	21.39	28.05	61.98	1013	0

001160.0416

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/13	1130	2.207	133.7	22.99	27.87	61.89	1013	0
05/13	1145	2.597	124.8	20.58	27.82	61.5	1012	0
05/13	1200	2.823	116.1	17.5	28.26	60.49	1012	0
05/13	1215	2.248	127.9	26.26	28.71	58.87	1012	0
05/13	1230	2.354	134.4	25.96	28.83	57.37	1012	0
05/13	1245	2.562	136.5	25.99	29.13	55.93	1012	0
05/13	1300	2.294	139.8	25.78	28.96	52.46	1012	0
05/13	1315	2.048	151.3	32.69	28.97	52.34	1012	0
05/13	1330	1.971	149.1	37.77	29.66	51.79	1012	0
05/13	1345	2.098	149	31.54	29.78	49.84	1012	0
05/13	1400	2.067	150.4	33.91	29.82	48.26	1012	0
05/13	1415	1.351	167.4	42.85	30.35	47.08	1013	0
05/13	1430	1.884	163.5	36.33	30.23	46.02	1013	0
05/13	1445	1.8	170.1	40.72	30.12	47.24	1013	0
05/13	1500	2.765	226.6	27.25	30.26	46.59	1013	0
05/13	1515	1.891	204	40.66	29.99	47.67	1013	0
05/13	1530	1.642	210.9	33.76	29.56	49.18	1013	0
05/13	1545	1.842	189.9	38.86	30.3	49.78	1013	0
05/13	1600	1.866	208.3	29.12	30.52	49.14	1013	0
05/13	1615	1.797	169.6	44.15	30.06	49.87	1013	0
05/13	1630	1.33	161	41.19	29.53	51.92	1013	0
05/13	1645	1.101	181	45.54	30.5	51.65	1013	0
05/13	1700	1.132	201.1	45.87	30.01	51.1	1013	0
05/13	1715	1.56	148.3	35.53	29.3	51.88	1013	0
05/13	1730	1.586	145	40.28	29.19	51.49	1012	0
05/13	1745	1.451	153.4	36.38	28.95	52.62	1012	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/13	1800	2.635	128.9	25	28.48	54.53	1012	0
05/13	1815	1.973	146.1	31.69	28.51	55.15	1012	0
05/13	1830	1.775	139.4	38.33	28.31	56.46	1012	0
05/13	1845	1.465	165.6	53.54	28.13	57.77	1013	0
05/13	1900	1.368	186.6	46.05	27.99	59.64	1013	0
05/13	1915	1.6	167.4	40.62	27.74	62.29	1013	0
05/13	1930	1.293	181.1	40.31	27.6	63.87	1013	0
05/13	1945	1.47	194.1	36.38	27.34	65.09	1013	0
05/13	2000	1.216	188	44.26	27.03	67.04	1013	0
05/13	2015	0.852	184.6	46.77	26.71	69.01	1013	0
05/13	2030	1.06	159.1	36.73	26.53	70.6	1013	0
05/13	2045	0.869	171	37.26	26.31	72.4	1013	0
05/13	2100	0.875	164.2	34.5	26.16	74.2	1013	0
05/13	2115	0.621	143.8	43.41	25.92	75.9	1013	0
05/13	2130	0.461	150.2	49.57	25.79	77	1014	0
05/13	2145	0.692	146.2	27.2	25.62	77.9	1014	0
05/13	2200	0.505	133.8	25.05	25.34	79.8	1014	0
05/13	2215	0.372	146.4	23.35	25.13	81.7	1014	0
05/13	2230	0.25	144.6	28.21	24.68	84.7	1014	0
05/13	2245	0.387	139.5	21.35	24.19	89.1	1014	0
05/13	2300	0.262	140	12.13	24.03	91.8	1014	0
05/13	2315	0.352	177.7	28.06	24.02	93.2	1014	0
05/13	2330	0.174	167.6	33.08	23.98	94	1014	0
05/13	2345	0.522	130.6	28.43	24.11	94.2	1014	0
05/14	0	1.037	142.3	28.39	24.62	92.5	1014	0
05/14	15	0.647	159.4	31.25	24.74	91.6	1014	0

001160.0418

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/14	30	0.467	160.9	35.01	24.54	91.9	1014	0
05/14	45	0.735	132.2	27.82	24.54	92.2	1014	0
05/14	100	0.374	155.9	41.65	24.43	92.6	1014	0
05/14	115	0.483	174	35.39	24.42	93	1013	0
05/14	130	0.499	167.5	41.12	24.45	93.1	1013	0
05/14	145	0.353	173.2	56.18	24.31	94.1	1013	0
05/14	200	0.395	152.2	32.42	24.15	95.3	1013	0
05/14	215	0.357	143.1	26.34	24.09	96.3	1013	0
05/14	230	0.38	118.8	20.05	23.83	97.4	1013	0
05/14	245	0.389	143.3	20.27	23.66	98.6	1013	0
05/14	300	0.289	120.6	12.66	23.24	99.8	1013	0
05/14	315	0.17	16.16	8.32	22.98	100.9	1013	0
05/14	330	0.151	35.3	1.997	22.95	101.9	1014	0
05/14	345	0.17	119	34.38	22.86	102.6	1014	0
05/14	400	0.565	137.6	11.88	22.85	103.1	1013	0
05/14	415	0.269	127.5	3.168	22.8	103.5	1014	0
05/14	430	0.132	168.4	5.217	22.69	103.8	1014	0
05/14	445	0.479	133.8	17.48	22.69	104.1	1014	0
05/14	500	0.076	129.5	1.676	22.56	104.2	1014	0
05/14	515	0.005	129.2	1.981	22.33	104.3	1014	0
05/14	530	0	123.6	0	22.35	104.4	1014	0
05/14	545	0.166	126.1	0.968	22.42	104.5	1014	0
05/14	600	0.592	121.1	14.01	22.6	104.7	1014	0
05/14	615	0.381	104.8	0.896	22.58	104.8	1014	0
05/14	630	0	106	0	22.43	104.9	1014	0
05/14	645	0.058	142.9	7.21	22.47	104.9	1014	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/14	700	0.155	142.9	1.683	22.84	105	1014	0
05/14	715	0.063	144	8.12	23.85	105	1014	0
05/14	730	0.313	136.3	9.52	24.61	104.7	1015	0
05/14	745	0.374	147	20.19	25.3	103	1015	0
05/14	800	0.836	157	32.28	26.13	97.3	1014	0
05/14	815	0.902	152.2	39.8	26.59	92.6	1015	0
05/14	830	0.916	186	40.8	27.17	88.7	1015	0
05/14	845	1.326	181.6	42.45	27.61	84.3	1015	0
05/14	900	1.193	188	31.61	27.68	80.4	1015	0
05/14	915	1.003	160.9	37.97	27.87	79	1015	0
05/14	930	1.171	191.3	39.39	28.28	74.8	1015	0
05/14	945	1.131	158.2	35.53	28.47	71.4	1015	0
05/14	1000	1.276	204.1	39.47	29.17	66.53	1016	0
05/14	1015	1.093	184.2	35.41	29.64	62.32	1016	0
05/14	1030	1.565	221	27.75	29.82	60.97	1016	0
05/14	1045	1.788	235.1	26.68	29.83	59.03	1016	0
05/14	1100	2.037	250.1	19.62	29.71	58.18	1016	0
05/14	1115	1.608	229.3	32.37	30	55.74	1016	0
05/14	1130	1.176	222.1	42.39	30.58	52.87	1016	0
05/14	1145	1.412	237.5	40.58	31.12	49.14	1016	0
05/14	1200	0.995	207.8	41.24	31.25	48.58	1016	0
05/14	1215	1.311	188.3	42.43	31.32	48	1016	0
05/14	1230	1.451	153.9	32.71	31.12	46.65	1015	0
05/14	1245	2.107	319.5	59.56	30.56	51.81	1016	0
05/14	1300	2.485	351.3	17.25	28.94	63.72	1016	0
05/14	1315	2.361	349	20.91	28.51	66.73	1015	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/14	1330	3.103	347.5	12.97	28.44	68.59	1015	0
05/14	1345	2.828	357.5	14.33	28.44	68.46	1015	0
05/14	1400	1.655	28.7	29.31	28.56	68.1	1015	0
05/14	1415	1.601	14.72	21.69	28.82	68.46	1014	0
05/14	1430	1.566	355.9	31.19	29.83	65.37	1014	0
05/14	1445	1.399	333.3	23.26	29.94	61.93	1014	0
05/14	1500	2.154	339.8	22.84	29.33	61.68	1014	0
05/14	1515	2.344	342	21.96	29.53	62.8	1014	0
05/14	1530	2.743	357.2	17.51	30.08	61.55	1014	0
05/14	1545	2.13	1.311	21.76	29.87	62.19	1014	0
05/14	1600	1.863	15.39	22.48	30	60.95	1014	0
05/14	1615	2.008	1.832	20.73	30.14	59.73	1014	0
05/14	1630	2.079	14.55	25.86	30.05	59.02	1014	0
05/14	1645	2.563	32.05	23.34	29.75	58.97	1014	0
05/14	1700	1.922	12.59	25.04	29.57	58.85	1014	0
05/14	1715	2.053	17.22	20.77	29.71	58.79	1014	0
05/14	1730	2	48.92	30.42	29.66	58.87	1013	0
05/14	1745	2.003	72	16.16	29.63	59.44	1013	0
05/14	1800	1.863	66.69	18.81	29.24	60.99	1013	0
05/14	1815	2.331	91.2	16.15	29.14	61.6	1013	0
05/14	1830	2.735	97.3	14.33	28.67	65.86	1013	0
05/14	1845	2.891	99.9	15.88	27.87	72.1	1013	0
05/14	1900	3.088	112.8	19.1	26.72	77.8	1014	0
05/14	1915	1.87	138	22.74	25.15	85.2	1014	0.01
05/14	1930	1.126	166.4	20.19	24.28	85.2	1013	0
05/14	1945	0.996	179.7	16.07	23.64	90.8	1013	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/14	2000	1.295	170.3	17.78	23.75	96.7	1013	0
05/14	2015	0.453	131.5	12.77	23.92	99.2	1014	0
05/14	2030	0.782	129.7	10.81	24.08	100.7	1014	0
05/14	2045	0.919	128.2	14.19	24.68	99.2	1014	0.01
05/14	2100	0.873	136.9	16.35	24.92	96.7	1014	0
05/14	2115	0.754	143.7	13.57	24.87	95.9	1014	0
05/14	2130	0.796	130.5	15.24	24.54	96.6	1014	0
05/14	2145	0.831	129.2	17.09	24.57	94	1014	0
05/14	2200	0.886	140.2	13.7	24.39	95	1014	0
05/14	2215	0.6	142	10.85	24.41	95.1	1014	0
05/14	2230	0.748	134.3	13.84	24.14	97.1	1014	0
05/14	2245	0.61	153.3	20.28	24.35	96.4	1014	0
05/14	2300	0.485	152.4	20.09	24.1	97.6	1014	0
05/14	2315	0.211	133.8	20.66	23.96	98.4	1015	0
05/14	2330	0.396	133.7	17.37	23.8	100	1014	0
05/14	2345	0.614	130.4	15.28	23.75	100.7	1014	0
05/15	0	0.463	152.3	20.42	23.89	100.8	1014	0
05/15	15	0.366	146.5	18.04	23.8	100.6	1014	0
05/15	30	0.277	166.5	19.68	23.9	100.4	1014	0
05/15	45	0.375	128.7	5.972	23.71	101.1	1014	0
05/15	100	0.301	140.9	12.69	23.7	101.6	1014	0
05/15	115	0.066	133.5	6.421	23.77	102	1014	0
05/15	130	0.023	164.4	0.389	23.76	102.3	1014	0
05/15	145	0.18	159.6	5.129	23.79	102.7	1014	0
05/15	200	0.328	182.3	12.2	23.82	103	1014	0
05/15	215	0.27	131.1	8.41	23.81	103.2	1014	0

001160.0422

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/15	230	0.478	137.1	9.69	23.84	103.4	1014	0
05/15	245	0.074	121.6	9.59	23.85	103.5	1014	0
05/15	300	0.132	147.7	14.18	23.8	103.6	1014	0
05/15	315	0.33	146.9	14.65	23.53	103.8	1014	0
05/15	330	0.1	152.3	13.57	23.22	103.8	1014	0
05/15	345	0.155	176.7	19.02	23.36	104	1014	0
05/15	400	0	211	8.16	23.17	104	1014	0
05/15	415	0.103	147.2	17.39	23.21	104.2	1014	0
05/15	430	0.152	158.9	9.11	23.21	104.3	1014	0
05/15	445	0	167.3	0	23.17	104.4	1014	0
05/15	500	0.061	124.9	2.308	23.08	104.5	1014	0
05/15	515	0.003	125.2	0	22.98	104.6	1014	0
05/15	530	0	126.7	0	22.93	104.6	1015	0
05/15	545	0	126.7	0	22.87	104.7	1015	0
05/15	600	0	126.7	0	22.88	104.8	1015	0
05/15	615	0	126.7	0	22.6	104.8	1015	0
05/15	630	0.104	144.1	14.85	22.83	104.9	1015	0
05/15	645	0.085	15.3	8.57	22.83	104.9	1015	0
05/15	700	0.001	11.46	0.137	23.31	104.9	1015	0
05/15	715	0	11.46	0.153	24.06	104.9	1015	0
05/15	730	0.191	53.15	25.83	25	104.9	1016	0
05/15	745	0.39	82.7	20.38	25.51	103.8	1016	0
05/15	800	0.923	64.82	14.54	26.21	97.1	1016	0
05/15	815	1.348	62.66	11.66	26.59	92.5	1016	0
05/15	830	1.437	77.7	23.96	27	89.1	1016	0
05/15	845	1.188	90.7	30.13	27.4	86.9	1016	0

Table P-1

METEOROLOGICAL RECORDS COLLECTED AT 15-MINUTE INTERVALS
APRIL 5 TO MAY 15, 1994
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Date	Time	Wind Speed (m/s)	Wind Direction (degrees)	Standard Deviation	Temperature (°C)	Relative Humidity (%)	Barometric Pressure (millibars)	Precipitation (inches)
05/15	900	1.071	108.9	27.67	28.07	80.9	1016	0
05/15	915	1.027	85.7	26.78	28.56	74.8	1016	0
05/15	930	1.504	110	20.74	27.97	73.8	1016	0
05/15	945	1.361	91.4	29.7	27.69	74.5	1016	0
05/15	1000	1.373	73.1	22.89	27.85	73.5	1016	0
05/15	1015	1.802	75.7	25.2	28.18	72.1	1016	0
05/15	1030	1.915	79.2	23.56	28.49	68.7	1016	0
05/15	1045	1.318	108.1	32.7	28.4	67.07	1016	0
05/15	1100	1.272	77.3	25.82	28.4	66.74	1016	0
05/15	1115	1.664	90.5	21.61	28.55	66.02	1016	0
05/15	1130	1.814	76.8	35.06	28.68	65.62	1016	0
05/15	1145	1.711	90.6	19.73	28.93	63.99	1016	0
05/15	1200	1.875	88.9	20.47	29.5	62.15	1016	0
05/15	1215	1.934	84.8	20.8	29.47	61.77	1016	0

Key:

°C = Degrees Celsius
m/s = Meters per second

Source: Ecology and Environment, Inc., 1994

001160.0424

APPENDIX Q

X-RAY FLUORESCENCE DATA

001160.0426

TABLE Q-1
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - UNDEVELOPED LANDFILL GRID SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-001SS-01	AL-GL-002SS-01	AL-GL-003SS-01	AL-GL-004SS-01	AL-GL-005SS-01	AL-GL-006SS-01
Instrument #	Q024	Q028	Q028	Q028	Q028	Q024
Date of Analysis	4-14-94	4-12-94	4-13-94	4-12-94	4-13-94	4-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	317u	317u	317u	317u	282u
Manganese	673u	2740u	2740u	2740u	2740u	771
Iron	10353	26077	40401	41480	103400	29303
Cobalt	628u	745u	745u	745u	2430	628u
Nickel	206u	396u	396u	396u	396u	206u
Copper	101u	97u	620	97u	728	101u
Zinc	237	202	1284	594	2760	1431
Arsenic	68u	77u	77u	77u	223u	68u
Selenium	35u	60u	60u	60u	60u	35u
Strontium	278	199	190	151	223	252
Zirconium	97	197	163	174	247	217
Molybdunum	10u	15u	15u	15u	15u	10u
Mercury	70u	139u	139u	139u	139u	70u
Lead	47	164	398	162	2230	268
Rubidium	23u	74	119	150	97	82

Sample ID	AL-GL-007SS-01	AL-GL-008SS-01	AL-GL-009SS-01	AL-GL-010SS-01	AL-GL-011SS-01	AL-GL-012SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-15-94	4-16-94	4-16-94	4-16-94	4-15-94	4-15-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	282u	419	363	282u	282u
Manganese	673u	3116	3124	3582	1040	7693
Iron	20587	199068	238339	464332	120036	237961
Cobalt	628u	821	1709	628u	944	1354
Nickel	206u	249	206u	206u	206u	206u
Copper	101u	1142	1219	3224	650	2175
Zinc	467	3930	4706	4425	4981	7452
Arsenic	68u	316u	472u	203	216u	417u
Selenium	35u	35u	35u	35u	35u	35u
Strontium	229	299	298	269	236	318
Zirconium	254	152	141	67	142	177
Molybdunum	10u	10u	10u	33	10u	10u
Mercury	70u	70u	70u	270	70u	129
Lead	151	3164	4725	2958	2157	4173
Rubidium	69	81	41	23u	49	35

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0427

TABLE Q-1 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - UNDEVELOPED LANDFILL GRID SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-013SS-01	AL-GL-014SS-01	AL-GL-021SS-01	AL-GL-022SS-01	AL-GL-023SS-01	AL-GL-028SS-01
Instrument #	Q024	Q024	Q028	Q028	Q024	Q024
Date of Analysis	4-16-94	4-15-94	4-13-94	4-12-94	4-18-94	4-15-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	356	317u	317u	282u	282u
Manganese	3039	1734	5200	2740u	673u	2360
Iron	342912	265372	178800	168544	11577	166008
Cobalt	1007	1633	2530	1705	628u	1206
Nickel	206u	206u	710	396u	206u	206u
Copper	1440	4855	1920	1605	101u	514
Zinc	6228	5732	11670	4662	285	2336
Arsenic	445u	94	433u	331u	72	268u
Selenium	35u	35u	60u	60u	35u	35u
Strontium	305	308	210	223	177	203
Zirconium	95	148	157	256	103	206
Molybdunum	10u	10u	15u	26	10u	10u
Mercury	219	70u	139u	139u	78	70u
Lead	4453	4176	4330	3307	44u	2685
Rubidium	55	23u	139	63	36	40

Sample ID	AL-GL-029SS-01	AL-GL-030SS-01	AL-GL-035SS-01	AL-GL-036SS-01	AL-GL-037SS-01	AL-GL-038SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-13-94	4-18-94	4-18-94	4-13-94	4-18-94	4-18-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	308	282u	282u	428	282u
Manganese	673u	1013	1123	3200	673u	1126
Iron	44550	54650	34747	146400	76740	105708
Cobalt	628u	628u	628u	840	628u	628u
Nickel	206u	206u	206u	206u	206u	206u
Copper	101u	430	173	699	622	470
Zinc	273	2495	847	5730	5549	3336
Arsenic	69	85	68u	165u	83	86
Selenium	35u	35u	35u	35u	35u	35u
Strontium	197	238	246	166	233	256
Zirconium	185	135	233	250	136	140
Molybdunum	10u	10u	10u	20	10u	10u
Mercury	70u	127	70u	70u	94	99
Lead	75	1108	605	1653	1110	2045
Rubidium	136	39	48	25	23u	30

u - Analyte is undetected. Reported value is the instrument detection limit.

TABLE Q-1 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - UNDEVELOPED LANDFILL GRID SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-040SS-01	AL-GL-041SS-01	AL-GL-043SS-01	AL-GL-044SS-01	AL-GL-045SS-01	AL-GL-046SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-20-94	4-15-94	4-15-94	4-13-94	4-13-94	4-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	380	282u	282u	282u	282u	482
Manganese	1116	673u	700	1370	2180	1704
Iron	128754	15581	34262	81320	236200	236774
Cobalt	384	628u	628u	628u	800	1100
Nickel	142u	206u	206u	206u	206u	206u
Copper	1820	101u	171	2450	1140	1618
Zinc	6014	107	823	3580	4440	6059
Arsenic	52u	68u	68u	198u	276u	341u
Selenium	42u	35u	35u	35u	35u	35u
Strontium	281	248	272	206	313	338
Zirconium	135	270	324	231	141	118
Molybdunum	10	10u	10u	10u	10u	10u
Mercury	55u	70u	70u	70u	70u	112
Lead	4675	44u	252	1975	2763	3410
Rubidium	24	60	75	23u	30	38

Sample ID	AL-GL-053SS-01	AL-GL-054SS-01	AL-GL-055SS-01	AL-GL-061SS-01	AL-GL-062SS-01	AL-GL-063SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-16-94	4-18-94	4-13-94	4-14-94	4-18-94	4-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	362	282u	282u	460	282u	282u
Manganese	2279	673u	1690	1843	968	1698
Iron	216989	28180	124900	169458	39738	79787
Cobalt	705	628u	628u	628u	628u	628u
Nickel	206u	206u	206u	206u	206u	206u
Copper	1469	101u	1270	904	101u	738
Zinc	10945	164	4130	6045	276	2830
Arsenic	395u	72	291u	367u	68u	220u
Selenium	35u	35u	35u	35u	35u	35u
Strontium	311	203	367	197	198	246
Zirconium	368	226	154	144	167	142
Molybdunum	10u	10u	10u	10u	10u	10u
Mercury	70u	70u	70u	70u	70u	70u
Lead	3949	63	2191	3668	216	2197
Rubidium	36	89	30	61	95	62

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0429

TABLE Q-1 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - UNDEVELOPED LANDFILL GRID SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-069SS-01	AL-GL-070SS-01	AL-GL-071SS-01	AL-GL-072SS-01	AL-GL-078SS-01	AL-GL-079SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q037
Date of Analysis	4-15-94	4-18-94	4-18-94	4-18-94	4-14-94	4-20-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	403	465	282u	282u	396	267u
Manganese	2182	2885	673u	691	1523	1445
Iron	154661	224092	39350	33441	109449	172896
Cobalt	628u	628u	628u	628u	628u	205
Nickel	206u	276	206u	206u	206u	142u
Copper	1643	1141	101u	101u	1986	1231
Zinc	6237	7558	783	203	6058	4462
Arsenic	341u	421u	68u	71	319u	52u
Selenium	35u	35u	35u	35u	35u	42u
Strontium	322	256	225	233	308	240
Zirconium	254	133	157	281	208	179
Molybdunum	10u	10u	10u	10u	10u	7
Mercury	70u	199	70u	70u	70u	55u
Lead	3410	4211	432	127	3192	4289
Rubidium	23u	23u	84	95	59	21u

Sample ID	AL-GL-080SS-01	AL-GL-081SS-01	AL-GL-086SS-01	AL-GL-087SS-01	AL-GL-089SS-01	AL-GL-090SS-01
Instrument #	Q024	Q024	Q024	Q037	Q037	Q037
Date of Analysis	4-14-94	4-18-94	4-15-94	4-20-94	4-20-94	4-20-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	282u	282u	336	267u	267u
Manganese	673u	673u	1231	2290	459	543
Iron	68377	29440	155022	259836	19775	37064
Cobalt	628u	628u	628u	1412	148u	148u
Nickel	206u	206u	206u	142u	398	142u
Copper	149	101u	1008	1608	101	153
Zinc	971	256	4077	6686	1239	425
Arsenic	68u	95	240u	52u	52u	134
Selenium	35u	35u	35u	42u	42u	42u
Strontium	204	180	259	266	177	558
Zirconium	173	190	150	161	147	223
Molybdunum	10u	10u	10u	8	6u	6u
Mercury	70u	70u	82	55u	55u	55u
Lead	491	96	2404	4951	48u	174
Rubidium	119	88	66	21u	73	64

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0430

TABLE Q-1 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - UNDEVELOPED LANDFILL SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-095SS-01	AL-GL-096SS-01
Instrument #	Q024	Q037
Date of Analysis	4-15-94	4-20-94
	ppm	ppm
ANALYTE		
Chromium	318	267u
Manganese	1458	431u
Iron	125248	25614
Cobalt	628u	148u
Nickel	206u	142u
Copper	987	103
Zinc	3024	395
Arsenic	323u	52u
Selenium	35u	42u
Strontium	261	187
Zirconium	197	189
Molybdunum	10u	8
Mercury	70u	55u
Lead	3232	239
Rubidium	75	87

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0431

TABLE Q-2
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - DEVELOPED LANDFILL SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-015SS-01	AL-GL-016SS-01	AL-GL-017SS-01	AL-GL-018SS-01	AL-GL-019SS-01	AL-GL-020SS-01
Instrument #	Q028	Q028	Q028	Q028	Q028	Q028
Date of Analysis	4-12-94	4-12-94	4-13-94	4-12-94	4-13-94	4-12-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	317u	317u	317u	317u	317u	317u
Manganese	2740u	2740u	3510	2740u	2740u	2740u
Iron	13030	35550	99700	63384	32631	22620
Cobalt	745u	745u	1710	745u	745u	745u
Nickel	396u	396u	470	396u	396u	396u
Copper	97u	97u	877	195	97u	97u
Zinc	43u	721	3000	1061	1026	198
Arsenic	77u	77u	242u	77u	77u	77u
Selenium	60u	60u	60u	60u	60u	60u
Strontium	252	156	378	212	220	198
Zirconium	304	98	127	136	279	369
Molybdunum	15u	15u	15u	15u	15u	15u
Mercury	139u	139u	139u	139u	139u	139u
Lead	68u	411	2415	761	432	68u
Rubidium	82	74	106	70	96	79

Sample ID	AL-GL-024SS-01	AL-GL-025SS-01	AL-GL-026SS-01	AL-GL-027SS-01	AL-GL-031SS-01	AL-GL-032SS-01
Instrument #	Q028	Q028	Q028	Q028	Q028	Q024
Date of Analysis	4-12-94	4-13-94	4-12-94	4-13-94	4-13-94	4-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	317u	317u	317u	317u	317u	256
Manganese	2740u	2740u	2740u	2740u	2740u	673u
Iron	26320	11600	14120	48080	9260	12447
Cobalt	745u	745u	745u	880	745u	628u
Nickel	396u	396u	396u	396u	396u	206u
Copper	99	97u	97u	158	97u	101u
Zinc	432	47	55	1135	54	72
Arsenic	77u	77u	77u	77u	77u	68u
Selenium	60u	60u	60u	60u	60u	35u
Strontium	140	152	150	187	163	251
Zirconium	155	162	166	201	328	196
Molybdunum	15u	15u	15u	15u	15u	10u
Mercury	139u	139u	139u	139u	139u	70u
Lead	485	68u	68u	778	68u	44u
Rubidium	50	70	71	82	54	60

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0433

TABLE Q-2 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - DEVELOPED LANDFILL SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-033SS-01	AL-GL-034SS-01	AL-GL-039SS-01	AL-GL-042SS-01	AL-GL-047SS-01	AL-GL-048SS-01
Instrument #	Q024	Q028	Q024	Q024	Q024	Q024
Date of Analysis	4-14-94	4-13-94	4-13-94	4-13-94	4-18-94	4-15-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	317u	282u	282u	282u	282u
Manganese	673u	2740u	673u	673u	938	673u
Iron	17543	22860	9560	23920	52601	55400
Cobalt	628u	745u	628u	628u	628u	628u
Nickel	206u	396u	206u	206u	206u	206u
Copper	101u	97u	101u	101u	188	196
Zinc	111	431	70u	370	1236	925
Arsenic	68u	77u	68u	68u	83u	70
Selenium	35u	60u	35u	35u	35u	35u
Strontium	247	226	238	230	224	191
Zirconium	266	289	216	277	261	112
Molybdunum	10u	15u	10u	10u	10u	10u
Mercury	70u	139u	70u	70u	78	70u
Lead	44u	313	44u	124	828	547
Rubidium	81	57	60	94	55	66

Sample ID	AL-GL-049SS-01	AL-GL-050SS-01	AL-GL-051SS-01	AL-GL-052SS-01	AL-GL-056SS-01	AL-GL-057SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-15-94	4-13-94	4-13-94	4-13-94	4-18-94	4-18-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	282u	282u	282u	282u	282u
Manganese	673u	673u	673u	673u	673u	673u
Iron	16628	27260	27460	25910	27764	18167
Cobalt	628u	628u	628u	628u	628u	628u
Nickel	206u	206u	206u	206u	206u	206u
Copper	101u	101u	101u	101u	101u	101u
Zinc	111	417	359	211	433	191
Arsenic	68u	68u	68u	68u	68u	68u
Selenium	35u	35u	35u	35u	35u	35u
Strontium	187	211	213	225	196	223
Zirconium	162	253	267	326	112	123
Molybdunum	10u	10u	10u	10u	10u	10u
Mercury	70u	70u	70u	70u	70u	70u
Lead	44u	295	170	208	268	139
Rubidium	54	64	91	90	44	51

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0434

TABLE Q-2 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - DEVELOPED LANDFILL SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-058SS-01	AL-GL-059SS-01	AL-GL-060SS-01	AL-GL-064SS-01	AL-GL-065SS-01	AL-GL-066SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-13-94	4-18-94	4-16-94	4-15-94	4-16-94	4-13-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	282u	289	282u	282u	282u
Manganese	673u	932	673u	673u	673u	673u
Iron	28480	61142	53732	52498	21637	46040
Cobalt	628u	628u	628u	628u	628u	628u
Nickel	206u	206u	206u	206u	206u	206u
Copper	101u	233	259	193	101u	200
Zinc	307	1157	1099	848	371	897
Arsenic	68u	83	70u	68u	68u	68u
Selenium	35u	35u	35u	35u	35u	35u
Strontium	205	169	208	199	199	205
Zirconium	286	237	246	182	303	325
Molybdunum	10u	10u	10u	10u	10u	10u
Mercury	70u	70u	70u	70u	70u	70u
Lead	178	672	704	565	190	601
Rubidium	81	35	64	55	87	75

Sample ID	AL-GL-067SS-01	AL-GL-068SS-01	AL-GL-073SS-01	AL-GL-074SS-01	AL-GL-075SS-01	AL-GL-076SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-18-94	4-16-94	4-15-94	4-15-94	4-14-94	4-18-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	282u	282u	282u	282u	282u
Manganese	877	673u	673u	784	673u	673u
Iron	59473	43038	15207	45011	32465	18196
Cobalt	628u	628u	628u	628u	628u	628u
Nickel	206u	206u	206u	206u	206u	206u
Copper	307	156	101u	153	101u	101u
Zinc	1159	961	228	822	527	114
Arsenic	76u	68u	68u	68u	68u	76
Selenium	35u	35u	35u	35u	35u	35u
Strontium	205	254	221	217	253	216
Zirconium	350	165	117	152	334	198
Molybdunum	10u	10u	10u	10u	10u	10u
Mercury	70u	70u	70u	70u	70u	70u
Lead	755	495	127	574	295	44u
Rubidium	59	64	59	63	62	65

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0435

TABLE Q-2 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - DEVELOPED LANDFILL SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-077SS-01	AL-GL-082SS-01	AL-GL-083SS-01	AL-GL-084SS-01	AL-GL-085SS-01	AL-GL-088SS-01
Instrument #	Q024	Q024	Q024	Q024	Q024	Q024
Date of Analysis	4-16-94	4-16-94	4-15-94	4-16-94	4-16-94	4-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	307	537	304	282u	347
Manganese	673u	673u	1217	884	673u	673u
Iron	26210	34770	91987	50722	13674	41310
Cobalt	628u	628u	628u	628u	628u	628u
Nickel	206u	206u	206u	206u	206u	206u
Copper	101u	131	1148	227	101u	101u
Zinc	635	780	2813	1552	245	600
Arsenic	68u	68u	126u	84u	68u	68u
Selenium	35u	35u	35u	35u	35u	35u
Strontium	243	215	154	202	192	221
Zirconium	112	169	146	139	164	158
Molybdunum	10u	10u	10u	10u	10u	10u
Mercury	70u	70u	74	70u	70u	70u
Lead	201	536	1257	842	143	305
Rubidium	69	74	46	65	58	103

Sample ID	AL-GL-091SS-01	AL-GL-092SS-01	AL-GL-093SS-01	AL-GL-094SS-01	AL-GL-097SS-01	AL-GL-098SS-01
Instrument #	Q045	Q024	Q024	Q024	Q024	Q024
Date of Analysis	5-5-94	4-15-94	4-16-94	4-16-94	4-15-94	4-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	282u	282u	372	282u	282u
Manganese	844	673u	673u	955	673u	673u
Iron	42745	35294	18609	46431	22106	16190
Cobalt	452u	628u	628u	628u	628u	628u
Nickel	81u	206u	206u	206u	206u	206u
Copper	135	101u	101u	198	101u	101u
Zinc	1063	767	312	2463	509	277
Arsenic	60u	68u	68u	68u	68u	68u
Selenium	23u	35u	35u	35u	35u	35u
Strontium	212	186	196	212	270	168
Zirconium	165	136	134	174	177	95
Molybdunum	7u	10u	10u	10u	10u	10u
Mercury	50u	70u	70u	70u	70u	70u
Lead	561	498	166	486	413	134
Rubidium	56	59	62	64	62	58

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0436

TABLE Q-2 (CONT.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - DEVELOPED LANDFILL SAMPLES
ZT2061 ELA0116SDI

Sample ID	AL-GL-099SS-01	AL-GL-100SS-01	AL-GL-101SS-01	AL-GL-102SS-01	AL-GL-103SS-01	AL-GL-104SS-01
Instrument #	Q024	Q024	Q024	Q037	Q024	Q037
Date of Analysis	4-15-94	4-18-94	4-16-94	4-20-94	4-13-94	4-20-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	282u	282u	282u	267u	371	267u
Manganese	673u	673u	673u	431u	673u	431u
Iron	35213	18695	12423	28937	23620	17745
Cobalt	628u	628u	628u	148u	628u	148u
Nickel	206u	206u	206u	142u	206u	142u
Copper	101u	101u	101u	133	101u	53u
Zinc	857	248	170	694	493	262
Arsenic	68u	68u	68u	52u	68u	56
Selenium	35u	35u	35u	42u	35u	42u
Strontium	221	215	176	152	191	228
Zirconium	172	158	201	105	149	172
Molybdunum	10u	10u	10u	6u	10u	6u
Mercury	70u	70u	70u	55u	70u	55u
Lead	538	140	44u	420	274	138
Rubidium	91	42	55	33	62	61

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0437

TABLE Q-3
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - INTERIOR BORINGS/WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-027SB-01	AL-MW-027SB-02	AL-MW-027SB-03	AL-MW-028SB-01	AL-MW-028SB-02	AL-MW-028SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-15-94	5-15-94	5-15-94	5-13-94	5-13-94	5-13-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	487	254u	254u	254u	267	254u
Manganese	2987	496u	482	1209	2149	515
Iron	180309	71232	17585	208334	211771	63483
Cobalt	452u	452u	452u	1187	452u	452u
Nickel	275	81u	81u	81u	108	81u
Copper	1913	85	64u	1525	1546	64u
Zinc	8320	472	102	4073	6177	493
Arsenic	434u	60u	60u	246u	341u	80
Selenium	23u	23u	23u	23u	23u	23u
Strontium	462	173	230	342	331	186
Zirconium	139	173	361	189	164	131
Molybdenum	18	7u	7u	12	9	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	4345	201	27u	2465	3412	148
Rubidium	30u	95	95	30u	30u	105

Sample ID	AL-MW-028SB-04	AL-MW-028SB-05	AL-MW-028SB-06	AL-MW-028SB-07	AL-MW-028SB-08	AL-MW-028SB-09
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-13-94	5-13-94	5-13-94	5-13-94	5-13-94	5-13-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	734	992	605	1036	496u	496u
Iron	27871	38438	34827	35261	14879	15815
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	117	111	150	146	59	74
Arsenic	60u	60u	60u	70	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	238	196	164	179	100	55
Zirconium	252	210	210	220	348	351
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	113	129	144	126	62	48

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0438

TABLE Q-3 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - INTERIOR BORINGS/WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-028SB-10	AL-MW-028SB-11	AL-MW-028SB-12	AL-MW-029SB-01	AL-MW-030SB-01	AL-MW-030SB-02
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-13-94	5-13-94	5-13-94	4-25-94	5-5-94	5-5-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	496u	1299	1481
Iron	11861	14733	11214	47774	132324	154517
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	94	81u
Copper	64u	64u	64u	64u	442	628
Zinc	150	92	178	183	3516	3078
Arsenic	60u	60u	60u	60u	250u	266u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	47u	88	47u	147	374	399
Zirconium	192	401	188	165	170	141
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	2499	2661
Rubidium	30u	64	31	128	30u	30u

Sample ID	AL-MW-030SB-03	AL-MW-030SB-04	AL-MW-030SB-05	AL-MW-030SB-06	AL-MW-031SB-01	AL-MW-032SB-01
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-5-94	5-5-94	5-5-94	5-5-94	4-25-94	4-22-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	341
Manganese	496u	764	828	496u	1574	1270
Iron	48146	26877	32999	36863	151359	96066
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	100	64u	64u	64u	675	528
Zinc	402	173	189	130	4586	2393
Arsenic	60u	60u	60u	60u	408u	186u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	186	197	206	196	317	297
Zirconium	149	248	196	216	215	330
Molybdenum	8	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	137	29	27u	27u	4085	1860
Rubidium	105	108	132	135	30u	30u

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0439

TABLE Q-3 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - INTERIOR BORINGS/WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-032SB-02	AL-MW-032SB-03	AL-MW-032SB-04	AL-MW-032SB-05	AL-MW-032SB-06	AL-MW-032SB-07
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-22-94	4-22-94	4-22-94	4-22-94	4-24-94	4-24-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	1347	496u	496u	794	496u	806
Iron	149854	27885	15382	23238	35240	41110
Cobalt	561	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	101	81u
Copper	752	64u	64u	64u	64u	64u
Zinc	9908	161	118	136	163	116
Arsenic	330u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	295	157	238	196	185	189
Zirconium	184	200	352	228	219	194
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	3301	27u	27u	27u	27u	27u
Rubidium	30u	102	96	109	129	137

Sample ID	AL-MW-032SB-08	AL-MW-032SB-09	AL-MW-032SB-10	AL-MW-032SB-11	AL-MW-033SB-01	AL-MW-034SB-01
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94	5-3-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	839	496u	496u	496u	496u	2453
Iron	38975	14192	19622	5020u	35498	335771
Cobalt	452u	452u	452u	452u	452u	882
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	1841
Zinc	129	100	58	40u	231	4397
Arsenic	60u	60u	60u	60u	60u	355u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	174	129	71	47u	168	281
Zirconium	210	424	448	53	181	123
Molybdenum	7u	7u	7u	7u	7u	19
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	3548
Rubidium	130	34	45	30u	124	30u

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0440

TABLE Q-3 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - INTERIOR BORINGS/WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-034SB-02	AL-MW-034SB-03	AL-MW-034SB-04	AL-MW-034SB-05	AL-MW-034SB-06	AL-MW-034SB-07
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-3-94	5-3-94	5-3-94	5-3-94	5-3-94	5-5-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	537	696	836	1077
Iron	50783	44017	18955	28356	42151	41653
Cobalt	452u	521	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	289	187	93	115	147	161
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	174	188	239	215	194	172
Zirconium	161	171	348	259	195	181
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	67	50	27u	27u	27u	27u
Rubidium	146	133	113	128	143	144

Sample ID	AL-MW-034SB-08	AL-MW-034SB-09	AL-MW-034SB-10	AL-MW-034SB-11	AL-MW-034SB-12	AL-MW-036SB-01
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-5-94	5-5-94	5-5-94	5-5-94	5-5-94	5-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	616	496u	536	496u	496u	496u
Iron	31511	12181	21608	25547	6002	9635
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	143	60	77	92	40u	40u
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	162	87	140	94	47u	284
Zirconium	285	503	597	373	133	191
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	117	30u	60	65	30u	53

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0441

TABLE Q-3 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - INTERIOR BORINGS/WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-036SB-02	AL-MW-036SB-03	AL-MW-036SB-04	AL-MW-038SB-01	AL-MW-038SB-02	AL-MW-038SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-16-94	5-16-94	5-16-94	5-15-94	5-15-94	5-15-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	274	254u	254u	254u	254u
Manganese	1025	1585	496u	5270	496u	496u
Iron	64200	140638	45624	244226	52034	45157
Cobalt	452u	466	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	1717	384	64u	838	293	64u
Zinc	2151	3460	246	9618	4379	393
Arsenic	351u	306u	62	385u	124u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	325	365	196	427	491	175
Zirconium	165	150	163	98	119	225
Molybdenum	7u	7u	7u	10	7u	7u
Mercury	75	50u	50u	50u	50u	50u
Lead	3506	3062	83	3852	1238	97
Rubidium	30u	30u	102	30u	33	111

Sample ID	AL-MW-040SB-01	AL-MW-040SB-02	AL-MW-040SB-03	AL-MW-046SB-01	AL-MW-046SB-02	AL-MW-046SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-15-94	5-15-94	5-15-94	5-16-94	5-16-94	5-17-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	264	254u	335	377	254u
Manganese	2105	2241	2133	1676	1986	1032
Iron	243902	197765	193105	175627	216906	173933
Cobalt	519	452u	589	741	569	452u
Nickel	81u	81u	81u	241	81u	81u
Copper	839	1201	983	2001	1363	446
Zinc	4856	8851	6803	5511	5100	4947
Arsenic	423u	693u	422u	260u	378u	408u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	321	468	338	347	374	381
Zirconium	167	139	144	155	122	133
Molybdenum	11	7u	8	18	47	11
Mercury	50u	50u	50u	50u	50u	50u
Lead	4228	6927	4218	2595	3776	4076
Rubidium	30u	30u	30u	30u	30u	30u

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0442

TABLE Q-4
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - TEST PITS
ZT2061 ELA0116SDI

Sample ID	AL-TP-001TS-01	AL-TP-001TS-02	AL-TP-002TS-01	AL-TP-002TS-02	AL-TP-003TS-01
Instrument #	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-7-94	5-7-94	5-7-94	5-7-94	5-15-94
	ppm	ppm	ppm	ppm	ppm
ANALYTE					
Chromium	254u	254u	254u	2104	480
Manganese	1146	496u	549	1885	1511
Iron	110464	43331	75343	280657	143470
Cobalt	452u	452u	521	697	546
Nickel	81u	81u	81u	81u	81u
Copper	1667	64u	510	387	960
Zinc	2661	604	2735	2193	5763
Arsenic	122u	88	169u	355u	357u
Selenium	23u	23u	23u	23u	23u
Strontium	338	174	161	374	448
Zirconium	208	152	104	82	126
Molybdenum	7u	7u	7u	7u	13
Mercury	50u	50u	50u	50u	50u
Lead	1219	191	1689	3551	3566
Rubidium	32	126	30u	30u	30u

Sample ID	AL-TP-003TS-02	AL-TP-004TS-01	AL-TP-004TS-02	AL-TP-005TS-01	AL-TP-005TS-02
Instrument #	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-12-94	5-12-94	5-12-94	5-12-94	5-12-94
	ppm	ppm	ppm	ppm	ppm
ANALYTE					
Chromium	254u	308	593	254u	254u
Manganese	2706	1526	2174	1333	496u
Iron	410780	141425	206031	163856	23656
Cobalt	452u	551	1151	736	452u
Nickel	284	81u	81u	81u	81u
Copper	760	1384	743	1421	64u
Zinc	9786	5492	5935	12952	292
Arsenic	791u	248	458u	607u	77
Selenium	23u	23u	23u	23u	23u
Strontium	435	405	374	288	229
Zirconium	73	125	130	178	91
Molybdenum	10	14	7u	7u	7u
Mercury	50u	50u	50u	50u	50u
Lead	7906	4531	4582	6070	78
Rubidium	30u	30u	30u	30u	90

u - Analyte is undetected. Reported Value is the instrument detection limit.

001160.0443

TABLE Q-5
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-001SB-01	AL-MW-001SB-02	AL-MW-001SB-03	AL-MW-002SB-01	AL-MW-002SB-02	AL-MW-002SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-22-94	4-22-94	4-22-94	4-22-94	4-22-94	4-22-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	534	798	959	496u	496u	742
Iron	33511	22454	29362	36765	20074	20429
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	110	64u	64u	64u	64u	64u
Zinc	447	129	152	223	166	140
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	205	193	181	141	205	192
Zirconium	158	260	213	165	269	236
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	156	27u	27u	27u	27u	27u
Rubidium	97	101	118	151	92	101

Sample ID	AL-MW-002SB-04	AL-MW-002SB-05	AL-MW-002SB-06	AL-MW-002SB-07	AL-MW-002SB-08	AL-MW-002SB-09
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-22-94	4-22-94	4-22-94	5-15-94	5-15-94	5-15-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	1034	880	602	496u	496u	496u
Iron	21115	32270	30103	11907	11148	11112
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	132	158	166	55	78	85
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	209	162	167	121	47u	47u
Zirconium	292	172	190	329	176	232
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	117	113	117	31	30u	33

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0444

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-002SB-10	AL-MW-002SB-11	AL-MW-003SB-01	AL-MW-004SB-01	AL-MW-004SB-02	AL-MW-004SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-15-94	5-15-94	4-23-94	5-14-94	5-14-94	5-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	284	254u	254u
Manganese	496u	496u	571	1967	496u	509
Iron	5452	9065	22925	222694	48014	25152
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	998	64u	64u
Zinc	54	60	130	3933	149	133
Arsenic	60u	60u	60u	66	66	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	47u	47u	242	452	148	218
Zirconium	195	94	379	129	162	267
Molybdenum	7u	7u	7u	9	5	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	2561	27u	27u
Rubidium	30u	30u	112	30u	151	120

Sample ID	AL-MW-004SB-04	AL-MW-004SB-05	AL-MW-004SB-06	AL-MW-004SB-07	AL-MW-004SB-08	AL-MW-004SB-09
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-14-94	5-14-94	5-14-94	5-14-94	5-14-94	5-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	761	917	623	1033	496u	496u
Iron	21951	33819	35462	39689	8444	16684
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	103	143	156	118	56	68
Arsenic	60u	60u	69	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	237	203	175	176	76	79
Zirconium	343	228	199	222	260	630
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	93	128	117	127	30u	43

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0445

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-004SB-10	AL-MW-004SB-11	AL-MW-004SB-12	AL-MW-005SB-01	AL-MW-006SB-01	AL-MW-006SB-02
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-14-94	5-14-94	5-14-94	4-23-94	5-13-94	5-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	496u	833	496u
Iron	12565	5020u	16779	21503	121753	47116
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	907	64u
Zinc	45	63	73	116	2452	105
Arsenic	60u	60u	60u	60u	159u	84
Selenium	23u	23u	23u	23u	23u	23u
Strontium	47u	47u	79	239	267	270
Zirconium	235	105	387	342	231	144
Molybdenum	7u	7u	7u	7u	16	12
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	1593	27u
Rubidium	31	30u	52	102	68	77

Sample ID	AL-MW-006SB-03	AL-MW-006SB-04	AL-MW-006SB-05	AL-MW-006SB-06	AL-MW-006SB-07	AL-MW-006SB-08
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-14-94	5-14-94	5-14-94	5-14-94	5-14-94	5-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	538	496u	901	874	833	846
Iron	20710	19296	38779	35500	30650	30950
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	142	88	161	120	118	114
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	224	263	189	196	150	151
Zirconium	250	347	187	187	309	282
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	110	89	134	149	100	90

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0446

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-006SB-09	AL-MW-006SB-10	AL-MW-006SB-11	AL-MW-006SB-12	Al-MW-007SB-01	Al-MW-008SB-01
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-14-94	5-14-94	5-14-94	5-14-94	4-23-94	5-5-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	563	496u	496u	496u	496u	1006
Iron	28909	24354	7586	10248	17580	96533
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	393
Zinc	85	101	40u	51	116	2208
Arsenic	60u	60u	60u	60u	60u	91u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	181	223	63	67	256	270
Zirconium	283	402	96	172	434	165
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	913
Rubidium	95	80	36	41	104	30u

Sample ID	Al-MW-008SB-02	Al-MW-008SB-03	Al-MW-008SB-04	AL-MW-009SB-01	AL-MW-010SB-01	AL-MW-010SB-02
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-5-94	5-5-94	5-5-94	4-23-94	5-12-94	5-12-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	505	956	554	767	960	496u
Iron	20023	40508	40592	40650	101495	35840
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	503	64u
Zinc	94	128	128	245	2626	176
Arsenic	60u	60u	60u	60u	130u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	237	204	173	175	317	165
Zirconium	295	202	179	200	203	182
Molybdenum	7u	7u	7u	7u	9	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	57	1302	44
Rubidium	95	130	131	143	89	141

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0447

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-010SB-03	AL-MW-010SB-04	AL-MW-010SB-05	AL-MW-010SB-06	AL-MW-010SB-07	AL-MW-010SB-08
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-12-94	5-12-94	5-12-94	5-13-94	5-13-94	5-13-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	788	681	1015	691	496u
Iron	14238	36060	35708	39560	36573	14203
Cobalt	452u	452u	514	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	77	106	148	162	128	58
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	257	199	202	160	161	100
Zirconium	517	224	232	206	257	641
Molybdenum	7u	7u	7u	7u	7u	9
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	76	128	137	132	120	32

Sample ID	AL-MW-010SB-09	AL-MW-010SB-10	AL-MW-011SB-01	AL-MW-012SB-01	AL-MW-012SB-02	AL-MW-012SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-13-94	5-13-94	4-23-94	4-22-94	4-22-94	4-22-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	935	496u	496u	496u
Iron	19321	5020u	38367	47318	36647	10521
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	121	64u	64u
Zinc	106	112	173	529	189	104
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	93	47u	262	165	169	238
Zirconium	540	88	434	148	149	535
Molybdenum	7u	7u	7u	7u	8	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	94	27u	27u
Rubidium	54	30u	105	144	134	69

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0448

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-O12SB-04	AL-MW-O12SB-05	AL-MW-O12SB-06	AL-MW-O12SB-07	AL-MW-O12SB-08	AL-MW-O12SB-09
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-22-94	4-23-94	4-23-94	4-25-94	4-25-94	4-25-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	802	830	861	879	592	496u
Iron	31958	42163	37668	43046	22129	15232
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	83	64u	64u	64u	64u	64u
Zinc	142	137	142	165	88	68
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	161	173	196	156	132	96
Zirconium	168	179	214	230	371	735
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	137	149	136	137	89	33

Sample ID	AL-MW-O12SB-10	AL-MW-O12SB-11	AL-MW-O12SB-12	AL-MW-O13SB-01	AL-MW-O13SB-02	AL-MW-O13SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-25-94	4-25-94	4-25-94	4-22-94	4-22-94	4-22-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	496u	496u	496u
Iron	20948	20095	5020u	8850	33503	14337
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	118	64u	64u
Zinc	57	78	117	146	203	130
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	89	80	47u	173	152	231
Zirconium	580	392	61	89	164	407
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	66	27u	27u
Rubidium	55	57	30u	49	134	90

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0449

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-O14SB-01	AL-MW-O14SB-02	AL-MW-O14SB-03	AL-MW-O14SB-04	AL-MW-O14SB-05	AL-MW-O14SB-06
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-22-94	4-22-94	4-22-94	4-22-94	4-22-94	4-22-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	855	554	716	732	913	1144
Iron	47891	58928	35730	23430	35818	33054
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	200	69	64u	64u	64u	64u
Zinc	1118	126	173	135	131	297
Arsenic	68u	67	78	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	352	176	154	184	183	192
Zirconium	167	97	179	196	187	185
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	685	27u	27u	27u	27u	66
Rubidium	56	62	112	104	123	102

Sample ID	AL-MW-O14SB-07	AL-MW-O14SB-08	AL-MW-O14SB-09	AL-MW-O14SB-10	AL-MW-O14SB-11	AL-MW-O14SB-12
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	975	1022	409	451	496u	496u
Iron	32938	37521	27040	16402	24357	7198
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	130	119	123	51	44	95
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	203	177	155	85	108	47u
Zirconium	293	289	293	678	629	104
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	116	123	99	42	56	30u

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0450

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-015SB-01	AL-MW-016SB-01	AL-MW-016SB-02	AL-MW-016SB-03	AL-MW-016SB-04	AL-MW-016SB-05
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	4-23-94	5-13-94	5-13-94	5-13-94	5-13-94	5-13-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	496u	496u	638
Iron	53234	34360	42566	53339	16238	35716
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	242	765	148	162	64	140
Arsenic	60u	60u	69	85	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	194	297	168	193	234	172
Zirconium	193	230	164	161	411	172
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	307	27u	27u	27u	27u
Rubidium	138	85	135	139	90	121

Sample ID	AL-MW-016SB-06	AL-MW-016SB-07	AL-MW-016SB-08	AL-MW-016SB-09	AL-MW-016SB-10	AL-MW-017SB-01
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-13-94	5-13-94	5-13-94	5-13-94	5-13-94	4-24-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	600	566	1071	496u	496u	721
Iron	30934	30963	29072	18197	5020u	16796
Cobalt	452u	452u	499	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	104	152	113	54	43	113
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	202	172	155	85	47u	289
Zirconium	231	305	246	573	94	721
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	29	27u	27u	27u	27u
Rubidium	129	105	116	45	30u	96

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0451

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-018SB-01	AL-MW-018SB-02	AL-MW-018SB-03	AL-MW-018SB-04	AL-MW-018SB-05	AL-MW-018SB-06
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-13-94	5-13-94	5-13-94	5-13-94	5-13-94	5-13-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	279	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	639	634	1173
Iron	48736	58062	16545	28134	32029	38602
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	110	81u	81u	81u	81u
Copper	450	274	64u	64u	64u	64u
Zinc	1077	1074	95	131	131	111
Arsenic	60u	60u	60u	60u	74	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	262	229	228	196	175	163
Zirconium	190	199	395	216	201	189
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	548	507	27u	27u	27u	27u
Rubidium	48	83	87	116	140	143

Sample ID	AL-MW-018SB-07	AL-MW-018SB-08	AL-MW-018SB-09	AL-MW-018SB-10	AL-MW-019SB-01	AL-MW-019SB-02
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-17-94	5-17-94	5-17-94	5-17-94	5-13-94	5-13-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	496u	496u	778
Iron	11088	11112	5020u	5020u	26887	35958
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	79	40u	40u	40u	170	256
Arsenic	60u	60u	60u	60u	73	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	150	47u	47u	57	207	213
Zirconium	237	209	72	135	247	170
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	28	147
Rubidium	30u	30u	30u	30u	99	77

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0452

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-019SB-03	AL-MW-020SB-01	AL-MW-020SB-02	AL-MW-020SB-03	AL-MW-020SB-04	AL-MW-020SB-05
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-13-94	5-15-94	5-15-94	5-15-94	5-15-94	5-15-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	697	621	496u	555	1023	894
Iron	22049	96715	42072	30389	38483	38629
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	81	64u	64u	64u	64u
Zinc	105	806	142	158	103	120
Arsenic	60u	424u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	233	217	164	204	200	163
Zirconium	328	252	171	217	213	188
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	4238	27u	27u	27u	27u
Rubidium	118	85	132	111	136	137

Sample ID	AL-MW-020SB-06	AL-MW-020SB-07	AL-MW-020SB-08	AL-MW-020SB-09	AL-MW-020SB-10	AL-MW-020SB-11
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-16-94	5-16-94	5-16-94	5-16-94	5-16-94	5-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	916	496u	496u	496u	496u	496u
Iron	36127	27733	5113	5303	5020u	5020u
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	167	130	40u	51	44	40u
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	175	199	47u	47u	47u	47u
Zirconium	233	232	67	43	71	66
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	126	95	30u	30u	30u	30u

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0453

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-021SB-01	AL-MW-021SB-02	AL-MW-021SB-03	AL-MW-022SB-01	AL-MW-022SB-02	AL-MW-022SB-03
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-13-94	5-13-94	5-13-94	5-15-94	5-15-94	5-15-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	609	254u	254u	254u	254u
Manganese	1541	1305	496u	1632	496u	496u
Iron	144662	146150	40853	123159	43214	19603
Cobalt	983	555	452u	512	452u	452u
Nickel	81u	81u	105	81u	81u	81u
Copper	1226	6953	64u	1133	64u	64u
Zinc	4611	2834	140	5104	185	101
Arsenic	304u	164u	60u	300u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	358	293	174	280	209	229
Zirconium	195	245	161	182	148	316
Molybdenum	15	21	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	3042	1641	27u	3004	27u	27u
Rubidium	30u	30u	126	30u	112	98

Sample ID	AL-MW-022SB-04	AL-MW-022SB-05	AL-MW-022SB-06	AL-MW-022SB-07	AL-MW-022SB-08	AL-MW-022SB-09
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-15-94	5-14-94	5-14-94	5-14-94	5-14-94	5-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	995	496u	1078	618	496u	496u
Iron	32979	30774	41115	31812	11096	9890
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	151	98	154	178	52	58
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	189	205	159	208	252	47u
Zirconium	221	243	187	192	203	387
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	126	118	133	124	30u	30u

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0454

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-022SB-10	AL-MW-022SB-11	AL-MW-022SB-12	AL-MW-023SB-01	AL-MW-024SB-01	AL-MW-024SB-02
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-14-94	5-14-94	5-14-94	4-24-94	5-3-94	5-3-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	660	254u
Manganese	496u	496u	496u	496u	1671	692
Iron	7712	6372	5051	43078	122071	71266
Cobalt	452u	452u	452u	452u	1163	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	461	314
Zinc	40u	58	40u	161	8345	2208
Arsenic	60u	60u	60u	60u	356u	208u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	47u	47u	47u	162	501	276
Zirconium	204	297	91	201	149	214
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	3562	2075
Rubidium	30u	30u	30u	161	30u	87

Sample ID	AL-MW-024SB-03	AL-MW-024SB-04	AL-MW-026SB-01	AL-MW-026SB-02	AL-MW-026SB-03	AL-MW-026SB-04
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-3-94	5-3-94	5-14-94	5-14-94	5-14-94	5-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	893	718	496u	496u	496u	496u
Iron	38281	34643	36493	37020	20438	18698
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	155	155	132	149	103	78
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	224	198	171	195	214	226
Zirconium	219	241	153	183	295	255
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	158	148	132	132	108	99

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0455

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-026SB-05	AL-MW-026SB-06	AL-MW-026SB-07	AL-MW-026SB-08	AL-MW-026SB-09	AL-MW-026SB-10
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-14-94	5-14-94	5-16-94	5-16-94	5-16-94	5-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	616	496u	903	575	599	496u
Iron	34658	33583	37443	36038	27527	12810
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	130	119	128	102	100	40u
Arsenic	60u	60u	60u	69	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	181	181	158	154	182	70
Zirconium	187	209	216	251	374	344
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	126	135	125	131	83	30u

Sample ID	AL-MW-026SB-11	AL-MW-026SB-12	AL-MW-026SB-13	AL-MW-026SB-14	AL-MW-041SB-01	AL-MW-042SB-01
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-16-94	5-16-94	5-16-94	5-16-94	5-16-94	5-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	496u	496u	496u
Iron	17033	19181	9037	5724	16680	50544
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	82
Copper	64u	64u	64u	64u	64u	64u
Zinc	73	47	40u	40u	99	172
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	80	50	60	49	254	149
Zirconium	333	241	337	142	362	192
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	33	31	41	30u	94	140

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0456

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-042SB-02	AL-MW-042SB-03	AL-MW-042SB-04	AL-MW-042SB-05	AL-MW-042SB-06	AL-MW-042SB-07
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-16-94	5-16-94	5-16-94	5-16-94	5-16-94	5-17-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	691	1209	549	496u
Iron	45737	16957	30548	37663	29599	15547
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	165	92	109	110	120	79
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	170	231	197	185	200	116
Zirconium	180	275	228	207	229	248
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	123	94	119	125	111	50

Sample ID	AL-MW-042SB-08	AL-MW-042SB-09	AL-MW-042SB-10	AL-MW-042SB-11	AL-MW-043SB-01	AL-MW-044SB-01
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-17-94	5-17-94	5-17-94	5-17-94	5-16-94	5-14-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	496u	496u	496u	1099	800
Iron	18498	14680	5020u	5020u	32339	37819
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	175
Zinc	89	67	40u	40u	139	930
Arsenic	60u	60u	60u	60u	60u	61u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	96	77	48	47u	170	234
Zirconium	515	474	253	62	245	225
Molybdenum	7u	14	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	614
Rubidium	50	52	30u	30u	120	92

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0457

TABLE Q-5 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PERIMETER/BACKGROUND WELLS
ZT2061 ELA0116SDI

Sample ID	AL-MW-044SB-02	AL-MW-044SB-03	AL-MW-044SB-04	AL-MW-044SB-05	AL-MW-044SB-06	AL-MW-044SB-07
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-15-94	5-15-94	5-15-94	5-15-94	5-16-94	5-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	626	863	777	903	1074	564
Iron	29410	29938	32672	38303	45387	29927
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	103	117	116	130	154	104
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	202	202	191	193	171	167
Zirconium	284	223	214	192	187	291
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	27u	27u	27u	27u	27u
Rubidium	112	135	128	142	136	103

Sample ID	AL-MW-044SB-08	AL-MW-044SB-09	AL-MW-044SB-10	AL-MW-044SB-11
Instrument #	Q045	Q045	Q045	Q045
Date of Analysis	5-16-94	5-16-94	5-16-94	5-16-94
	ppm	ppm	ppm	ppm
ANALYTE				
Chromium	254u	254u	254u	254u
Manganese	496u	496u	503	496u
Iron	11560	16582	20848	5020u
Cobalt	452u	452u	452u	452u
Nickel	81u	81u	81u	81u
Copper	64u	64u	64u	64u
Zinc	58	40u	50	40u
Arsenic	60u	60u	60u	60u
Selenium	23u	23u	23u	23u
Strontium	81	152	90	47u
Zirconium	245	603	529	130
Molybdenum	7u	8	7u	7u
Mercury	50u	50u	50u	50u
Lead	27u	27u	27u	27u
Rubidium	32	50	51	30u

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0458

TABLE Q-6
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - ALMONASTER/HIGGINS BORINGS
ZT2061 ELA0116SDI

Sample ID	AL-BL-001SB-01	AL-BL-001SB-02	AL-BL-001SB-03	AL-BL-001SB-04	AL-BL-002SB-01	AL-BL-002SB-02
Instrument #	Q045	Q045	Q045	Q045	Q045	Q045
Date of Analysis	5-7-94	5-7-94	5-7-94	5-7-94	5-16-94	5-16-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	254u	254u	254u	254u
Manganese	496u	591	496u	496u	496u	496u
Iron	8764	42548	15334	18618	19904	39421
Cobalt	452u	452u	452u	452u	452u	452u
Nickel	81u	81u	81u	81u	81u	81u
Copper	64u	64u	64u	64u	64u	64u
Zinc	69	229	54	40u	118	122
Arsenic	60u	60u	60u	60u	60u	60u
Selenium	23u	23u	23u	23u	23u	23u
Strontium	226	181	242	231	258	152
Zirconium	126	203	433	332	205	183
Molybdenum	7u	7u	7u	7u	7u	7u
Mercury	50u	50u	50u	50u	50u	50u
Lead	27u	58	27u	27u	54	27u
Rubidium	60	132	89	94	79	146

Sample ID	AL-BL-003SB-01	AL-BL-003SB-02	AL-BL-004SB-01	AL-BL-004SB-02	AL-BL-004SB-03	AL-BL-004SB-04
Instrument #	Q045	Q045	Q037	Q037	Q037	Q037
Date of Analysis	5-16-94	5-16-94	4-22-94	4-22-94	4-22-94	4-22-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	254u	254u	267u	267u	267u	267u
Manganese	496u	496u	1899	1785	431u	431u
Iron	43159	41460	253570	186086	16176	25775
Cobalt	452u	452u	148u	1166	148u	148u
Nickel	81u	81u	142u	142u	142u	142u
Copper	64u	64u	655	1848	53u	53u
Zinc	244	173	10897	6191	121	121
Arsenic	60u	60u	52u	52u	52u	52u
Selenium	23u	23u	42u	42u	42u	42u
Strontium	194	156	348	362	227	213
Zirconium	186	176	140	187	323	243
Molybdenum	7u	7u	7	16	6u	6u
Mercury	50u	50u	55u	55u	55u	55u
Lead	85	27u	2305	3775	48u	48u
Rubidium	126	147	21u	21u	87	107

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0459

TABLE Q-6 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - ALMONASTER/HIGGINS BORINGS
ZT2061 ELA0116SDI

Sample ID	AL-BL-005SB-01	AL-BL-005SB-02	AL-BL-005SB-03	AL-BL-005SB-04	AL-BL-006SB-01	AL-BL-006SB-02
Instrument #	Q037	Q037	Q037	Q037	Q037	Q037
Date of Analysis	4-22-94	4-22-94	4-22-94	4-22-94	4-21-94	4-21-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	267u	267u	267u	267u	267u	483
Manganese	782	431u	431u	776	1182	1162
Iron	73672	47894	31103	39890	195019	122616
Cobalt	148u	148u	148u	153	722	147
Nickel	142u	142u	142u	142u	142u	142u
Copper	563	974	86	53u	1092	5671
Zinc	3414	630	128	178	3872	6681
Arsenic	52u	52u	52u	52u	52u	52u
Selenium	42u	42u	42u	42u	42u	42u
Strontium	362	200	168	180	281	336
Zirconium	182	163	256	186	156	186
Molybdenum	6u	6u	6u	6u	15	6u
Mercury	55u	55u	55u	55u	55u	55u
Lead	1507	425	48u	48u	6532	6263
Rubidium	103	101	131	138	21u	21u

Sample ID	AL-BL-006SB-03	AL-BL-006SB-04	AL-BL-006SB-05	AL-BL-006SB-06	AL-BL-007SB-01	AL-BL-007SB-02
Instrument #	Q037	Q037	Q037	Q037	Q037	Q037
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-22-94	4-22-94
	ppm	ppm	ppm	ppm	ppm	ppm
ANALYTE						
Chromium	267u	267u	267u	267u	267u	267u
Manganese	2185	1012	431u	660	955	875
Iron	420745	174614	18485	22423	174603	36952
Cobalt	779	349	148u	201	865	237
Nickel	142u	142u	142u	142u	142u	142u
Copper	1223	443	53u	53u	846	59
Zinc	14453	3617	104	97	5982	159
Arsenic	52u	52u	71	52u	52u	52u
Selenium	42u	42u	42u	42u	42u	42u
Strontium	379	277	238	216	252	166
Zirconium	95	108	231	361	174	220
Molybdenum	6u	6u	6u	6u	6u	6u
Mercury	55u	55u	55u	55u	55u	55u
Lead	7734	2160	48u	48u	2843	48u
Rubidium	21u	41	100	91	49	120

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0460

TABLE Q-6 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - ALMONASTER/HIGGINS BORINGS
ZT2061 ELA0116SDI

Sample ID	AL-BL-007SB-03
Instrument #	Q037
Date of Analysis	4-22-94
	ppm
ANALYTE	
Chromium	267u
Manganese	431u
Iron	13549
Cobalt	148u
Nickel	142u
Copper	53u
Zinc	80
Arsenic	52u
Selenium	42u
Strontium	252
Zirconium	360
Molybdenum	6u
Mercury	55u
Lead	48u
Rubidium	79

u - Analyte is undetected. Reported value is the instrument detection limit.

001160.0461

TABLE Q-7
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN BACKGROUND RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-026XP-01A	AL-SG-026XP-01B	AL-SG-026XP-01C	AL-SG-026XP-02A	AL-SG-026XP-02B	AL-SG-026XP-02C
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1191	0.1382	0.1348	0.0517u	0.0517u	0.0533
Lead (K)	[1.10]	[0.709]	[0.517]	1.51u	[0.219]	1.51u

SAMPLE ID	AL-SG-026XP-03A	AL-SG-026XP-03B	AL-SG-026XP-03C	AL-SG-026XP-04A	AL-SG-026XP-04B	AL-SG-026XP-04C
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0517u	0.0517u	0.0517u	0.0517u	0.0517u	0.0517u
Lead (K)	[0.185]	[0.131]	[0.413]	1.51u	1.51u	1.51u

SAMPLE ID	AL-SG-026XP-05A	AL-SG-026XP-05B	AL-SG-026XP-05C	AL-SG-026XP-06A	AL-SG-026XP-06B	AL-SG-026XP-06C
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0517u	0.0517u	0.0517u	0.1882	0.1659	0.1681
Lead (K)	1.51u	1.51u	1.51u	[0.214]	[1.11]	[0.283]

SAMPLE ID	AL-SG-026XP-07A	AL-SG-026XP-07B	AL-SG-026XP-07C	AL-SG-026XP-08A	AL-SG-026XP-08B	AL-SG-026XP-08C
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0517u	0.0517u	0.0517u	0.0517u	0.1086	0.1021
Lead (K)	1.51u	1.51u	1.51u	2.0325	[0.378]	[0.582]

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0462

TABLE Q-7 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN BACKGROUND RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-026XP-09A	AL-SG-026XP-09B	AL-SG-026XP-09C	AL-SG-035XP-01A	AL-SG-035XP-01B	AL-SG-035XP-01C
Date of Analysis	4-21-94	4-21-94	4-21-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0517u	0.0517u	0.0517u	0.0332u	0.0332u	0.0332u
Lead (K)	[0.556]	1.51u	[0.129]	0.466u	0.466u	0.466u

SAMPLE ID	AL-SG-035XP-02A	AL-SG-035XP-02B	AL-SG-035XP-02C	AL-SG-035XP-03A	AL-SG-035XP-03B	AL-SG-035XP-03C
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u
Lead (K)	0.466u	0.466u	0.466u	0.466u	0.466u	0.466u

SAMPLE ID	AL-SG-035XP-04A	AL-SG-035XP-04B	AL-SG-035XP-04C	AL-SG-035XP-05A	AL-SG-035XP-05B	AL-SG-035XP-05C
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u
Lead (K)	[0.366]	[0.280]	[0.288]	0.466u	0.466u	0.466u

SAMPLE ID	AL-SG-035XP-06A	AL-SG-035XP-06B	AL-SG-035XP-06C	AL-SG-035XP-07A	AL-SG-035XP-07B	AL-SG-035XP-07C
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.2939	0.2833	0.0888
Lead (K)	0.466u	0.466u	0.466u	0.466u	0.466u	0.466u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0463

TABLE Q-7 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN BACKGROUND RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-035XP-08A	AL-SG-035XP-08B	AL-SG-035XP-08C	AL-SG-035XP-09A	AL-SG-035XP-09B	AL-SG-035XP-09C
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u
Lead (K)	0.466u	0.466u	0.466u	0.466u	0.466u	0.466u

SAMPLE ID	AL-SG-036XP-01A	AL-SG-036XP-01B	AL-SG-036XP-01C	AL-SG-036XP-02A	AL-SG-036XP-02B	AL-SG-036XP-02C
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u
Lead (K)	1.28u	1.28u	1.28u	1.28u	1.28u	1.28u

SAMPLE ID	AL-SG-036XP-03A	AL-SG-036XP-03B	AL-SG-036XP-03C	AL-SG-037XP-01A	AL-SG-037XP-01B	AL-SG-037XP-01C
Date of Analysis	4-25-94	4-25-94	4-25-94	4-26-94	4-26-94	4-26-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0895u	0.0895u	0.0895u
Lead (K)	[0.285]	1.28u	[0.497]	1.05u	1.05u	1.05u

SAMPLE ID	AL-SG-037XP-02A	AL-SG-037XP-02B	AL-SG-037XP-02C	AL-SG-037XP-03A	AL-SG-037XP-03B	AL-SG-037XP-03C
Date of Analysis	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0895u	0.0895u	0.0895u	0.2981	0.2493	0.1702
Lead (K)	1.05u	1.05u	1.05u	2.2668	3.1005	2.8647

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0464

TABLE Q-7 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN BACKGROUND RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-037XP-04A	AL-SG-037XP-04B	AL-SG-037XP-04C	AL-SG-037XP-05A	AL-SG-037XP-05B	AL-SG-037XP-05C
Date of Analysis	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0895u	0.0895u	0.0895u	0.0895u	0.0895u	0.0895u
Lead (K)	1.05u	1.05u	1.05u	1.05u	1.05u	1.05u

SAMPLE ID	AL-SG-037XP-06A	AL-SG-037XP-06B	AL-SG-037XP-06C	AL-SG-037XP-07A	AL-SG-037XP-07B	AL-SG-037XP-07C
Date of Analysis	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0895u	0.0895u	0.0895u	0.0895u	0.0895u	0.0895u
Lead (K)	1.05u	1.05u	1.05u	1.05u	1.05u	1.05u

SAMPLE ID	AL-SG-037XP-08A	AL-SG-037XP-08B	AL-SG-037XP-08C	AL-SG-037XP-09A	AL-SG-037XP-09B	AL-SG-037XP-09C
Date of Analysis	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0895u	0.0895u	0.0895u	0.0895u	0.0895u	0.0895u
Lead (K)	1.05u	1.05u	1.05u	[0.145]	[0.630]	[0.682]

SAMPLE ID	AL-SG-038XP-01A	AL-SG-038XP-01B	AL-SG-038XP-01C	AL-SG-038XP-02A	AL-SG-038XP-02B	AL-SG-038XP-02C
Date of Analysis	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.128u	0.128u	0.128u	0.128u
Lead (K)	1.71u	1.71u	1.71u	[0.152]	[0.517]	[0.440]

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0465

TABLE Q-7 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN BACKGROUND RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-038XP-03A	AL-SG-038XP-03B	AL-SG-038XP-03C	AL-SG-038XP-04A	AL-SG-038XP-04B	AL-SG-038XP-04C
Date of Analysis	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.1444	0.1544	0.1558	0.1668
Lead (K)	[0.384]	[0.459]	[0.440]	[0.294]	[0.459]	[0.220]

SAMPLE ID	AL-SG-038XP-05A	AL-SG-038XP-05B	AL-SG-038XP-05C	AL-SG-038XP-06A	AL-SG-038XP-06B	AL-SG-038XP-06C
Date of Analysis	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.128u	[0.322]	[0.239]	[0.504]
Lead (K)	[0.223]	[0.239]	[0.404]	1.71u	1.71u	1.71u

SAMPLE ID	AL-SG-038XP-07A	AL-SG-038XP-07B	AL-SG-038XP-07C	AL-SG-038XP-08A	AL-SG-038XP-08B	AL-SG-038XP-08C
Date of Analysis	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.128u	0.128u	0.128u	0.128u
Lead (K)	1.71u	1.71u	1.71u	1.71u	1.71u	1.71u

SAMPLE ID	AL-SG-038XP-09A	AL-SG-038XP-09B	AL-SG-038XP-09C	AL-SG-038XP-10A	AL-SG-038XP-10B	AL-SG-038XP-10C
Date of Analysis	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.128u	0.128u	0.128u	0.128u
Lead (K)	2.3817	2.6580	2.9411	2.0436	4.1867	3.2805

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0466

TABLE Q-8
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-001XP-01A	AL-SG-001XP-01B	AL-SG-001XP-01C	AL-SG-001XP-02A	AL-SG-001XP-02B	AL-SG-001XP-02C
Date of Analysis	4-8-94	4-8-94	4-8-94	4-8-94	4-8-94	4-8-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0276u	0.0276u	0.0276u	0.0280	0.0276u	0.0276u
Lead (K)	1.33u	1.33u	1.33u	1.33u	1.33u	1.33u

SAMPLE ID	AL-SG-001XP-03A	AL-SG-001XP-03B	AL-SG-001XP-03C	AL-SG-001XP-04A	AL-SG-001XP-04B	AL-SG-001XP-04C
Date of Analysis	4-8-94	4-8-94	4-8-94	4-8-94	4-8-94	4-8-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0276u	0.0276u	0.0276u	0.0276u	0.0276u	0.0297
Lead (K)	1.33u	1.33u	1.33u	1.33u	1.33u	1.33u

SAMPLE ID	AL-SG-001XP-05A	AL-SG-001XP-05B	AL-SG-001XP-05C	AL-SG-001XP-06A	AL-SG-001XP-06B	AL-SG-001XP-06C
Date of Analysis	4-8-94	4-8-94	4-8-94	4-8-94	4-8-94	4-8-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0276u	0.0276u	0.0276u	0.0276u	0.0276u	0.0276u
Lead (K)	1.33u	1.33u	1.33u	1.33u	1.33u	1.33u

SAMPLE ID	AL-SG-002XP-01A	AL-SG-002XP-01B	AL-SG-002XP-01C	AL-SG-002XP-02A	AL-SG-002XP-02B	AL-SG-002XP-02C
Date of Analysis	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u
Lead (K)	1.62u	1.62u	1.62u	1.62u	1.62u	1.62u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0467

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-002XP-03A	AL-SG-002XP-03B	AL-SG-002XP-03C	AL-SG-002XP-04A	AL-SG-002XP-04B	AL-SG-002XP-04C
Date of Analysis	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u
Lead (K)	1.62u	1.62u	1.62u	1.62u	1.62u	1.62u

SAMPLE ID	AL-SG-002XP-05A	AL-SG-002XP-05B	AL-SG-002XP-05C	AL-SG-002XP-06A	AL-SG-002XP-06B	AL-SG-002XP-06C
Date of Analysis	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u
Lead (K)	1.62u	1.62u	1.62u	1.62u	1.62u	1.62u

SAMPLE ID	AL-SG-003XP-01A	AL-SG-003XP-01B	AL-SG-003XP-01C	AL-SG-003XP-02A	AL-SG-003XP-02B	AL-SG-003XP-02C
Date of Analysis	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u
Lead (K)	1.62u	1.62u	1.62u	1.62u	1.62u	1.62u

SAMPLE ID	AL-SG-003XP-03A	AL-SG-003XP-03B	AL-SG-003XP-03C	AL-SG-003XP-04A	AL-SG-003XP-04B	AL-SG-003XP-04C
Date of Analysis	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u
Lead (K)	1.62u	1.62u	1.62u	1.62u	1.62u	1.62u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0468

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-003XP-05A	AL-SG-003XP-05B	AL-SG-003XP-05C	AL-SG-003XP-06A	AL-SG-003XP-06B	AL-SG-003XP-06C
Date of Analysis	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94	4-9-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u	0.0676u
Lead (K)	1.62u	1.62u	1.62u	1.62u	1.62u	1.62u

SAMPLE ID	AL-SG-004XP-01A	AL-SG-004XP-01B	AL-SG-004XP-01C	AL-SG-004XP-02A	AL-SG-004XP-02B	AL-SG-004XP-02C
Date of Analysis	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u
Lead (K)	1.26u	1.26u	1.26u	1.26u	1.26u	1.26u

SAMPLE ID	AL-SG-004XP-03A	AL-SG-004XP-03B	AL-SG-004XP-03C	AL-SG-004XP-04A	AL-SG-004XP-04B	AL-SG-004XP-04C
Date of Analysis	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u
Lead (K)	1.26u	1.26u	1.26u	1.26u	1.26u	1.26u

SAMPLE ID	AL-SG-004XP-05A	AL-SG-004XP-05B	AL-SG-004XP-05C	AL-SG-004XP-06A	AL-SG-004XP-06B	AL-SG-004XP-06C
Date of Analysis	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u
Lead (K)	1.26u	1.26u	1.26u	1.26u	1.26u	1.26u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0469

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-004XP-07A	AL-SG-004XP-07B	AL-SG-004XP-07C	AL-SG-005XP-01A	AL-SG-005XP-01B	AL-SG-005XP-01C
Date of Analysis	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u
Lead (K)	1.26u	1.26u	1.26u	1.26u	1.26u	1.26u

SAMPLE ID	AL-SG-005XP-02A	AL-SG-005XP-02B	AL-SG-005XP-02C	AL-SG-005XP-03A	AL-SG-005XP-03B	AL-SG-005XP-03C
Date of Analysis	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u
Lead (K)	1.26u	1.26u	1.26u	1.26u	1.26u	1.26u

SAMPLE ID	AL-SG-005XP-04A	AL-SG-005XP-04B	AL-SG-005XP-04C	AL-SG-005XP-05A	AL-SG-005XP-05B	AL-SG-005XP-05C
Date of Analysis	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94	4-11-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u	0.0163u
Lead (K)	1.26u	1.26u	1.26u	1.26u	1.26u	1.26u

SAMPLE ID	AL-SG-005XP-06A	AL-SG-005XP-06B	AL-SG-006XP-01A	AL-SG-006XP-01B	AL-SG-006XP-01C	AL-SG-006XP-02A
Date of Analysis	4-11-94	4-11-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0163u	0.0163u	0.017u	0.017u	0.017u	0.017u
Lead (K)	1.26u	1.26u	0.985u	0.985u	0.985u	0.985u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0470

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-006XP-02B	AL-SG-006XP-02C	AL-SG-006XP-03A	AL-SG-006XP-03B	AL-SG-006XP-03C	AL-SG-006XP-04A
Date of Analysis	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.017u	0.017u	0.0243	0.0234	0.0285	0.0384
Lead (K)	0.985u	0.985u	0.985u	0.985u	0.985u	0.985u

SAMPLE ID	AL-SG-006XP-04B	AL-SG-006XP-04C	AL-SG-006XP-05A	AL-SG-006XP-05B	AL-SG-006XP-05C	AL-SG-006XP-06A
Date of Analysis	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0451	0.0399	0.017u	0.017u	0.017u	0.1346
Lead (K)	0.985u	0.985u	0.985u	0.985u	0.985u	0.985u

SAMPLE ID	AL-SG-006XP-06B	AL-SG-006XP-06C	AL-SG-006XP-07A	AL-SG-006XP-07B	AL-SG-006XP-07C	AL-SG-006XP-08A
Date of Analysis	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1761	0.1569	0.017u	0.017u	0.017u	0.017u
Lead (K)	[0.672]	[0.579]	0.985u	0.985u	0.985u	0.985u

SAMPLE ID	AL-SG-006XP-08B	AL-SG-006XP-08C	AL-SG-007XP-01A	AL-SG-007XP-01B	AL-SG-007XP-01C	AL-SG-007XP-02A
Date of Analysis	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.017u	0.017u	0.017u	0.017u	0.017u	0.017u
Lead (K)	0.985u	0.985u	0.985u	0.985u	0.985u	0.985u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0471

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-007XP-02B	AL-SG-007XP-02C	AL-SG-007XP-03A	AL-SG-007XP-03B	AL-SG-007XP-03C	AL-SG-007XP-04A
Date of Analysis	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.017u	0.017u	0.017u	0.0239	0.0226	0.017u
Lead (K)	0.985u	0.985u	0.985u	0.985u	0.985u	0.985u

SAMPLE ID	AL-SG-007XP-04B	AL-SG-007XP-04C	AL-SG-007XP-05A	AL-SG-007XP-05B	AL-SG-007XP-05C	AL-SG-007XP-06A
Date of Analysis	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.017u	0.017u	0.3963	0.2799	0.2878	0.1841
Lead (K)	0.985u	0.985u	1.0822	[0.154]	[0.684]	[0.291]

SAMPLE ID	AL-SG-007XP-06B	AL-SG-007XP-06C	AL-SG-007XP-07A	AL-SG-007XP-07B	AL-SG-007XP-07C	AL-SG-007XP-08A
Date of Analysis	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94	4-12-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1393	0.2474	0.017u	0.017u	0.017u	0.017u
Lead (K)	[0.100]	[0.457]	0.985u	0.985u	0.985u	0.985u

SAMPLE ID	AL-SG-007XP-08B	AL-SG-008XP-01A	AL-SG-008XP-01B	AL-SG-008XP-01C	AL-SG-008XP-02A	AL-SG-008XP-02B
Date of Analysis	4-12-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.017u	0.1435	0.1982	0.1908	0.3225	0.2207
Lead (K)	0.985u	[0.882]	[0.421]	[0.327]	[0.453]	[0.434]

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0472

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-008XP-02C	AL-SG-008XP-03A	AL-SG-008XP-03B	AL-SG-008XP-03C	AL-SG-008XP-04A	AL-SG-008XP-04B
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1600	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	[0.110]	1.14u	1.14u	1.14u	1.14u	1.14u

SAMPLE ID	AL-SG-008XP-04C	AL-SG-008XP-05A	AL-SG-008XP-05B	AL-SG-008XP-05C	AL-SG-008XP-06A	AL-SG-008XP-06B
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.1021	0.1229	0.0985	0.0359u	0.0359u
Lead (K)	1.14u	[0.992]	[0.791]	[0.397]	1.14u	1.14u

SAMPLE ID	AL-SG-008XP-06C	AL-SG-008XP-07A	AL-SG-008XP-07B	AL-SG-008XP-07C	AL-SG-008XP-08A	AL-SG-008XP-08B
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.14u

SAMPLE ID	AL-SG-008XP-08C	AL-SG-008XP-09A	AL-SG-008XP-09B	AL-SG-008XP-09C	AL-SG-009XP-01A	AL-SG-009XP-01B
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.14u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0473

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-009XP-01C	AL-SG-009XP-02A	AL-SG-009XP-02B	AL-SG-009XP-02C	AL-SG-009XP-03A	AL-SG-009XP-03B
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.14u

SAMPLE ID	AL-SG-009XP-03C	AL-SG-009XP-04A	AL-SG-009XP-04B	AL-SG-009XP-04C	AL-SG-009XP-05A	AL-SG-009XP-05B
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.14u

SAMPLE ID	AL-SG-009XP-05C	AL-SG-009XP-06A	AL-SG-009XP-06B	AL-SG-009XP-06C	AL-SG-009XP-07A	AL-SG-009XP-07B
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.1059	0.1526
Lead (K)	1.14u	1.14u	1.14u	1.14u	[0.255]	[0.893]

SAMPLE ID	AL-SG-009XP-07C	AL-SG-009XP-08A	AL-SG-009XP-08B	AL-SG-009XP-08C	AL-SG-008PC-02	AL-SG-010XP-01A
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1121	0.2062	0.2137	0.1728	0.0715	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.2286	1.14u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0474

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-010XP-01B	AL-SG-010XP-01C	AL-SG-010XP-02A	AL-SG-010XP-02B	AL-SG-010XP-02C	AL-SG-010XP-03A
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.14u

SAMPLE ID	AL-SG-010XP-03B	AL-SG-010XP-03C	AL-SG-010XP-04A	AL-SG-010XP-04B	AL-SG-010XP-04C	AL-SG-010XP-05A
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.14u

SAMPLE ID	AL-SG-010XP-05B	AL-SG-010XP-05C	AL-SG-010XP-06A	AL-SG-010XP-06B	AL-SG-010XP-06C	AL-SG-010XP-07A
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.1021
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	[0.119]

SAMPLE ID	AL-SG-010XP-07B	AL-SG-010XP-07C	AL-SG-010XP-08A	AL-SG-010XP-08B	AL-SG-010XP-08C	AL-SG-010XP-09A
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1613	0.1221	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	[0.734]	[0.573]	1.14u	1.14u	1.14u	1.14u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0475

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-010XP-09B	AL-SG-010XP-09C	AL-SG-010XP-10A	AL-SG-010XP-10B	AL-SG-010XP-10C	AL-SG-010XP-11A
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.14u

SAMPLE ID	AL-SG-010XP-11B	AL-SG-010XP-11C	AL-SG-010XP-12A	AL-SG-010XP-12B	AL-SG-010XP-12C	AL-SG-011XP-01A
Date of Analysis	4-13-94	4-13-94	4-13-94	4-13-94	4-13-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0359u	0.0359u	0.0359u	0.0359u	0.0359u	0.0383u
Lead (K)	1.14u	1.14u	1.14u	1.14u	1.14u	1.44u

SAMPLE ID	AL-SG-011XP-01B	AL-SG-011XP-01C	AL-SG-011XP-02A	AL-SG-011XP-02B	AL-SG-011XP-02C	AL-SG-011XP-03A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

SAMPLE ID	AL-SG-011XP-03B	AL-SG-011XP-03C	AL-SG-011XP-04A	AL-SG-011XP-04B	AL-SG-011XP-04C	AL-SG-011XP-05A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0476

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-011XP-05B	AL-SG-011XP-05C	AL-SG-011XP-06A	AL-SG-011XP-06B	AL-SG-011XP-06C	AL-SG-011XP-07A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

SAMPLE ID	AL-SG-011XP-07B	AL-SG-011XP-07C	AL-SG-011XP-08A	AL-SG-011XP-08B	AL-SG-011XP-08C	AL-SG-011XP-09A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

SAMPLE ID	AL-SG-011XP-09B	AL-SG-011XP-09C	AL-SG-012XP-01A	AL-SG-012XP-01B	AL-SG-012XP-01C	AL-SG-012XP-02A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

SAMPLE ID	AL-SG-012XP-02B	AL-SG-012XP-02C	AL-SG-012XP-03A	AL-SG-012XP-03B	AL-SG-012XP-03C	AL-SG-012XP-04A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0477

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-012XP-04B	AL-SG-012XP-04C	AL-SG-012XP-05A	AL-SG-012XP-05B	AL-SG-012XP-05C	AL-SG-012XP-06A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

SAMPLE ID	AL-SG-012XP-06B	AL-SG-012XP-06C	AL-SG-012XP-07A	AL-SG-012XP-07B	AL-SG-012XP-07C	AL-SG-012XP-08A
Date of Analysis	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94	4-14-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u	0.0383u
Lead (K)	1.44u	1.44u	1.44u	1.44u	1.44u	1.44u

SAMPLE ID	AL-SG-012XP-08B	AL-SG-012XP-08C	AL-SG-013XP-01A	AL-SG-013XP-01B	AL-SG-013XP-01C	AL-SG-013XP-02A
Date of Analysis	4-14-94	4-14-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0383u	0.0383u	0.2450	0.2378	0.3094	0.0560u
Lead (K)	1.44u	1.44u	[1.02]	[0.634]	[0.925]	1.30u

SAMPLE ID	AL-SG-013XP-02B	AL-SG-013XP-02C	AL-SG-013XP-03A	AL-SG-013XP-03B	AL-SG-013XP-03C	AL-SG-013XP-04A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u
Lead (K)	1.30u	1.30u	1.30u	1.30u	1.30u	1.30u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0478

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-013XP-04B	AL-SG-013XP-04C	AL-SG-013XP-05A	AL-SG-013XP-05B	AL-SG-013XP-05C	AL-SG-013XP-06A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0560u	0.0560u	0.1821	0.1602	0.2700	0.0771
Lead (K)	1.30u	1.30u	[0.728]	[0.484]	[0.501]	1.30u

SAMPLE ID	AL-SG-013XP-06B	AL-SG-013XP-06C	AL-SG-013XP-07A	AL-SG-013XP-07B	AL-SG-013XP-07C	AL-SG-013XP-08A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0955	0.1127	0.0560u	0.0560u	0.0560u	0.0560u
Lead (K)	1.30u	[0.376]	1.30u	1.30u	1.30u	1.30u

SAMPLE ID	AL-SG-013XP-08B	AL-SG-013XP-08C	AL-SG-013XP-09A	AL-SG-013XP-09B	AL-SG-013XP-09C	AL-SG-013XP-10A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u
Lead (K)	1.30u	1.30u	1.30u	1.30u	1.30u	1.30u

SAMPLE ID	AL-SG-013XP-10B	AL-SG-013XP-10C	AL-SG-014XP-01A	AL-SG-014XP-01B	AL-SG-014XP-01C	AL-SG-014XP-02A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u
Lead (K)	1.30u	1.30u	1.30u	1.30u	1.30u	1.30u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0479

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-014XP-02B	AL-SG-014XP-02C	AL-SG-014XP-03A	AL-SG-014XP-03B	AL-SG-014XP-03C	AL-SG-014XP-04A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u
Lead (K)	1.30u	1.30u	1.30u	1.30u	1.30u	1.30u

SAMPLE ID	AL-SG-014XP-04B	AL-SG-014XP-04C	AL-SG-014XP-05A	AL-SG-014XP-05B	AL-SG-014XP-05C	AL-SG-014XP-06A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u
Lead (K)	1.30u	1.30u	1.30u	1.30u	1.30u	1.30u

SAMPLE ID	AL-SG-014XP-06B	AL-SG-014XP-06C	AL-SG-014XP-07A	AL-SG-014XP-07B	AL-SG-014XP-07C	AL-SG-015XP-01A
Date of Analysis	4-15-94	4-15-94	4-15-94	4-15-94	4-15-94	4-16-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0560u	0.0560u	0.0560u	0.0560u	0.0560u	0.0432u
Lead (K)	1.30u	1.30u	1.30u	1.30u	1.30u	1.04u

SAMPLE ID	AL-SG-015XP-01B	AL-SG-015XP-01C	AL-SG-015XP-02A	AL-SG-015XP-02B	AL-SG-015XP-02C	AL-SG-015XP-03A
Date of Analysis	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u
Lead (K)	1.04u	1.04u	1.04u	1.04u	1.04u	1.04u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0480

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-015XP-03B	AL-SG-015XP-03C	AL-SG-015XP-04A	AL-SG-015XP-04B	AL-SG-015XP-04C	AL-SG-015XP-05A
Date of Analysis	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u
Lead (K)	1.04u	1.04u	1.04u	1.04u	1.04u	1.04u

SAMPLE ID	AL-SG-015XP-05B	AL-SG-015XP-05C	AL-SG-015XP-06A	AL-SG-015XP-06B	AL-SG-015XP-06C	AL-SG-015XP-07A
Date of Analysis	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u
Lead (K)	1.04u	1.04u	1.04u	1.04u	1.04u	1.04u

SAMPLE ID	AL-SG-015XP-07B	AL-SG-015XP-07C	AL-SG-016XP-01A	AL-SG-016XP-01B	AL-SG-016XP-01C	AL-SG-016XP-02A
Date of Analysis	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u
Lead (K)	1.04u	1.04u	1.04u	1.04u	1.04u	1.04u

SAMPLE ID	AL-SG-016XP-02B	AL-SG-016XP-02C	AL-SG-016XP-03A	AL-SG-016XP-03B	AL-SG-016XP-03C	AL-SG-016XP-04A
Date of Analysis	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u
Lead (K)	1.04u	1.04u	1.04u	1.04u	1.04u	1.04u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0481

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-016XP-04B	AL-SG-016XP-04C	AL-SG-016XP-05A	AL-SG-016XP-05B	AL-SG-016XP-05C	AL-SG-017XP-01A
Date of Analysis	4-16-94	4-16-94	4-16-94	4-16-94	4-16-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0432u	0.0432u	0.0432u	0.0432u	0.0432u	0.1581
Lead (K)	1.04u	1.04u	1.04u	1.04u	1.04u	0.7888

SAMPLE ID	AL-SG-017XP-01B	AL-SG-017XP-01C	AL-SG-017XP-02A	AL-SG-017XP-02B	AL-SG-017XP-02C	AL-SG-017XP-03A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1656	0.1555	0.0442	0.0693	0.0673	0.0360u
Lead (K)	0.6931	[0.345]	[0.570]	[0.440]	0.6674	0.626u

SAMPLE ID	AL-SG-017XP-03B	AL-SG-017XP-03C	AL-SG-017XP-04A	AL-SG-017XP-04B	AL-SG-017XP-04C	AL-SG-017XP-05A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

SAMPLE ID	AL-SG-017XP-05B	AL-SG-017XP-05C	AL-SG-017XP-06A	AL-SG-017XP-06B	AL-SG-017XP-06C	AL-SG-017XP-07A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0482

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-017XP-07B	AL-SG-017XP-07C	AL-SG-017XP-08A	AL-SG-017XP-08B	AL-SG-017XP-08C	AL-SG-017XP-09A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0685	0.1303	0.1135	0.0360u
Lead (K)	0.626u	0.626u	0.626u	[0.574]	[0.488]	0.626u

SAMPLE ID	AL-SG-017XP-09B	AL-SG-017XP-09C	AL-SG-017XP-10A	AL-SG-017XP-10B	AL-SG-017XP-10C	AL-SG-017XP-11A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

SAMPLE ID	AL-SG-017XP-11B	AL-SG-017XP-11C	AL-SG-017XP-12A	AL-SG-017XP-12B	AL-SG-017XP-12C	AL-SG-017XP-13A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

SAMPLE ID	AL-SG-017XP-13B	AL-SG-017XP-13C	AL-SG-018XP-01A	AL-SG-018XP-01B	AL-SG-018XP-01C	AL-SG-018XP-02A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-018XP-02B	AL-SG-018XP-02C	AL-SG-018XP-03A	AL-SG-018XP-03B	AL-SG-018XP-03C	AL-SG-018XP-04A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

SAMPLE ID	AL-SG-018XP-04B	AL-SG-018XP-04C	AL-SG-018XP-05A	AL-SG-018XP-05B	AL-SG-018XP-05C	AL-SG-018XP-06A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

SAMPLE ID	AL-SG-018XP-06B	AL-SG-018XP-06C	AL-SG-018XP-07A	AL-SG-018XP-07B	AL-SG-018XP-07C	AL-SG-018XP-08A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

SAMPLE ID	AL-SG-018XP-08B	AL-SG-018XP-08C	AL-SG-018XP-09A	AL-SG-018XP-09B	AL-SG-018XP-09C	AL-SG-018XP-10A
Date of Analysis	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94	4-18-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u	0.0360u
Lead (K)	0.626u	0.626u	0.626u	0.626u	0.626u	0.626u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-018XP-10B	AL-SG-018XP-10C	AL-SG-019XP-01A	AL-SG-019XP-01B	AL-SG-019XP-01C	AL-SG-019XP-02A
Date of Analysis	4-18-94	4-18-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0360u	0.0360u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.626u	0.626u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-019XP-02B	AL-SG-019XP-02C	AL-SG-019XP-03A	AL-SG-019XP-03B	AL-SG-019XP-03C	AL-SG-019XP-04A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-019XP-04B	AL-SG-019XP-04C	AL-SG-019XP-05A	AL-SG-019XP-05B	AL-SG-019XP-05C	AL-SG-019XP-06A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-019XP-06B	AL-SG-019XP-06C	AL-SG-019XP-07A	AL-SG-019XP-07B	AL-SG-019XP-07C	AL-SG-019XP-08A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-019XP-08B	AL-SG-019XP-08C	AL-SG-019XP-09A	AL-SG-019XP-09B	AL-SG-019XP-09C	AL-SG-020XP-01A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-020XP-01B	AL-SG-020XP-01C	AL-SG-020XP-02A	AL-SG-020XP-02B	AL-SG-020XP-02C	AL-SG-020XP-03A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-020XP-03B	AL-SG-020XP-03C	AL-SG-020XP-04A	AL-SG-020XP-04B	AL-SG-020XP-04C	AL-SG-020XP-05A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.1812
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.6456

SAMPLE ID	AL-SG-020XP-05B	AL-SG-020XP-05C	AL-SG-020XP-06A	AL-SG-020XP-06B	AL-SG-020XP-06C	AL-SG-020XP-07A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1432	0.1474	0.0490u	0.0490u	0.0490u	0.0941
Lead (K)	[0.240]	0.8332	0.583u	0.583u	0.583u	0.583u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-020XP-07B	AL-SG-020XP-07C	AL-SG-020XP-08A	AL-SG-020XP-08B	AL-SG-020XP-08C	AL-SG-020XP-09A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0496	0.0673	0.1298	0.1156	0.0490u
Lead (K)	0.583u	0.583u	[0.221]	[0.553]	[0.432]	0.583u

SAMPLE ID	AL-SG-020XP-09B	AL-SG-020XP-09C	AL-SG-020XP-10A	AL-SG-020XP-10B	AL-SG-020XP-10C	AL-SG-020XP-11A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-020XP-11B	AL-SG-020XP-11C	AL-SG-021XP-01A	AL-SG-021XP-01B	AL-SG-021XP-01C	AL-SG-021XP-02A
Date of Analysis	4-19-94	4-19-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0467u	0.0467u	0.0467u	0.0467u
Lead (K)	0.583u	0.583u	0.723u	0.723u	0.723u	0.723u

SAMPLE ID	AL-SG-021XP-02B	AL-SG-021XP-02C	AL-SG-021XP-03A	AL-SG-021XP-03B	AL-SG-021XP-03C	AL-SG-021XP-04A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	0.723u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-021XP-04B	AL-SG-021XP-04C	AL-SG-021XP-05A	AL-SG-021XP-05B	AL-SG-021XP-05C	AL-SG-021XP-06A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	0.723u

SAMPLE ID	AL-SG-021XP-06B	AL-SG-021XP-06C	AL-SG-022XP-01A	AL-SG-022XP-01B	AL-SG-022XP-01C	AL-SG-022XP-02A
Date of Analysis	4-20-94	4-20-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.723u	0.723u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-022XP-02B	AL-SG-022XP-02C	AL-SG-022XP-03A	AL-SG-022XP-03B	AL-SG-022XP-03C	AL-SG-022XP-04A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

SAMPLE ID	AL-SG-022XP-04B	AL-SG-022XP-04C	AL-SG-022XP-05A	AL-SG-022XP-05B	AL-SG-022XP-05C	AL-SG-022XP-06A
Date of Analysis	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94	4-19-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u	0.0490u
Lead (K)	0.583u	0.583u	0.583u	0.583u	0.583u	0.583u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-022XP-06B	AL-SG-022XP-06C	AL-SG-023XP-01A	AL-SG-023XP-01B	AL-SG-023XP-01C	AL-SG-023XP-02A
Date of Analysis	4-19-94	4-19-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0490u	0.0490u	0.0467u	0.0467u	0.0467u	0.0467u
Lead (K)	0.583u	0.583u	0.723u	0.723u	0.723u	0.723u

SAMPLE ID	AL-SG-023XP-02B	AL-SG-023XP-02C	AL-SG-023XP-03A	AL-SG-023XP-03B	AL-SG-023XP-03C	AL-SG-023XP-04A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	0.723u

SAMPLE ID	AL-SG-023XP-04B	AL-SG-023XP-04C	AL-SG-023XP-05A	AL-SG-023XP-05B	AL-SG-023XP-05C	AL-SG-023XP-06A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	0.723u

SAMPLE ID	AL-SG-023XP-06B	AL-SG-023XP-06C	AL-SG-024XP-01A	AL-SG-024XP-01B	AL-SG-024XP-01C	AL-SG-024XP-02A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0503	0.0467u	0.0467u	0.0467u
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	0.723u

u - Analyte is undetected. Reported value is the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0489

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-024XP-02B	AL-SG-024XP-02C	AL-SG-024XP-03A	AL-SG-024XP-03B	AL-SG-024XP-03C	AL-SG-024XP-04A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u	0.0927
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	[0.424]

SAMPLE ID	AL-SG-024XP-04B	AL-SG-024XP-04C	AL-SG-024XP-05A	AL-SG-024XP-05B	AL-SG-024XP-05C	AL-SG-024XP-06A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1060	0.1397	0.1145	0.1234	0.1198	0.0467u
Lead (K)	[0.344]	[0.297]	0.9051	0.7552	[0.705]	0.723u

SAMPLE ID	AL-SG-024XP-06B	AL-SG-024XP-06C	AL-SG-024XP-07A	AL-SG-024XP-07B	AL-SG-024XP-07C	AL-SG-024XP-08A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	0.723u

SAMPLE ID	AL-SG-024XP-08B	AL-SG-024XP-08C	AL-SG-024XP-09A	AL-SG-024XP-09B	AL-SG-024XP-09C	AL-SG-024XP-10A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0467u	0.0467u	0.0467u	0.0467u	0.0467u	0.1142
Lead (K)	0.723u	0.723u	0.723u	0.723u	0.723u	0.9555

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0490

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-024XP-10B	AL-SG-024XP-10C	AL-SG-024XP-11A	AL-SG-024XP-11B	AL-SG-024XP-11C	AL-SG-025XP-01A
Date of Analysis	4-20-94	4-20-94	4-20-94	4-20-94	4-20-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0972	0.0727	0.0467u	0.0467u	0.0467u	0.0966u
Lead (K)	0.7535	[0.629]	0.723u	0.723u	0.723u	1.28u

SAMPLE ID	AL-SG-025XP-01B	AL-SG-025XP-01C	AL-SG-025XP-02A	AL-SG-025XP-02B	AL-SG-025XP-02C	AL-SG-025XP-03A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u
Lead (K)	1.28u	1.28u	1.28u	1.28u	1.28u	1.28u

SAMPLE ID	AL-SG-025XP-03B	AL-SG-025XP-03C	AL-SG-025XP-04A	AL-SG-025XP-04B	AL-SG-025XP-04C	AL-SG-025XP-05A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u
Lead (K)	1.28u	1.28u	1.28u	1.28u	1.28u	1.28u

SAMPLE ID	AL-SG-025XP-05B	AL-SG-025XP-05C	AL-SG-025XP-06A	AL-SG-025XP-06B	AL-SG-025XP-06C	AL-SG-027XP-01A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.0517u
Lead (K)	1.28u	1.28u	1.28u	1.28u	1.28u	1.51u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0491

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-027XP-01B	AL-SG-027XP-01C	AL-SG-027XP-02A	AL-SG-027XP-02B	AL-SG-027XP-02C	AL-SG-027XP-03A
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0517u	0.0517u	0.0517u	0.0517u	0.0517u	0.0517u
Lead (K)	1.51u	1.51u	1.51u	1.51u	1.51u	1.51u

SAMPLE ID	AL-SG-027XP-03B	AL-SG-027XP-03C	AL-SG-027XP-04A	AL-SG-027XP-04B	AL-SG-027XP-04C	AL-SG-027XP-05A
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0517u	0.0517u	0.0517u	0.0517u	0.0517u	0.0517u
Lead (K)	1.51u	1.51u	1.51u	1.51u	1.51u	1.51u

SAMPLE ID	AL-SG-027XP-05B	AL-SG-027XP-05C	AL-SG-027XP-06A	AL-SG-027XP-06B	AL-SG-027XP-06C	AL-SG-027XP-07A
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0517u	0.0517u	0.0517u	0.0517u	0.0517u	0.1859
Lead (K)	1.51u	1.51u	1.51u	1.51u	1.51u	[0.948]

SAMPLE ID	AL-SG-027XP-07B	AL-SG-027XP-07C	AL-SG-027XP-08A	AL-SG-027XP-08B	AL-SG-027XP-08C	AL-SG-027XP-09A
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1122	0.0517u	0.0517u	0.0517u	0.0517u	0.1191
Lead (K)	[1.04]	[0.481]	1.51u	1.51u	1.51u	[0.434]

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0492

TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-027XP-09B	AL-SG-027XP-09C	AL-SG-027XP-10A	AL-SG-027XP-10B	AL-SG-027XP-10C	AL-SG-027XP-11A
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0898	0.0969	0.0517u	0.0517u	0.0517u	0.2342
Lead (K)	[0.664]	[0.870]	1.51u	1.51u	1.51u	[0.754]

SAMPLE ID	AL-SG-027XP-11B	AL-SG-027XP-11C	AL-SG-027XP-12A	AL-SG-027XP-12B	AL-SG-027XP-12A	AL-SG-028XP-01A
Date of Analysis	4-21-94	4-21-94	4-21-94	4-21-94	4-21-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.2788	0.1649	0.0517u	0.0517u	0.0517u	0.0332u
Lead (K)	[0.704]	[0.715]	1.51u	1.51u	1.51u	0.466u

SAMPLE ID	AL-SG-028XP-01B	AL-SG-028XP-01C	AL-SG-028XP-02A	AL-SG-028XP-02B	AL-SG-028XP-02C	AL-SG-028XP-03A
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u
Lead (K)	0.466u	0.466u	0.466u	0.5461	0.466u	0.466u

SAMPLE ID	AL-SG-028XP-03B	AL-SG-028XP-03C	AL-SG-028XP-04A	AL-SG-028XP-04B	AL-SG-028XP-04C	AL-SG-028XP-05A
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u
Lead (K)	0.466u	0.466u	0.466u	0.466u	0.466u	0.466u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-028XP-05B	AL-SG-028XP-05C	AL-SG-028XP-06A	AL-SG-028XP-06B	AL-SG-028XP-06C	AL-SG-028XP-07A
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u
Lead (K)	0.466u	0.466u	0.466u	0.466u	0.466u	0.466u

SAMPLE ID	AL-SG-028XP-07B	AL-SG-028XP-07C	AL-SG-028XP-08A	AL-SG-028XP-08B	AL-SG-028XP-08C	AL-SG-029XP-01A
Date of Analysis	4-23-94	4-23-94	4-23-94	4-23-94	4-23-94	4-24-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0332u	0.0332u	0.0332u	0.0332u	0.0332u	0.0537u
Lead (K)	0.466u	0.466u	0.466u	0.466u	0.466u	0.694u

SAMPLE ID	AL-SG-029XP-01B	AL-SG-029XP-01C	AL-SG-029XP-02A	AL-SG-029XP-02B	AL-SG-029XP-02C	AL-SG-029XP-03A
Date of Analysis	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0537u	0.0537u	0.0537u	0.0537u	0.0537u	0.0537u
Lead (K)	0.694u	0.694u	0.694u	0.694u	0.694u	0.694u

SAMPLE ID	AL-SG-029XP-03B	AL-SG-029XP-03C	AL-SG-029XP-04A	AL-SG-029XP-04B	AL-SG-029XP-04C	AL-SG-029XP-05A
Date of Analysis	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0537u	0.0537u	0.0537u	0.0537u	0.0537u	0.1617
Lead (K)	0.694u	0.694u	0.694u	0.694u	0.694u	[0.616]

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-029XP-05B	AL-SG-029XP-05C	AL-SG-029XP-06A	AL-SG-029XP-06B	AL-SG-029XP-06C	AL-SG-029XP-07A
Date of Analysis	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1344	0.1536	0.1056	0.0616	0.0833	0.0537u
Lead (K)	[0.689]	[0.453]	[0.523]	[0.655]	[0.539]	0.694u

SAMPLE ID	AL-SG-029XP-07B	AL-SG-029XP-07C	AL-SG-029XP-08A	AL-SG-029XP-08B	AL-SG-029XP-08C	AL-SG-029XP-09A
Date of Analysis	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0851	0.0779	0.0537u	0.0537u	0.0537u	0.0537u
Lead (K)	0.694u	0.694u	0.694u	0.694u	0.694u	0.694u

SAMPLE ID	AL-SG-029XP-09B	AL-SG-029XP-09C	AL-SG-029XP-10A	AL-SG-029XP-10B	AL-SG-029XP-10C	AL-SG-029XP-11A
Date of Analysis	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94	4-24-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0537u	0.0537u	0.0537u	0.0537u	0.0537u	0.0696
Lead (K)	0.694u	0.694u	0.694u	0.694u	0.694u	[0.538]

SAMPLE ID	AL-SG-029XP-11B	AL-SG-029XP-11C	AL-SG-030XP-01A	AL-SG-030XP-01B	AL-SG-030XP-01C	AL-SG-030XP-02A
Date of Analysis	4-24-94	4-24-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1208	0.1201	0.128u	0.128u	0.128u	0.128u
Lead (K)	0.7674	[0.568]	1.71u	1.71u	1.71u	1.71u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-030XP-02B	AL-SG-030XP-02C	AL-SG-030XP-03A	AL-SG-030XP-03B	AL-SG-030XP-03C	AL-SG-030XP-04A
Date of Analysis	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.128u	0.128u	0.128u	0.128u
Lead (K)	1.71u	1.71u	1.71u	1.71u	1.71u	1.71u

SAMPLE ID	AL-SG-030XP-04B	AL-SG-030XP-04C	AL-SG-030XP-05A	AL-SG-030XP-05B	AL-SG-030XP-05C	AL-SG-030XP-06A
Date of Analysis	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94	4-27-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.128u	0.128u	0.128u	0.128u
Lead (K)	1.71u	1.71u	1.71u	1.71u	1.71u	1.71u

SAMPLE ID	AL-SG-030XP-06B	AL-SG-030XP-06C	AL-SG-031XP-01A	AL-SG-031XP-01B	AL-SG-031XP-01C	AL-SG-031XP-02A
Date of Analysis	4-27-94	4-27-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.128u	0.128u	0.0138u	0.0138u	0.0138u	0.0138u
Lead (K)	1.71u	1.71u	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-031XP-02B	AL-SG-031XP-02C	AL-SG-031XP-03A	AL-SG-031XP-03B	AL-SG-031XP-03C	AL-SG-031XP-04A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.1660	0.1510	0.1380	0.3229
Lead (K)	0.988u	0.988u	[0.642]	[0.145]	[0.341]	1.0477

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-031XP-04B	AL-SG-031XP-04C	AL-SG-031XP-05A	AL-SG-031XP-05B	AL-SG-031XP-05C	AL-SG-031XP-06A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.3910	0.3165	0.1426	0.1495	0.1858	0.1938
Lead (K)	[0.270]	[0.959]	[0.727]	[0.103]	[0.891]	[0.744]

SAMPLE ID	AL-SG-031XP-06B	AL-SG-031XP-06C	AL-SG-031XP-07A	AL-SG-031XP-07B	AL-SG-031XP-07C	AL-SG-031XP-08A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.2181	0.2158	0.0138u	0.0263	0.0138u	0.0138u
Lead (K)	[0.435]	[0.377]	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-031XP-08B	AL-SG-031XP-08C	AL-SG-031XP-09A	AL-SG-031XP-09B	AL-SG-031XP-09C	AL-SG-031XP-10A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u
Lead (K)	0.988u	0.988u	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-031XP-10B	AL-SG-031XP-10C	AL-SG-031XP-11A	AL-SG-031XP-11B	AL-SG-031XP-11C	AL-SG-032XP-01A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0150	0.0138u	0.0138u	0.0138u	0.0138u	0.0966u
Lead (K)	0.988u	0.988u	0.988u	0.988u	0.988u	1.28u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-032XP-01B	AL-SG-032XP-01C	AL-SG-032XP-02A	AL-SG-032XP-02B	AL-SG-032XP-02C	AL-SG-032XP-03A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u
Lead (K)	1.28u	1.28u	1.28u	1.28u	1.28u	1.28u

SAMPLE ID	AL-SG-032XP-03B	AL-SG-032XP-03C	AL-SG-032XP-04A	AL-SG-032XP-04B	AL-SG-032XP-04C	AL-SG-032XP-05A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u
Lead (K)	1.28u	1.28u	1.28u	1.28u	1.28u	1.28u

SAMPLE ID	AL-SG-032XP-05B	AL-SG-032XP-05C	AL-SG-032XP-06A	AL-SG-032XP-06B	AL-SG-032XP-06C	AL-SG-032XP-07A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.1945
Lead (K)	1.28u	1.28u	[0.637]	[0.789]	[0.123]	[0.762]

SAMPLE ID	AL-SG-032XP-07B	AL-SG-032XP-07C	AL-SG-032XP-08A	AL-SG-032XP-08B	AL-SG-032XP-08C	AL-SG-032XP-09A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.2252	0.2378	0.0966u	0.0966u	0.0966u	0.0966u
Lead (K)	[1.08]	[0.365]	1.28u	1.28u	1.28u	1.28u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-032XP-09B	AL-SG-032XP-09C	AL-SG-032XP-10A	AL-SG-032XP-10B	AL-SG-032XP-10C	AL-SG-032XP-11A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0966u	0.0966u	0.0966u	0.1340
Lead (K)	1.28u	1.28u	1.28u	1.28u	1.28u	[0.555]

SAMPLE ID	AL-SG-032XP-11B	AL-SG-032XP-11C	AL-SG-032XP-12A	AL-SG-032XP-12B	AL-SG-032XP-12A	AL-SG-032XP-13A
Date of Analysis	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94	4-25-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1355	0.1213	0.2163	0.2809	0.2906	0.0966u
Lead (K)	[0.556]	1.28u	1.2838	[0.529]	[0.680]	1.28u

SAMPLE ID	AL-SG-032XP-13B	AL-SG-032XP-13C	AL-SG-033XP-01A	AL-SG-033XP-01B	AL-SG-033XP-01C	AL-SG-033XP-02A
Date of Analysis	4-25-94	4-25-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0966u	0.0966u	0.0166	0.0148	0.0199	0.0138u
Lead (K)	1.28u	1.28u	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-033XP-02B	AL-SG-033XP-02C	AL-SG-033XP-03A	AL-SG-033XP-03B	AL-SG-033XP-03C	AL-SG-033XP-04A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u	0.0579
Lead (K)	0.988u	0.988u	[0.176]	[0.284]	[0.216]	[0.320]

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-033XP-04B	AL-SG-033XP-04C	AL-SG-033XP-05A	AL-SG-033XP-05B	AL-SG-033XP-05C	AL-SG-033XP-06A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0639	0.0778	0.0138u	0.0138u	0.0138u	0.0950
Lead (K)	[0.886]	[0.462]	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-033XP-06B	AL-SG-033XP-06C	AL-SG-033XP-07A	AL-SG-033XP-07B	AL-SG-033XP-07C	AL-SG-033XP-08A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1265	0.0849	0.0281	0.0194	0.0515	0.0138u
Lead (K)	[0.911]	[0.744]	0.988u	[0.381]	[0.277]	0.988u

SAMPLE ID	AL-SG-033XP-08B	AL-SG-033XP-08C	AL-SG-033XP-09A	AL-SG-033XP-09B	AL-SG-033XP-09C	AL-SG-033XP-10A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u
Lead (K)	0.988u	0.988u	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-033XP-10B	AL-SG-033XP-10C	AL-SG-034XP-01A	AL-SG-034XP-01B	AL-SG-034XP-01C	AL-SG-034XP-02A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u
Lead (K)	0.988u	0.988u	0.988u	0.988u	0.988u	0.988u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-034XP-02B	AL-SG-034XP-02C	AL-SG-034XP-03A	AL-SG-034XP-03B	AL-SG-034XP-03C	AL-SG-034XP-04A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.0175	0.0149	0.0138u	0.0138u
Lead (K)	0.988u	0.988u	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-034XP-04B	AL-SG-034XP-04C	AL-SG-034XP-05A	AL-SG-034XP-05B	AL-SG-034XP-05C	AL-SG-034XP-06A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.0138u	0.0138u	0.0138u	0.1911
Lead (K)	0.988u	0.988u	0.988u	0.988u	0.988u	[0.595]

SAMPLE ID	AL-SG-034XP-06B	AL-SG-034XP-06C	AL-SG-034XP-07A	AL-SG-034XP-07B	AL-SG-034XP-07C	AL-SG-034XP-08A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1935	0.1550	0.2132	0.2527	0.1912	0.0138u
Lead (K)	[0.489]	[0.472]	[0,513]	[0.477]	[0.762]	0.988u

SAMPLE ID	AL-SG-034XP-08B	AL-SG-034XP-08C	AL-SG-034XP-09A	AL-SG-034XP-09B	AL-SG-034XP-09C	AL-SG-034XP-10A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.0138u	0.0138u	0.0970	0.1011	0.1466	0.1211
Lead (K)	0.988u	0.988u	[0.711]	[0.445]	[0.905]	[0.681]

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

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TABLE Q-8 (cont.)
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LA
XRF FIELD SCREENING - PAINT IN STUDY GROUP RESIDENCES
ZT2061 ELA0116SDI

SAMPLE ID	AL-SG-034XP-10B	AL-SG-034XP-10C	AL-SG-034XP-11A	AL-SG-034XP-11B	AL-SG-034XP-11C	AL-SG-034XP-12A
Date of Analysis	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94	4-28-94
	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2	mg/cm2
ANALYTE						
Lead (L)	0.1400	0.1670	0.0138u	0.0138u	0.0138u	0.0138u
Lead (K)	[0.509]	1.0311	0.988u	0.988u	0.988u	0.988u

SAMPLE ID	AL-SG-034XP-12B	AL-SG-034XP-12C
Date of Analysis	4-28-94	4-28-94
	mg/cm2	mg/cm2
ANALYTE		
Lead (L)	0.0138u	0.0138u
Lead (K)	0.988u	0.988u

u - Analyte is undetected. Reported value is the instrument detection limit.
[] - Reported value is below the instrument detection limit.
L - Lead L-alpha line.
K - Lead K-alpha line.

001160.0502

APPENDIX R

AIR INVESTIGATION FIELD DATA

TABLE R-1

LOUISIANA AMBIENT AIR STANDARDS
REMEDIAL REMOVAL INTEGRATED INVESTIGATION
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Compounds	Chemical Abstract Services Number	Class	Ambient Air Standard	
			$\mu g/m^3$ * (8 hour avg)	$\mu g/m^{3**}$ (annual avg)
Acetaldehyde	75-07-0	II	4,290.00	
Acetonitrile	75-05-08	II	940.00	
Acrolein	107-02-8	II	5.40	
Acrylamide	79-06-1	II		.08
Acrylic Acid	79-10-7	III	140.00	
Acrylonitrile	107-13-1	I		1.47
Allyl Chloride	107-05-1	II	71.40	
Ammonia (11)	7664-41-7	III	640.00	
Aniline	62-53-3	II	181.00	
Antimony and Compounds (1)	7440-36-0	II	11.90	
Arsenic and Compounds (1)	7440-38-2	I		0.02
Asbestos (Friable)	1332-21-4	I		+
Barium and Compounds (1)	7440-39-3	II	11.90	
Benzene	71-43-2	I		12.00
Beryllium	7440-4-7	I		0.04
Biphenyl	92-52-4	II	31.00	
Bis (2-Chloroethyl) Ether	111-44-4	I		0.30
1,3 Butadiene	106-99-0	II		0.92
n-Butyl Alcohol	71-36-3	III	3,620.00	
Cadmium and Compounds (1)	7440-43-9	I		0.06
Carbon Disulfide	75-15-0	II	86.00	
Carbon Tetrachloride	5602305	II		6.67

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TABLE R-1

LOUISIANA AMBIENT AIR STANDARDS
REMEDIAL REMOVAL INTEGRATED INVESTIGATION
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Compounds	Chemical Abstract Services Number	Class	Ambient Air Standard	
			$\mu g/m^3$ * (8 hour avg)	$\mu g/m^{3**}$ (annual avg)
Carbonyl Sulfide	463-58-1	III	24.30	
Chlorinated Dibenzo-p-Dioxins (2)	3268-87-9	II		0.003
Chlorinated Dibenzo Furans (3)	51207-31-9	II		0.003
Chlorine	7782-50-5	III	35.7	
Chlorine Dioxide	10049-04-4	II	6.67	
Chlorobenzene	108-90-7	II	1,100.0	
Chloroethane	75-00-3	II	62,900.00	
Chloroform	67-66-3	II		4.30
Chloromethane	74-87-3	II		55.56
Chloroprene	126-99-8	II	857.00	
Chromium VI and Compounds (1)	7440-47-3	I		0.01
Copper and Compounds (1)	7440-50-8	II	23.80	
Cresol (4)	1319-73-3	III	276.00	
Cumene	98-82-8	III	5,860.00	
Diaminotoluene	25376-45-8	II	181.00	
1,2-Dibromoethane	106-93-4	I		0.45
Dibutyl Phthalate	84-74-2	II	119.00	
1,4-Dichlorobenzene	106-46-7	II	10,700.00	
1,2-Dichloroethane	107-06-2	II		3.85
Dichloromethate	75-09-2	II		212.77
1,2-Dichloropropane	78-87-5	II	8,260.00	
1,3-Dichloro-propylene	542-75-6	II	107.00	

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TABLE R-1

LOUISIANA AMBIENT AIR STANDARDS
REMEDIAL REMOVAL INTEGRATED INVESTIGATION
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Compounds	Chemical Abstract Services Number	Class	Ambient Air Standard	
			$\mu g/m^3$ * (8 hour avg)	$\mu g/m^3$** (annual avg)
2,4-Dinitrotoluene (5)	121-14-2	II	35.70	
2,6-Dinitrotoluene (5)	606-20-2	II	35.70	
1,4 Dioxane	123-91-1	II	2,140.00	
Epichlorohydrin	106-89-8	I		83.00
Ethyl Acrylate	140-88-5	II	476.00	
Ethyl Benzene	100-41-4	II	10,300.00	
Ethylene Glycol	107-21-1	III	3,020.00	
Ethylene Oxide	75-21-8	I		1.00
Formaldehyde	50-00-0	I		7.69
Glycol Ethers (6)	109-86-4	II	571.00	
Hexachloro-1,3-Butadiene	87-68-3	II		4.55
Hexachlorobenzene	118-74-1	II		0.2
Hexachloroethane	67-72-1	II		25.00
n-Hexane	110-54-3	III	4,190.00	
Hydrazine	302-01-2	II		0.02
Hydrochloric Acid	7647-01-0	III	180.00	
Hydrogen Cyanide	74-90-8	III	260.00	
Hydrogen Fluoride	7664-39-3	III	61.90	
Hydrogen Sulfide	7783-06-4	III	330.00	
Maelic Anhydride	108-31-6	III	23.80	
Manganese and Compounds (1)	7439-96-5	II	27.60	
Mercury and Compounds (1)	7439-97-6	II	1.19	

TABLE R-1

LOUISIANA AMBIENT AIR STANDARDS
REMEDIAL REMOVAL INTEGRATED INVESTIGATION
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Compounds	Chemical Abstract Services Number	Class	Ambient Air Standard	
			$\mu g/m^3$ * (8 hour avg)	$\mu g/m^{3**}$ (annual avg)
Methanol	67-56-1	III	6,240.00	
Methyl Ethyl Ketone	78-93-3	III	14,000.00	
Methyl Isobutyl Ketone	108-10-1	III	4,880.00	
Methylmeth-Acrylate	80-62-6	III	9,760.00	
Naphthalene and Methylnaphthalenes (12)	91-20-3	II	1,190.00	
Nickel and Compounds (1)	7440-02-0	I		0.21
Nickel (Refinery Dust) (1)	7440-02-0	I		0.42
Nitric Acid	1697-37-2	III	120.00	
Nitrobenzene	98-95-3	II	119.00	
2-Nitropropane	79-46-9	II		20.00
Phenol	108-95-2	II	452.00	
Phosgene	75-44-5	III	9.50	
Phthalic Anhydride	85-44-9	III	145.00	
Polynuclear Aromatic Hydrocarbons (7)	206-44-0	II		0.06
Propionaldehyde	123-38-6	III	4,290.00	
Propylene Oxide	75-56-9	I		27.00
Pyridine	110-86-1	III	381.00	
Selenium and Compounds (1)	7782-49-2	II	4.76	
Styrene	100-42-5	II	5,070.00	
Sulfuric Acid	7664-93-9	III	23.80	
1,1,2,2 Tetra-Chloroethane	79-34-5	II		1.70
Tetrachloroethylene	127-18-4	II		105.26

TABLE R-1

LOUISIANA AMBIENT AIR STANDARDS
REMEDIAL REMOVAL INTEGRATED INVESTIGATION
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Compounds	Chemical Abstract Services Number	Class	Ambient Air Standard	
			$\mu g/m^3$ * (8 hour avg)	$\mu g/m^3$** (annual avg)
Toluene	108-88-3	III	8,900.00	
Toluene-2,4-Diisocyanate (8)	584-84-9	II	0.86	
Toluene-2,6-Diisocyanate (8)	91-08-7	II	0.86	
1,1,1-Trichloroethant	71-55-6	III	4,550	
1,1,2-Trichloroethane	79-00-5	II		6.25
Trichloroethylene	79-01-6	II		58.80
Vinyl Acetate	108-05-4	III	830.00	
Vinyl Chloride	75-01-4	I		1.19
Vinylidene Chloride	75-35-4	II		2.00
Xylene (Mixed Isomers) (9)	1330-20-7	II	10,300.00	
Zinc and Compounds (1)(10)	7440-66-6	II	119.00	

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Key:

* Based on one forty-second of the selected occupational exposure level, or other data determined to be superior by the administrative authority.

** Based on unit factors and a residual risk of one in ten thousand, or other data determined to be superior by the administrative authority.

\+ Refer to standards pursuant to Louisiana Code (LAC) 33:III.5151.

[1] Includes any unique chemical substance that contains the listed metal as part of that chemical's infrastructure. Concentrations based on ug(x)/m^3, where x is the elemental form of the metal.

[2] Includes only 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), and octachlorodi-benzo-p-dioxin (OCDD).

[3] Includes all isomers of chlorinated dibenzo-furans.

[4] Includes o-, m-, and p-cresol, and mixed isomers.

[5] Includes 2,4- and 2,6-dinitrotoluene and mixed isomers.

[6] Glycol ether refers to the following compounds: Ethylene glycol monomethyl ether (Chemical Abstract Services Number (CAS#) 109864), Ethylene glycol monomethyl ether acetate (CAS# 110496), Ethylene glycol monoethyl ether (CAS# 110805), Ethylene glycol monoethyl ether acetate (CAS# 111159), Diethylene glycol dimethyl ether (CAS# 111966), Ethylene glycol dimethyl ether (CAS# 110714).

[7] Includes organic compounds with more than one fused benzene ring and which have a boiling point greater than or equal to 100°C. Those compounds listed as Naphthalene and Methylnaphthalene are not to be included as PAHs for the purposes of this regulation.

[8] Includes toluene-2,4- and 2,6- diisocyanate and mixed isomers.

[9] Includes o-, m-, and p-xylene, and mixed isomers.

[10] Concentrations based on mg ZnO/m^3.

[11] Excludes soil of foliar application of ammonia in agricultural practices.

[12] Includes the following compounds: Naphthalene (CAS #91-20-3), Methylnaphthalene (CAS# 1321-94-4), 1-Methylnaphthalene (CAS# 90-12-0), 2-Methylnaphthalene (CAS#91-57-6).

Source: Ecology and Environment, Inc., 1994

001160.0509

TABLE R-2

MEDIAN VOC AIR CONCENTRATIONS IN STUDY GROUP RESIDENCES COMPARED TO VALUES REPORTED IN THE NATIONAL AIR TOXICS DATABASE REMEDIAL REMOVAL INTEGRATED INVESTIGATION AGRICULTURE STREET LANDFILL NEW ORLEANS, LOUISIANA

Compound	Study Group Residences Median Interior Concentrations (ppbv)	National Air Toxic Median Residential Indoor Concentrations (ppbv)	Study Group Residences Median Exterior Concentrations (ppbv)	National Air Toxic Median Urban Ambient Air Concentration (ppbv)
1,1,1-Trichloroethane	0.46	NR	0.26	0.40
1,2,4-Trimethylbenzene	0.72	NR	0.34	1.00
1,3,5-Trimethylbenzene	0.47	0.30	*	0.20
1,3-Dichlorobenzene	*	0.25	*	0.01
1,4-Dichlorobenzene	1.90	1.29	0.40	0.05
Benzene	1.50	1.77	0.94	1.81
Chloroethane	0.33	NR	-	0.10
Chloroform	0.60	NR	0.41	0.06
Chloromethane	0.39	NR	0.31	0.81
Ethylbenzene	0.69	1.00	0.30	0.62
Freon 11	1.00	NR	0.35	0.36
Freon 12	0.59	NR	0.58	0.73

001160.0510

TABLE R-2

MEDIAN VOC AIR CONCENTRATIONS IN STUDY GROUP RESIDENCES COMPARED TO VALUES REPORTED IN THE NATIONAL AIR TOXICS DATABASE REMEDIAL REMOVAL INTEGRATED INVESTIGATION AGRICULTURE STREET LANDFILL NEW ORLEANS, LOUISIANA

Compound	Study Group Residences Median Interior Concentrations (ppbv)	National Air Toxic Median Residential Indoor Concentrations (ppbv)	Study Group Residences Median Exterior Concentrations (ppbv)	National Air Toxic Median Urban Ambient Air Concentration (ppbv)
M,P-Xylene (106-42-3)	2.00	NA	0.93	NA
Methane	8.90	NA	-	NA
Methylene Chloride	0.50	NR	*	0.84
O-Xylene	0.72	NA	0.35	NA
Styrene	0.45	NA	0.32	NA
Tetrachloroethene	0.63	0.88	0.21	0.37
Toluene	6.50	NA	1.30	NA
Trichloroethene	0.77	NR	0.46	0.21

ppbv-parts per billion volume
'-' designates a Non Detect Value for that specific compound
'*' designates frequency of detection less than 5% and median value could not be calculated
NR - Median value not reported in National Air Toxic Database
NA - Compound not reported in National Air Toxic Database

Source: Ecology and Environment, Inc., 1994

RRII:	Agriculture Street Landfill
Section No.:	S.TOC
Revision No.:	1
Date:	March 1995

APPENDIX S

HUMAN HEALTH RISK ASSESSMENT

001160.0512

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LIST OF ACRONYMS

ASD	Agriculture Street Dump
ASL	Agriculture Street Landfill
CDI	Chronic Daily Intake
CLP	Contract Laboratory Program
CNS	Central Nervous System
COPC	Contaminant of Potential Concern
cm^2	Square Centimeters
days/year	Days Per Year
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ESI	Expanded Site Investigation
FI	Fraction Ingested
ft^2	Square Feet
GSD	Geometric Standard Deviation
HANO	Housing Authority of New Orleans
HEAST	Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IEUBK	Integrated Exposure Uptake Biokinetic Model
IRIS	Integrated Risk Information System
kg	Kilograms
L/day	Liters Per Day
L/m^3	Liters Per Cubic Meters
LADI	Lifetime Average Daily Intake
LOAEL	Lowest Observed Adverse Effect Level
MCL	Maximum Contaminant Level
m	Meter
m^2	Square Meters
m^3/day	Cubic Meters Per Day

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m/s	Meters Per Second
µg/L	Micrograms Per Liter
µg/dL	Micrograms Per Deciliter
mg/kg	Milligrams Per Kilogram
mg/kg-day	Milligrams Per Kilogram Per Day
mg/s	Milligrams Per Second
MF	Modifying Factor
NOAEL	No Observed Adverse Effect Level
OSWER	Office of Solid Waste and Emergency Response
PAH	Polynuclear Aromatic Hydrocarbon
PCDD	Polychlorinated dibenzo-p-dioxin
PCDF	Polychlorinated Dibenzofuran
ppb	Parts Per Billion
QA/QC	Quality Assurance/Quality Control
r^2	Correlation Coefficients
RBC	Risk-Based Concentration
RfC	Reference Concentration
RfD	Reference Dose
RME	Reasonable Maximum Exposure
RRII	Remedial and Removal Integrated Investigation
SF	Slope Factor
SGR	Study Group Residence
TEF	Toxicity Equivalency Factor
UCL	Upper Confidence Limit
UF	Uncertainty Factor
VOC	Volatile Organic Compound
XRF	X-ray Fluorescence
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-*p*-dioxin TEF equivalent concentrations (equivalents)

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GLOSSARY OF TERMS

Absorbed Dose. The amount of a substance penetrating the exchange boundaries of an organism after contact. Absorbed dose is calculated from the intake and the absorption efficiency. It usually is expressed as mass of a substance absorbed into the body per unit body weight per unit time (e.g., mg/kg-day).

Acceptable Daily Intake (ADI). An estimate similar in concept to the RfD, but derived using a less strictly defined methodology. RfDs have replaced ADIs as the Agency's preferred values for use in evaluating potential noncarcinogenic health effects resulting from chronic exposure to a chemical.

Acceptable Intake for Subchronic Exposure (AIS). An estimate similar in concept to the subchronic RfD, but derived using a less strictly defined methodology. Subchronic RfDs have replaced AISs as EPA's preferred values for use in evaluating potential noncarcinogenic health effects resulting from subchronic exposure to a chemical.

Accuracy. The degree of agreement of a measured value with the true or expected value of the quantity of concern.

Acute Exposure. Exposure to a chemical for less than 24 hours.

Acute Test. A comparative study in which organisms, that are subjected to different treatments, are observed for a short period usually not constituting a substantial portion of their life span. [NOTE: There is no specific test duration that represents a distinct boundary between acute and chronic test durations for any species. Although acute or chronic test procedures may specify standard duration(s), these durations have not been intended to define an acutechronic boundary.

Acute tests often utilize mortality as the only measure of effect; chronic tests usually include additional measures of effect such as growth or reproduction.]

Administered Dose. The mass of a substance given to an organism and in contact with an exchange boundary (e.g., gastrointestinal tract) per unit body weight per unit time (e.g., mg/kg-day).

Analyte. The chemical analyzed for in a sample.

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Analyte Speciation. The ability of an analyte to exist in, or change between, chemically different forms (e.g., valence state, complexation state) depending on ambient conditions.

Anthropogenic Background Levels. Concentrations of chemicals that are present in the environment due to human-made, non-site sources (e.g., industry, automobiles).

Applied Dose. The amount of a substance given to an organism, especially through dermal contact.

Average. The sum of a set of observations divided by the number of observations. Other measures of central tendency are median, mode, or geometric mean.

Background Sample. A sample taken from a location where chemicals present in the ambient medium are assumed due to natural sources.

Bias. A systematic error inherent in a method or caused by some artifact or idiosyncrasy of the measurement system.

Biased Sampling. A sampling plan in which the data obtained may be systematically different from the true mean. Biased sampling protocols are appropriate for certain objectives (e.g., clustering of samples to search for hot spots).

Bioaccumulation. The net accumulation of a substance by an organism as a result of uptake from all environmental sources.

Bioconcentration. The net accumulation of a substance by an aquatic organism as a result of uptake directly from aqueous solution.

Biomagnification. The increase in tissue concentration of poorly depurated materials in organisms along a series of predator-prey associations, primarily through the mechanism of dietary accumulation.

Biota. The plants and animals of the study area.

Blank. A clean sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage, or analysis.

Broad Spectrum Analysis. An analytical procedure capable of providing identification and quantitation of a wide variety of chemicals.

Calibration. The comparison of a measurement standard or instrument with another standard or instrument to report or eliminate, by adjustment, any variation (deviation) in accuracy of the item being compared. The levels of calibration standards should bracket the range of levels for which actual measurements are to be made.

Chain-of-Custody Records. Records that contain information about the sample from sample collection to final analysis. Such documentation includes labeling to prevent mix-up, container seals to detect unauthorized tampering with contents and to secure custody, and the necessary records to support potential litigation.

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Contaminants of Potential Concern. Contaminants that are potentially site-related and whose data are of sufficient quality for use in the quantitative risk assessment.

Chronic Daily Intake (CDI). Exposure expressed as mass of a substance contacted per unit body weight per unit time, averaged over a long period of time (as a Superfund program guideline, seven years to a lifetime).

Chronic Exposure. Repeated exposure to a chemical for one to three months.

Chronic Reference Dose (RfD). An estimate (with uncertainty spanning perhaps an order of magnitude or greater) of an exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. Chronic RfDs are specifically developed to be protective for long-term exposure to a compound (as a Superfund program guideline, seven years to lifetime).

Chronic Test. A comparative study in which organisms, that are subjected to different treatments, are observed for a long period or substantial portion of their life span. [NOTE: There is no specific test duration that represents a distinct boundary between acute and chronic test durations for any species. Although acute or chronic test procedures may specify standard duration(s), these durations have not been intended to define an acute:chronic boundary. Acute tests often utilize mortality as the only measure of effect; chronic tests usually include additional measures of effect such as growth or reproduction.

Classical Model. A statistical description of experimental data that assumes normality and independence.

Common Laboratory Contaminants. Certain organic chemicals (considered by EPA to be acetone, 2-butanone, methylene chloride, toluene, and the phthalate esters) that are commonly used in the laboratory and may be introduced into a sample from laboratory cross-contamination, not from the site.

Confidence. Statistically, a measure of the probability of taking action when action is required or that an observed value is correct. A confidence limit is a value above or below a measured parameter that is likely to be observed at a specified level of confidence.

Contact Rate. Amount of medium (e.g., groundwater, soil) contacted per unit time or event (e.g., liters of water ingested per day).

Contract Laboratory Program (CLP). Analytical program developed for Superfund waste site samples to fill the need for legally defensible analytical results supported by a high level of quality assurance and documentation.

Contract-required Quantitation Limit (CRQL). Chemical-specific levels that a CLP laboratory must be able to routinely and reliably detect and quantitate in specified sample matrices. May or may not be equal to the reported quantitation limit of a given chemical in a given sample.

Control Sediment. A sediment that is essentially free of contaminants and is used routinely to assess the acceptability of a test.

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Data Assessment. The determination of the quantity and quality of data and their useability for risk assessment.

Data Review. The evaluation process that determines the quality of reported analytical results. It involves examination of raw data (e.g., instrument output) and quality control and method parameters by a professional with knowledge of the tests performed.

Data Quality Objectives (DQOs). Qualitative and quantitative statements to ensure that data of known and documented quality are obtained during an RI/FS to support an Agency decision.

Data Useability. The ability or appropriateness of data to meet their intended use.

Data Validation. An evaluation process that examines adherence to performance-based acceptance criteria.

Depuration. Loss of a substance from an organism as a result of any active or passive process.

Detection Limit (DL). The lowest amount that can be distinguished from the normal "noise" of an analytical instrument or method.

Developmental Reference Dose (RfD_{dt}). An estimate (with uncertainty spanning perhaps an order of magnitude or greater) of an exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of developmental effects. Developmental RfDs are used to evaluate the effects of a single exposure event.

Dietary Accumulation. The net accumulation of a substance by an organism as a result of ingestion in the diet.

Dilution. Adding solvent to a sample having an analyte concentration higher than the standard calibration curve, to bring the analyte concentration into a quantifiably measurable range.

Dissolved Metals. Metals present in solution rather than sorbed on suspended particles.

Domain. A mappable subset of the total area containing the populations, after which distinct statistical properties can be described.

Dose-response Evaluation. The process of quantitatively evaluating toxicity information and characterizing the relationship between the dose of a contaminant administered or received and the incidence of adverse health effects in the exposed population. From the quantitative dose-response relationship, toxicity values are derived that are used in the risk characterization step to estimate the likelihood of adverse effects occurring in humans at different exposure levels.

Duplicate. A second sample taken from the same source at the same time and analyzed under identical conditions to assist in the evaluation of sample variance.

EC50. A statistically or graphically estimated concentration that is expected to cause one or more specified effects in 50% of a group of organisms under specified conditions.

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ED50. A statistically or graphically estimated dose that is expected to cause one or more specified effects in 50% of a group of organisms under specified conditions.

Exposure. Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) and available for absorption.

Exposure Area. The area of a site over which a receptor is likely to contact a chemical of potential concern.

Exposure Assessment. The determination or estimation (qualitative or quantitative) of the magnitude, frequency, duration, and route of exposure.

Exposure Event. An incident of contact with a chemical or physical agent. An exposure event can be defined by time (e.g., day, hour) or by the incident (e.g., eating a single meal of contaminated fish).

Exposure Pathway. The course a chemical or physical agent takes from a source to an exposed organism. An exposure pathway describes a unique mechanism by which an individual or population is exposed to chemicals or physical agent at or originating from a site. Each exposure pathway includes a source or release from a source, an exposure point, and an exposure route. If the exposure point differs from the source, a transport/exposure medium (e.g., air) or media (in cases of intermedia transfer) also in included.

Exposure Point. A location of potential contact between an organism and a chemical or physical agent.

Exposure Route. The way a chemical or physical agent comes in contact with an organism (i.e., by ingestion, inhalation, dermal contact).

Extraction. The process of releasing compounds form a sample matrix prior to analysis.

False Negative (type II or beta error). A statement that a condition does not exist when it actually does.

False Positive (type I or alpha error). A statement that a condition does exist when it actually does not.

Fate, Environmental. The form and location of a material resulting from transport and transformation.

Field Analyses. Analyses performed in the field using sophisticated portable instruments or instruments set up in a mobile laboratory on site. Results are available in real time or in several hours and may be quantitative or qualitative.

Field Portable. An instrument that is sufficiently rugged and not of excessive weight that can be carried and used by an individual in the field.

Field Sampling Plan (FSP). Provides guidance for all field work by defining in detail the sampling and data gathering methods to be used on a project.

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Field Screening. Analyses performed in the field using portable instruments. The results are available in real time but are often not compound-specific or quantitative.

Final Remediation Levels. Chemical-specific cleanup levels that are documented in the Record of Decision (ROD). They may differ from preliminary remediation goals (PRGs) because of modifications resulting from consideration of various uncertainties, technical, and exposure factors, as well as all nine selection-of-remedy criteria outlined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

Fixed Laboratory Analyses. Analyses performed in an off-site analytical laboratory.

Frequency of Occurrence. The ratio of occurrence of a chemical existing at a site compared to occurrence at all sites or compared to the frequency at which the chemical was tested for.

Geographical Information System (GIS). A computerized database designed to overlay multiple information elements such as maps, annotations, drawings, digital photos, and estimated concentrations.

Geostatistical Model. A statistical or mathematical description of experimental data with special attention to spatial covariance or temporal variation.

Geostatistics. A theory of statistics that recognizes observed concentrations as dependent on one another and governed by physical processes. Geostatistical methods consider the location of data and the size of the site for calculations.

Hazard. The adverse effect(s) that may result from exposure(s).

Hazard Identification. The process of determining whether exposure to an agent can cause an increase in the incidence of a particular adverse health effect (e.g., cancer, birth defect) and whether the adverse health effect is likely to occur in humans.

Hazard Index (HI). The sum of more than one hazard quotient for multiple substances and/or multiple exposure pathways. The HI is calculated separately for chronic, subchronic, and shorter-duration exposures.

Hazard Quotient. The ratio of a single substance exposure level over a specified time period (e.g., subchronic) to a reference dose for that substance derived from a similar exposure period.

Heterogeneous Distribution. Sample property that is unevenly distributed in the population.

Historical Data. Data collected before the remedial investigation.

Holding Time. The length of time from the date of sampling to the date of analysis. CLP designates the holding time as the date from laboratory receipt of sample until date of analysis.

Homogeneous Distribution. A sample property that is evenly distributed over the population.

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Hot Spot. Location of a substantially higher concentration of a chemical of concern than in surrounding areas of a site.

Hydrocarbon. An organic compound composed of carbon and hydrogen.

IC50. A statistically or graphically estimated concentration of test material that, under specified conditions, is expected to cause a 50% inhibition of a biological process (such as growth or reproduction) for which the data are not dichotomous.

Identification. Confirmation of the presence of a specific compound or analyte in a sample.

Instrument Detection Limit (IDL). The lowest amount of a substance that can be detected by an instrument without correction for the effects of sample matrix, handling, and preparation.

Intake. A measure of exposure expressed as the mass of a substance in contact with the exchange boundary per unit body weight and unit time.

Integrated Risk Information Systems (IRIS). An EPA database containing verified RFDs, RfCs, slope factors, up-to-date health risks, and EPA regulatory information for numerous chemicals. IRIS is EPA's preferred source for toxicity information for Superfund.

Internal Standard. A compound added to organic samples and blanks at a known concentration prior to analysis. It is used as the basis for quantitation of target compounds.

Judgmental/Purposive Sampling. The process of locating sampling points based on the investigator's best judgment from historical data of where the sample should be taken.

Kriging. A procedure utilizing a spatial covariance function and known values at sampling locations to estimate unknown values at unsampled locations. For each estimate, an error of estimate is generated.

LC50. A statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

LD50. A statistically or graphically estimated dose that is expected to be lethal to 50% of a group of organisms under specified conditions.

Life-cycle Test. a comparative study in which organisms, that are subjected to different treatments, are observed at least from a life stage in one generation to the same life stage in the next generation.

Lifetime Average Daily Intake. Exposure expressed as mass of a substance contacted per unit body weight per unit time, averaged over a lifetime.

Limit of Detection (LOD). The concentration of a chemical that has a 99% probability of producing an analytical result above background "noise" using a specific method.

Limit of Quantitation (LOQ). The concentration of a chemical that has a 99% probability of producing an analytical result above the LOD. Results below LOQ are not quantitative.

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Linearity. The agreement between an actual instrument reading and the reading predicted by a straight line drawn between calibration points that bracket the reading.

Mass Spectrum. A characteristic pattern of ion fragments of different masses resulting from analysis that can be compared with a mass spectral library for analyte identification.

Matrix/Medium. The predominant material comprising the sample to be analyzed (e.g., drinking water, sludge, air).

Measurement Error. The difference between the true sample value and the observed measured value.

Measurement Variability. The difference between an observed measurement and the unknown true value of the property being measured.

Media Variability. Variability attributed to matrix effects.

Method Blank Performance. A measure that defines the level of laboratory background and reagent contamination. It is determined by analyzing a method blank consisting of all reagents, internal standards, and surrogate standards that are carried through the entire analytical procedure.

Method Detection Limit (MDL). The detection limit that takes into account the reagents, sample matrix, and preparation steps applied to a sample in specific analytical methods.

Minimum Detectable Relative Difference. Percent difference between two concentration levels that can be detected in analyses.

Modeling. A mathematical description of an experimental data set.

Natural Variation. Variation in values or properties of a parameter that are primarily determined by natural forces or conditions (e.g., variation in background levels of a chemical of potential concern in soils at a site).

Naturally Occurring Background Levels. Ambient concentrations of chemicals that are present in the environment and have not been influenced by humans (e.g., aluminum, manganese).

No-Observed-Adverse-Effect-Level (NOAEL). In dose-response experiments, an exposure level at which there are no statistically or biologically significant increases in the frequency or severity of adverse effects between the exposed population and its appropriate control; some effects may be produced at this level, but they are not considered to be adverse, nor precursors to specific adverse effects. In an experiment with more than one NOAEL, the regulatory focus is primarily on the highest one, leading to the common usage of the term NOAEL to mean the **highest** exposure level without adverse effect.

No-Observed-Effect-Level (NOEL). In dose-response experiments, an exposure level at which there are no statistically or biologically significant increases in the frequency or severity of **any** effect between the exposed population and its appropriate control.

Nondetects (NDs). Chemicals that are not detected in a particular sample above a certain limit, usually the quantitation limit for the chemical in that sample. Nondetects may be indicated by a "U" data qualifier.

Normal Distribution. A probability density function that approximates the distribution of many random variables and has the form generally called the "bell-shaped curve."

Null Hypothesis. For risk assessment, statistical hypothesis that states on-site chemical concentrations are not higher than background.

Particulate. Solid material suspended in a fluid medium (air or water).

Performance Evaluation Sample. A sample of known composition provided for laboratory analysis to monitor laboratory and method performance.

Performance Objectives. Statements of the type and content of deliverables and results that are necessary to assess the useability of data for risk assessment. For example, documentation (chain-of-custody records) must be available to relate all sample results to geographic locations.

Population Variability. The variation in true pollution levels from one population unit to the next. Some factors that cause this variation are distance, direction, and elevation.

Positive Data. Analytical results for which measurable concentrations (i.e., above a quantitation limit) are reported. May have data qualifiers attached (except a U, which indicates a nondetect).

Power. A parameter used in statistics that measures the probability that the result from a specified sampling or analytical process correctly indicates that no further action is required.

Practical Quantitation Limit (PQL). The lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Precision. A measure of the agreement among individual measurements of the same property, under prescribed similar conditions.

Preliminary Remediation Goals (PRGs). Initial clean-up goals that 1) are protective of human health and the environment and 2) comply with ARARs. They are developed early in the process based on readily available information and are modified to reflect results of the baseline risk assessment. They also are used during analysis of remedial alternatives in the remedial investigation/feasibility study (RI/FS).

Preservation. Treatment of a sample to maintain representative sample properties.

Qualifier. A code appended to an analytical result that indicates possible qualitative or quantitative uncertainty in the result.

Qualitative. An analysis that identifies an analyte in a sample without numerical certainty.

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Quality Assurance Project Plan (QAPjP). An orderly assembly of detailed and specific procedures which delineates how data of known and accepted quality is produced for a specific project.

Quantitation Limit (QL). The lowest level at which a chemical can be accurately and reproducibly quantitated. Usually equal to the instrument detection limit multiplied by a factor of three to five, but varies for different chemicals and different samples.

Quantitative. An analysis that gives a numerical level of certainty to the concentration of an analyte in a sample.

Random Sampling. The process of locating sample points randomly within a sampling area.

Range of Linearity. The concentration range over which the analytical curve remains linear. The limit within which response is linearly related to concentration.

Reasonable Maximum Exposure (RME). The maximum exposure that could reasonably be expected to occur for a given exposure pathway at a site. The RME is intended to account for both variability in exposure parameters and uncertainty in the chemical concentration.

Receptor. An individual organism or species, or a segment of the population of the organism or species, that is exposed to a chemical.

Recovery. A determination of the accuracy of the analytical procedure made by comparing measured values for a spiked sample against the known spike values.

Reference Concentration (RfC). An estimate, with uncertainty spanning an order of magnitude, of continuous exposure to the human population (including sensitive subgroups) through inhalation that is likely to be without appreciable risk of deleterious effect during a lifetime.

Reference Dose (RfD). The EPA's preferred toxicity value for evaluating noncarcinogenic effects resulting from exposures at Superfund sites. See specific entries for chronic RfD, subchronic RfD, and development RfD. The acronym RfD, when used without other modifiers, either refers generically to all types of RfDs or specifically to chronic RfDs; it never refers specifically to subchronic or developmental RfDs.

Relative Percent Difference (RPD). A measure of precision which is based on the mean of two values from related analyses and is reported as an absolute value.

Relative Response Factor (RRF). A measure of the relative mass spectral response of an analyte compared to its internal standard. RRFs are determined by the analysis of standards and are used in the calculation of concentration of analytes in samples.

Remedial Investigation (RI). A process for collecting data to characterize site and waste and for conducting treatability testing as necessary to evaluate the performance and cost of the treatment technologies and support the design of selected remedies.

Representativeness. The degree to which the data collected accurately reflect the actual concentration or distribution.

Retention Time. The length of time that a compound is retained on an analytical column (common in GC, HPLC, and IC).

Risk. The probability or likelihood an adverse effect will occur.

Risk-based PRGs. Concentration levels set at scoping for individual chemicals that correspond to a specific cancer risk level of 10^{-6} or an HQ/HI of 1. They are generally selected when ARARs are not available.

Risk Characterization. The process of integrating the results of the exposure and toxicity assessments (i.e., comparing estimates of intake with appropriate toxicological values to determine the likelihood of adverse effects in comparing estimates of intake with appropriate toxicological values to determine the likelihood of adverse effects in potentially exposed populations).

Routine Analytical Services (RAS). The set of CLP analytical protocols that are used to analyze most Superfund site samples. These protocols are provided in the EPA Statements of Work for the CLP (*SOW for Inorganics*, *SOW for Organics*) and must be followed by every CLP laboratory.

Routine Method. A method issued by an organization with appropriate responsibility. A routine method has been validated and published and contains information on minimum performance characteristics.

Sample Integrity. The maintenance of the sample in the same condition as when sampled.

Sample Quantitation Limit (SOL). The detection limit that accounts for sample characteristics, sample preparation and analytical adjustments, such as dilution.

Sampling and Analysis Plan (SAP). A document consisting of a Quality Assurance Project Plan, and the Field Sampling Plan, which provides guidance for all field sampling and analytical activities that will be performed.

Sampling Variability. The variability attributed to various sampling schemes, such as judgmental sampling and systematic sampling.

Sensitivity. The capability of methodology or instrumentation to discriminate between measurement responses for quantitative differences in a parameter of interest.

Simple Random Sampling. A sampling scheme where positions, times, or intervals are based on a randomized selection.

Slope Factor. A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The slope factor is used to estimate an upper-bound probability of an individual developing cancer as a result of a lifetime of exposure to a particular level of a potential carcinogen.

Solvent. A liquid used to dissolve and separate analytes from the matrix of origin.

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Spatial Variation. The manner in which contaminants vary within a defined area. The magnitude of difference in contaminant concentrations in samples separated by a known distance is a measure of spatial variability.

Special Analytical Services (SAS). Nonstandardized analyses conducted under the CLP to meet user requirements that cannot be met using RAS, such as shorter analytical turnaround time, lower detection limits, and analysis of nonstandard matrices or non-TCL compounds.

Spike. A known amount of a chemical added to a sample for the purpose of determining efficiency of recovery; a type of quality control sample.

Spiked Sediment. A sediment to which a material has been added for experimental purposes.

Split. A single sample divided for the same measurement by two processes for the purpose of monitoring precision, accuracy, or comparability of two analyses.

Standard Deviation. The most common measure of the dispersion of observed values or results expressed as the magnitude of the square root of the variance.

Standard Operating Procedures (SOPs). A written document which details an operation, analysis, or action whose mechanisms are thoroughly prescribed.

Statement of Work (SOW) for the CLP. A document that specifies the instrumentation, sample handling procedures, analytical parameters and procedures, required quantitation limits, quality control requirements, and report format to be used by CLP laboratories. The SOW also contains the TAL and TCL.

Stratified Random Sampling. A sampling scheme where the target population is divided into a certain number of non-overlapping parts for the purpose of achieving a better estimate of the population parameter.

Stratified Systematic Sampling. A sampling scheme where a consistent pattern is apportioned to various subareas or domains.

Stratify. To divide a physical volume or area into discrete units (strata) which are assumed to have different characteristics; a numeric procedure to subdivide a set or sets of data.

Subchronic Daily Intake (SDI). Exposure expressed as mass of a substance contacted per unit body weight per unit time, averaged over a portion of a lifetime (as a Superfund program guideline, two weeks to seven years).

Subchronic Exposure. Repeated exposure to a chemical for one to three months.

Subchronic Reference Dose (RfD_s). An estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a portion of a lifetime (as a Superfund program guideline, two weeks to seven years).

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Surrogate Standard. A standard of known concentration added to environmental samples for quality control purposes. A surrogate standard is not likely to be found in an environmental sample, but has similar analytical properties to one or more analytes of interest.

Surrogate Technique. The use of surrogate analytes to assess the effectiveness of an analytical process (i.e., the ability to recover analytes from a complex environmental matrix).

Systematic Random (Grid) Sampling. A random sampling plan utilizing points predefined by a geometric pattern.

Target Analyte List (TAL). Developed by EPA for Superfund site sample analyses. The TAL is a list of 23 metals plus total cyanide routinely analyzed using RAS.

Target Compound/Analyte. The compound/analyte of interest in a specific method. The term also has been used in the Federal Register to denote compounds/analytes of regulatory significance.

Target Compound List (TCL). Developed by EPA for Superfund site sample analyses. The TCL is a list of analytes (34 volatile organic chemicals, 65 semivolatile organic chemicals, 19 pesticides, seven polychlorinated biphenyls, 23 metals, and total cyanide) routinely analyzed using RAS.

Target Risk. A value that is combined with exposure and toxicity information to calculate a risk-based concentration (e.g., PRG). For carcinogenic effects, the target risk is a cancer risk of 10^{-6}. For noncarcinogenic effects, the target risk is a hazard quotient of 1.

Temporal Variation. Variation observed in chemical concentrations that is dependent on time.

Tentatively Identified Compound (TIC). Organic compounds detected in a sample that are not target compounds, internal standards, or surrogates.

Toxicity. The property of a material, or combination of materials, to adversely affect organisms.

Toxicity Assessment. The toxicity assessment considers the following: 1) the types of adverse health effects associated with chemical exposures; 2) the relationship between magnitude of exposure and adverse effects; and 3) related uncertainties such as the weight of evidence of a particular chemical's carcinogenicity in humans.

Toxicity Value. A numerical expression of a substance's dose-response relationship that is used in risk assessments. The most common toxicity values used in Superfund program risk assessments are reference doses (for noncarcinogenic effects) and slope factors (for carcinogenic effects).

Toxicological Threshold. The concentration at which a compound exhibits toxic effects.

Turnaround Time. The time from laboratory receipt of samples to receipt of a data package by the client.

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Uncertainty. The variability in a process that may consist of contributions from sampling, analysis, review, and random error.

95% Upper Confidence Limit (UCL). A value that, when calculated repeatedly for different, randomly drawn subsets of site data, equals or exceeds the true mean 95% of the time.

Uptake. Acquisition of a substance from the environment by an organism as a result of any active or passive process.

Useful Range. That portion of the calibration curve that will produce the most accurate and precise results.

Variance. A measure of dispersion. It is the sum of the squares of the differences between the individual values and the arithmetic mean of the set, divided by one less than the number of values.

Viscosity. The physical property of a fluid that offers a continued resistance to flow.

Volatile Organics. The solid or liquid compounds that may undergo spontaneous phase change to a gaseous state at standard temperature and pressure.

Wavelength. The linear distance between successive maxima or minima of a wave form.

Weight-of-Evidence Classification. An EPA classification system for characterizing the extent to which the available data indicate that an agent is a human carcinogen. Recently, EPA has developed weight-of-evidence classification systems for some other kinds of toxic effects, such as developmental effects.

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EXECUTIVE SUMMARY

INTRODUCTION

This baseline human health risk assessment (HHRA) is a component of the Remedial Removal Integrated Investigation (RRII) and Feasibility Study (FS) for the Agriculture Street Landfill (ASL) site in New Orleans, Louisiana. The objective of the baseline HHRA is to evaluate potential adverse health effects associated with site-related contaminants in the absence of remedial action. The results of the baseline HHRA will be used in making decisions regarding the necessity and extent of remediation, in developing site-specific cleanup levels, and in selecting appropriate remedial technologies.

This baseline HHRA focuses on potential exposures to the contaminants of potential concern (COPCs) at the ASL site. These potential exposures were evaluated using exposure scenarios developed in collaboration with risk assessment personnel from the United States Environmental Protection Agency (EPA) Region 6. The exposure scenarios reflect site-specific current and future land uses at the ASL site. Health risks were evaluated for the developed area, which includes the study group residences (SGRs), the Moton Elementary School (Moton School), and the Press Park Community Center, as well as the undeveloped portion of the site.

Because lead was shown to be a significant contaminant at the ASL site in the expanded site inspection (ESI) (E & E 1993), an extensive evaluation of exposures to lead was performed using the latest version of EPA's Integrated Exposure Uptake Biokinetic (IEUBK) model. The IEUBK model requires the input of numerous multimedia data from potential

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lead sources in homes (e.g., soils, dust, and tap water). Consequently, a representative group of SGRs was randomly selected and combined with residences identified in the ESI to evaluate the current health risks posed by lead. In addition, potential future lead-associated health risks were evaluated in the undeveloped portion of the site.

For contaminants other than lead, the likelihood of adverse public health impacts associated with long-term exposure to ASL site-related contaminants was determined by estimating the potential excess lifetime cancer risks for carcinogens and by computing hazard indices (HIs) for noncarcinogens. Exposure and risk estimates were generated by using conservative reasonable maximum exposure (RME) and average (central tendency) exposure values. The average case represents exposure that is most likely to occur for the majority of the potentially exposed population and is evaluated with the RME case to provide a range of risk estimates.

A summary of the exposure scenarios and pathways evaluated and the risk results are presented in Tables S.ES-1 through S.ES-4.

CURRENT RISKS

Except for current RME residential and worker scenarios, cumulative cancer risks for potential current exposures were within the range of acceptable risks defined in federal environmental laws and regulations, i.e., 1×10^{-6} to 1×10^{-4} (see Table S.ES-1). However, the RME residential cumulative cancer risk estimate of 8×10^{-4} exceeded the upper bound of the acceptable risk range. Risk originated from the inhalation of chloroform and benzene in indoor air and ingestion of 2,3,7,8-TCDD (equivalents) and arsenic in soils. Chloroform is associated with the chlorination of drinking water, municipal sewage, auto exhaust, fluorocarbon refrigerants, and dry cleaning agents, and benzene can be found in plastics, auto exhaust, paints, and perfumes (Howard 1990; Verschueren 1983).

Under current exposure conditions, only the residential scenario yielded noncancer hazard indices (HIs) in excess of EPA's regulatory benchmark of 1 (see Table S.ES-2). The RME adult and child HIs were 2 and 5, respectively. The ingestion of homegrown produce containing diazinon, a commonly used organophosphate pesticide, contributed most to the HI; samples were analyzed from two garden samples.

EPA's regulatory standard for assessing lead risks is that a maximum of 5% of children have blood lead levels above 10 micrograms per deciliter (μg/dL). In the evaluation of lead in the SGRs, it was predicted that the 10 μg/dL blood lead standard would be exceeded in an average of 6.1% of neighborhood children. When individual residences were evaluated, 13 on-site and one background exceeded EPA's 5% standard. Compared to background samples, on-site lead concentrations were found to be statistically higher than background concentrations.

POTENTIAL FUTURE RISKS

Only the residential scenario yielded cumulative cancer risks in excess of the range of acceptable risks defined in federal environmental laws and regulations, i.e., 1×10^{-6} to 1×10^{-4} (see Table S.ES-3). Most of the RME residential cumulative cancer risk would be from ingestion of arsenic in shallow or deep (sand unit) groundwater. Currently, there are no on-site drinking water wells, and residents obtain drinking water from the Mississippi River (Jaynes 1994). Again, arsenic and 2,3,7,8-TCDD (equivalents) were responsible for the majority of risks associated with the incidental ingestion of soil. Considerable uncertainty is associated with the cancer risk estimates for groundwater because it is unlikely to ever be used as a residential water supply.

Under future exposure conditions, only the residential scenario yielded noncancer HIs in excess of 1 (see Table S.ES-4). Again, the ingestion of groundwater contributed the most to the total adult and child HIs, and arsenic was the principal COPC. The hazard quotients (HQs) associated with the ingestion of groundwater from shallow wells were subsequently segregated according to target organ or system because the noncarcinogenic effects of some contaminants may not have cumulative or additive effects. The highest HIs for the RME adult, RME child, and average adult were 17, 40, and 12, respectively, reflecting HQs for neurological effects.

In the evaluation of lead in the undeveloped area, 37% of the children in a hypothetical future neighborhood were predicted to have blood lead levels exceeding 10 μg/dL. Consequently, childhood risks associated with lead significantly exceed EPA's 5% standard, reflecting relatively high lead concentrations in undeveloped area soils.

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Table ES-1

CURRENT SCENARIOS: CANCER RISKS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Exposure Scenario[a]	Exposure Pathway	Medium	RME[b]	Average
Residential	Incidental ingestion	Soil	1E-4	1E-5
	Dermal contact	Soil	3E-5	2E-6
	Inhalation	Outdoor Air	3E-4	7E-5
	Inhalation	Indoor Air	4E-4	1E-4
	Produce ingestion	Homegrown produce	3E-8	4E-9
Total Residential:			**8E-4**	**2E-4**
Worker	Ingestion	Soil	1E-5	8E-7
	Dermal contact	Soil	2E-5	2E-7
	Inhalation	Outdoor Air	1E-4	5E-5
Total Worker:			**2E-4**	**5E-5**
Trespasser	Ingestion	Soil	9E-6	---
	Dermal contact	Soil	6E-6	---
	Inhalation	Outdoor Air	3E-6	---
Total Trespasser:			**2E-5**	**NA**
Press Park	Incidental ingestion	Soil	2E-5	---
Community Center	Dermal contact	Soil	1E-5	---
Total Press Park Community Center:			**3E-5**	**NA**
Moton School	Incidental ingestion	Soil	3E-6	---
	Dermal contact	Soil	2E-6	---
	Inhalation	Outdoor Air	4E-6	---
	Inhalation	Indoor Air	7E-6	---
Total Moton School:			**2E-5**	**NA**

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) The cancer risk estimate is the sum of childhood and adult risks for RME.

Source: Ecology and Environment, Inc., 1994

Table ES-2

CURRENT SCENARIOS: NONCANCER HAZARD INDICES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Exposure Scenario[a]	Exposure Pathway	Medium	RME		Average
			Adult	Child	Adult
Residential	Incidental ingestion	Soil	0.1	0.9	0.1
	Dermal contact	Soil	0.09	0.1	0.02
	Inhalation[b]	Outdoor Air	0.05	0.05	0.05
	Inhalation[b]	Indoor Air	1	2	1
	Produce ingestion	Homegrown produce	2	4	1
Total Residential:			**2**	**5**	**1**
Worker	Ingestion	Soil	0.06	---	0.01
	Dermal contact	Soil	0.1	---	0.003
	Inhalation[b]	Outdoor Air	0.03	---	0.03
Total Worker:			**0.2**	**NA**	**0.01**
Trespasser	Ingestion	Soil	0.2	---	---
	Dermal contact	Soil	0.2	---	---
	Inhalation[b]	Outdoor Air	0.007	---	---
Total Trespasser:			**0.4**	**NA**	**NA**
Press Park	Incidental ingestion	Soil	---	0.7	---
Community Center	Dermal contact	Soil	---	0.3	---
Total Press Park Community Center:			**NA**	**1**	**NA**
Moton School	Incidental ingestion	Soil	---	0.1	---
	Dermal contact	Soil	---	0.06	---
	Inhalation[b]	Outdoor Air	---	0.02	---
	Inhalation[b]	Indoor Air	---	0.05	---
Total Moton School:			**NA**	**0.2**	**NA**

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) Inhalation HIs are not included in scenario totals as discussed in Section S.6.1.2.

Source: Ecology and Environment, Inc., 1994

Table ES-3

POTENTIAL FUTURE SCENARIOS
CANCER RISKS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL[a]
NEW ORLEANS, LOUISIANA

Exposure Scenario	Exposure Pathway	Medium	RME	Average
Residential (Shallow well)	Incidental ingestion	Soil	2E-4	2E-5
	Dermal contact	Soil	6E-5	2E-5
	Inhalation	Outdoor Air	2E-5	5E-6
	Ingestion	Groundwater (Shallow Well)[b]	2E-3	4E-4
	Inhalation	Groundwater (Shallow Well) [b,c]	---	---
	Dermal contact	Groundwater (Shallow Well)[b]	6E-6	1E-6
Total Residential (shallow well):			**3E-3**	**5E-4**
Residential (Deep well)	Incidental ingestion	Soil	2E-4	2E-5
	Dermal contact	Soil	6E-5	2E-5
	Inhalation	Outdoor Air	2E-5	5E-6
	Ingestion	Groundwater (Deep Well)[b]	3E-6	5E-7
	Inhalation	Groundwater (Deep Well)[b]	7E-8	1E-8
	Dermal contact	Groundwater (Deep Well)[b]	2E-6	4E-7
Total Residential (deep well):			**3E-4**	**4E-5**
Worker	Ingestion	Soil	2E-5	1E-6
	Dermal contact	Soil	3E-5	3E-7
	Inhalation	Outdoor Air	9E-6	3E-6
Total Worker:			**6E-5**	**5E-6**
Trespasser	Ingestion	Soil	1E-5	---
	Dermal contact	Soil	7E-6	---
Total Trespasser:			**2E-5**	**NA**

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) Exposure to groundwater assumes drinking water is derived from the maximally contaminated wells; "shallow wells" are 5 to 15 feet deep, and "deep wells" are 60 to 70 feet deep.
(c) No carcinogenic VOCs were detected in shallow wells.

Source: Ecology and Environment, Inc. 1994

Table ES-4

POTENTIAL FUTURE SCENARIOS
NONCANCER HAZARD INDICES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL[a]
NEW ORLEANS, LOUISIANA

Exposure Scenario	Exposure Pathway	Medium	RME		Average
			Adult	Child	Adult
Residential (Shallow Well)	Incidental ingestion	Soil	0.4	4	0.4
	Dermal contact	Soil	0.4	0.4	0.4
	Inhalation[b]	Outdoor Air	0.01	0.01	0.01
	Ingestion	Groundwater (Shallow Well)[c]	16	36	11
	Inhalation[b]	Groundwater (Shallow Well)[c]	0.00002	0.00003	0.00002
	Dermal contact	Groundwater (Shallow Well)[c]	0.04	0.06	0.03
Total Residential (shallow well):			**17**	**40**	**12**
Residential (Deep Well)	Incidental ingestion	Soil	0.4	4	0.4
	Dermal contact	Soil	0.4	0.4	0.4
	Inhalation[b]	Outdoor Air	0.01	0.01	0.01
	Ingestion	Groundwater (Deep Well)[c]	0.7	2	0.5
	Inhalation[b]	Groundwater (Deep Well)[c]	---	---	---
	Dermal contact	Groundwater (Deep Well)[c]	0.02	0.03	0.01
Total Residential (deep well):			**2**	**6**	**1**
Worker	Ingestion	Soil	0.1	---	0.02
	Dermal contact	Soil	0.2	---	0.01
	Inhalation[b]	Outdoor Air	0.01	---	0.01
Total Worker:			**0.4**	---	**0.04**
Trespasser	Ingestion	Soil	0.2	---	---
	Dermal contact	Soil	0.2	---	---
Total Trespasser:			**0.4**	---	---

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) Inhalation HIs are not included in scenario totals as discussed in Section 5.6.1.2.
(c) Exposure to groundwater assumes drinking water is derived from the maximally contaminated wells; "shallow wells" are 5 to 15 feet deep, and "deep wells" are 60 to 70 feet deep.

Source: Ecology and Environment, Inc. 1994

S.1 INTRODUCTION

This baseline human health risk assessment (HHRA) is a component of the Remedial Removal Integrated Investigation (RRII)/ Feasibility Study (FS) for the Agriculture Street Landfill (ASL) site in New Orleans, Louisiana. The objective of the baseline HHRA is to evaluate potential adverse health effects associated with site-related contaminants in the absence of remedial action. The results of the baseline HHRA will support decisions regarding the necessity and extent of remediation, development of site-specific cleanup levels, and selection of appropriate remedial technologies.

S.1.1 BASELINE HUMAN HEALTH RISK ASSESSMENT OVERVIEW

This section describes the general approach used to evaluate health risks at four areas within the ASL site: the developed area, including residential areas, Moton Elementary School (Moton School), and Press Park Community Center; and the undeveloped area. Sections of the RRII report in Volume I contain material pertinent to the baseline HHRA and are incorporated by reference:

- Site background, including site location and detailed descriptions, previous investigations, and environmental setting (Section 1);
- Investigative procedures, including sampling; geophysical, hydrogeologic, and air investigations; data quality assurance (QA)/quality control (QC); and data management (Section 2);

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- Nature and distribution of contamination (Section 4); and
- Contaminant fate and transport (Section 5).

The data evaluated in the baseline HHRA were derived from the 1994 RRII field investigation, as discussed in detail in the RRII report and summarized in Section S.3 of this document.

This baseline HHRA was conducted according to national and regional United States Environmental Protection Agency (EPA) guidance, including:

- *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual, Part A* (EPA 1989b);
- *Supplemental Region VI Risk Assessment Guidance* (draft; EPA 1992e); and
- *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors*, Office of Solid Waste and Emergency Response (OSWER) Directive 9285.6-03, March 25, 1991 (EPA 1991b).

Additional guidance includes *Exposure Factors Handbook* (EPA 1989a), *Dermal Exposure Assessment: Principles and Applications* (EPA 1992a), *Superfund Exposure Assessment Manual* (EPA 1988b), and *Final Guidance for Data Useability in Risk Assessment (Part A)* (EPA 1992b). Any deviations from standard risk assessment default factors or any changes in what is normally considered standard risk assessment procedures or protocol were discussed with EPA Region 6 risk assessment personnel.

S.1.2 ORGANIZATION OF THE BASELINE HUMAN HEALTH RISK ASSESSMENT

This baseline HHRA focuses on potential on-site exposures to the contaminants of potential concern (COPCs) at the ASL site. These potential on-site exposures were evaluated using exposure scenarios developed after site visits in collaboration with EPA Region 6 risk assessment personnel. The selected scenarios reflect site-specific current and future land use at the ASL site are described in Section 4, and depicted in Figure S.4-1. The use of the

future residential scenario does not necessarily imply that residential land use will occur in the undeveloped area. Rather, the most conservative (i.e., health-protective) exposure assumptions associated with residential land use were used to conservatively predict potential adverse health effects. This procedure is in accordance with EPA Region 6 guidance (EPA 1992e), which recommends that a future residential scenario should be assessed unless there is a strong reason to do otherwise (e.g., the area is highly industrialized or in an area of ecological concern).

Because lead was shown to be a significant contaminant at the ASL site in the expanded site inspection (ESI) (E & E 1993), a thorough evaluation of exposure to lead was performed using the latest version of the Integrated Exposure Uptake/Biokinetic (IEUBK) model (EPA 1994e). The IEUBK model requires the input of detailed, site-specific data from various media in residences. A subset of residential homes, townhouses, and apartments was selected randomly and combined with residences identified in the ESI to represent a group of homes herein referred to as study group residences (SGRs). The lead evaluation at the ASL site was performed in addition to the more standard exposure assessment and risk characterization.

Following this introduction, the baseline HHRA is organized according to the following sections:

- Site Description and History (Section S.2). This section briefly discusses the site setting and history;
- Identification of Contaminants of Potential Concern (Section S.3). This section describes the criteria used to eliminate chemicals from consideration in the baseline HHRA;
- Exposure Assessment (Section S.4). This section characterizes the exposure setting, identifies potentially exposed populations (i.e., receptors), identifies exposure scenarios and pathways, and quantifies exposure. Exposure point concentrations (EPCs) are presented in Attachments S.A and S.C, and the risk calculation spreadsheets are presented in Attachment S.B;

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- Toxicity Assessment (Section S.5). This section identifies toxicity values for each COPC. Health effects summaries for the COPCs are presented in Attachment S.D;

- Risk Characterization (Section S.6). This section evaluates potential health risks based on the estimated exposure intakes (identified in the exposure assessment) and the toxicity values (identified in the toxicity assessment). These risks are evaluated for the COPCs for each exposure pathway individually and for all pathways combined; and

- Conclusions and references (Sections S.7 and S.8, respectively).

Uncertainties associated with Sections S.3 through S.6 are discussed within each section.

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S.2 SITE DESCRIPTION AND HISTORY

S.2.1 SITE DESCRIPTION

The study area for the RRII includes the area within the defined boundaries of the ASL site and selected areas as designated by the EPA. The ASL site is defined by the operational boundaries of the former landfill.

The ASL site encompasses approximately 95 acres in New Orleans, Orleans Parish, Louisiana (see Figure 1-1, Section 1.3 of Volume I). New Orleans is a major seaport and trade center with established tourism, oil, and gas industries; however, its manufacturing base is relatively small (Trahan 1990). Historically, areas within the ASL site have been and remain predominantly residential, although some commercial, manufacturing, and retail and service businesses are located in the surrounding area. While this site description contains information pertinent to the baseline HHRA, additional details can be found in Volume I, Section 1.3. Specifically, information on surrounding land use and demography is presented in Sections 1.3.2 and 1.3.3 of Volume I.

The ASL site is located approximately 3 miles south of Lake Pontchartrain and 2.5 to 3 miles north-northeast of the city's central business district. The ASL site is bounded on the north by Higgins Boulevard and on the south and west by the Southern Railroad rights-of-way. The eastern boundary of the landfill extends from the cul-de-sac at the southern end of Clouet Street, near the railroad tracks, to Higgins Boulevard between Press and Montegut streets. A detailed description of the physical setting at the ASL site is provided in Section 1.4 of Volume I.

The ASL site includes approximately 47 acres that were developed from the 1970s through the late-1980s and currently supports single-family homes, multiple-family dwellings,

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Moton School, Press Park Community Center, a recreational center, and an electrical substation. The approximately 48 remaining acres are undeveloped and heavily vegetated. Each of the areas within the ASL site are clearly delineated in Figure 1-2 of Volume I of the RRII report.

The single-family homes located on the developed portion of the former landfill make up Gordon Plaza Subdivision. This subdivision is situated near the geographic center of the ASL site and, with the exception of the electrical substation, occupies the westernmost part of the developed area of the former landfill. Gordon Plaza subdivision is bounded by Benefit Street on the north, Industry Street on the south, and Press Street on the east. The western boundary of this subdivision is St. Ferdinand Street between Benefit and Abundance streets, and the undeveloped portion of the former landfill between Abundance and Industry streets.

Multiple-family dwellings on the developed portion of the former landfill consist of Housing Authority of New Orleans (HANO) structures and Gordon Plaza Apartments. The HANO housing area is situated in the northeast and east-central portion of the site. The HANO housing area is bound on the north by Higgins Boulevard and on the south by Abundance Street between Press and Feleciana streets. The western boundary of the HANO housing area is Gordon Plaza Apartments between Higgins Boulevard and Benefit Street, and Press Street between Benefit and Abundance Street. A few small stores that comprise the Gordon Plaza shopping center are also located along Higgins Boulevard directly north and adjacent to Gordon Plaza Apartments.

Moton School is located on Abundance Street between Press and Feliciana streets in the eastern portion of the ASL site. Press Park Community Center is located on the southeast corner of the intersection of Benefit and Press streets.

The recreational center is located in the southeastern portion of the ASL site, northwest of the intersection of Feliciana and Industry Streets. This recreational center has an indoor gymnasium that is used mainly for basketball. However, a playground structure is located in an open area north of the recreational center and south of the chain-link fence that forms the southern boundary of Moton School.

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An electrical substation is located within the northwestern portion of the former ASL boundaries, at the southwest corner of the intersection of the Almonaster Avenue and Higgins Boulevard. This substation is enclosed within a chain-link security fence.

The undeveloped area comprises the western and extreme southern portions of the ASL site and is heavily vegetated with a variety of trees, shrubs, and grass. A variety of wildlife, including insects, birds, rodents, and other animals, use the undeveloped area as a nesting ground. The Peoples Avenue and Florida Avenue Canals are located west and south, respectively, of this area. One abandoned structure is located on the undeveloped area southwest of the intersection of St. Ferdinand and Abundance Streets.

Before the field investigation, access to the undeveloped area was unrestricted, allowing unauthorized waste disposal. In an immediate removal action implemented concurrently with the RRII, EPA installed an 8-foot high, chain-link fence topped with barbed wire around the undeveloped area. Several vehicle gates were installed to facilitate access by utility companies and investigators during EPA-approved sampling events.

S.2.2 SITE HISTORY

Two descriptive titles were associated with the ASL site during its operational history. From the formal commencement of activities at the site in approximately 1909 until the late 1950s, when actual landfill activities began on a part of what became known as the ASL facility, the whole area was referred to as the Agriculture Street Dump (ASD). The site will be referred to as the ASD only in this site history section of the baseline HHRA; otherwise, it will be referred to by its more recent name, ASL, for consistency and clarity.

Records indicate that the ASD was first authorized for use as a dump in 1909. At that time, the garbage was composed primarily of household waste collected by city services and commercial waste from producers and private transporters (Schneider 1926).

By 1917, the New Orleans City Council began to examine garbage disposal alternatives, including an incineration and waste reduction system (Miller 1951). Five incinerators were built from 1916 to 1930 to help improve refuse disposal management in the city, and the informal, local neighborhood landfills and dumps were closed (Klorer 1925).

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In 1921, the City of New Orleans approved a plan that established the ASD as the receiving point for the city's garbage. Later, incinerator ash was also brought to the ASD. In 1922, the 400 tons of garbage produced each day by the residents of New Orleans were disposed of mainly at the ASD (Times Picayune 1922).

Through 1934, most household garbage was incinerated; however, the ASD remained in constant use prior to 1934 as the main disposal area for New Orleans's commercial refuse. After 1934, much of the city's garbage was deposited in the ASD because of financial constraints. During World War II, the absence of available labor at the local incinerators caused municipal and industrial waste to be taken to the ASD. In 1946, the ASD continued to be used as the main waste disposal area for New Orleans, but the city of New Orleans had grown to surround the ASD area so that it was no longer on the city's outskirts.

In 1948, area residents began to complain about the smell and smoke from occasional dump fires (Times Picayune 1948a; Schneider 1951). In response to uncontrolled fires and trespassers at the ASD (Times Picayune 1948a), the city transformed a portion of the ASD into a sanitary landfill. On October 6, 1948, the city began excavation on the northern part of the ASD to create the ASL. An 8-foot-high levee was constructed near St. Ferdinand Street, and three cells (two measuring 100 feet by 100 feet by 10 feet deep and one measuring 100 feet by 200 feet by 12 feet deep) were excavated to receive garbage (Times Picayune 1948b). In 1949, garbage was delivered to the sanitary landfill at Agriculture Street (Times Picayune 1949). It was also reported that during the 1940s and 1950s, the ASD/ASL area was routinely sprayed with DDT, a pesticide (Times Picayune 1994).

Apparently, some open burning continued at the landfill, and the public effort to close the facility intensified (New Orleans States 1950). Based on continued problems, legislation was enacted to close the ASL. Operations at the ASL were scheduled to end by 1952, despite a valid lease that continued through in 1953. According to the *Mayor's Annual Report for 1958*, the facility had been closed (New Orleans 1957-1958).

In 1962, newspapers reported that subsurface fires at the ASL continued to contribute to smog and a high incidence of asthma in the area, and excess fill was removed to resolve the problem (New Orleans States Item 1962). Approximately 300,000 cubic yards of excess

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fill from the ASL were disposed of in the Haynes Boulevard borrow pit and elsewhere, (Times Picayune 1962).

In 1965 and 1966, the ASL was used on an emergency basis to accept debris and spoiled foodstuffs resulting from Hurricane Betsy of September 1965 (Moghissi 1986). Although specific quantities are unavailable, records indicate that approximately 300 truckloads per day were disposed of in the ASL for a 6-month period (McFarland 1994). Open fires were set to burn much of the debris, and the area was covered with ash and compacted (Stant 1983). After this, the landfill was officially closed in 1966; however, it should be noted that an aerial photograph from 1967 shows some type of extensive operation continuing at the ASL.

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S.3 IDENTIFICATION OF CONTAMINANTS OF POTENTIAL CONCERN

This section describes the process used to sort, evaluate, and then select the COPCs that were evaluated in the baseline HHRA. The selection of COPCs was accomplished by the following steps:

- Initial data review and analysis (Section S.3.1); and
- Evaluation of frequency, range, and distribution of media-specific chemical concentrations (Section S.3.2).

Results of the COPC selection process were used to develop exposure point concentrations (EPC) that were used for chemical-specific input into exposure algorithms in Section S.4. The COPC selection results are presented in Section S.3.3, and uncertainties associated with this process are discussed in Section S.3.4.

S.3.1 DATA COLLECTION, EVALUATION, AND VALIDATION

The data evaluated were collected during the 1994 RRII field investigation. A detailed description of completed field investigations, including sampling locations and rationale, analytical results, and QA/QC considerations, is contained in preceding sections of this report as well as the Field Sampling Plan (E & E 1994b).

S.3.1.1 Data Review and Subdivision

To accomplish the data review and evaluation task, analytical data were subdivided by environmental medium. Specifically, data were divided into subsets including surface soil (0

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to 3 inches), subsurface soil (3 inches to 5 feet below ground surface [BGS]), shallow zone and sand unit categories for groundwater, indoor and outdoor air, and homegrown produce. Categories evaluated in the IEUBK model included sieved soil, first-draw and purged tap water samples, dust, and paint.

When a chemical was detected in some samples but not in others, one-half the detection limit was used as a surrogate exposure concentration for the undetected sample. If the maximum detected value exceeded the 95% upper confidence limit (UCL), the maximum value was used (EPA 1989b, 1992d). Some analytes that were considered for ingestion exposure pathways are considered essential elements or nutrients and were excluded from consideration in the baseline HHRA if maximum detected concentrations were less than their corresponding recommended daily allowances (RDAs) (National Research Council 1989; EPA 1993b, 1992e). This comparison is shown in Table S.3-1.

S.3.1.2 Evaluation of Data Qualifiers

Results of chemical analyses for soil and groundwater are summarized in Section 4 of the RRII The EPA Region 6 Houston laboratory and EPA Contract Laboratory Program (CLP) laboratories analyzed nearly all samples. A very small number of samples were analyzed by laboratories outside the CLP that use EPA-approved standard methods and protocols. Data validation qualifiers were applied according to CLP validation criteria (EPA 1989b). Data quality and usability criteria are presented in detail in Appendix J of the RRII report and will be only summarized here.

Chemicals detected at concentrations 10 times or less (for common laboratory contaminants) or five times or less (for all other substances) than the maximum concentration reported in any method or field blank were considered artifacts of sampling and analysis methodology (EPA 1989b) and were excluded from evaluation. Rejected (*R*-qualified) data were not used, but estimated (*J*-qualified) data were used to estimate the EPCs as recommended by EPA (1989b).

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Review of data qualifiers and reports indicated that the volume and quality of all data collected at the ASL site were adequate for use in the risk assessment. Because only a relatively small fraction of the total data was not usable for the HHRA, impacts to the baseline HHRA were negligible.

S.3.2 FREQUENCY AND RANGE OF CHEMICAL CONCENTRATIONS

For this step of the COPC selection process and in all subsequent evaluations, the data were subdivided by site area and environmental medium. Samples were selected based on the validation and laboratory contaminant criteria described above. The locations, frequency of detection, minimum and maximum sample quantitation and detected concentrations of samples evaluated herein are presented in Section 4 of the RRII. The frequency of detection is the number of samples in which a chemical was positively detected divided by the total number of samples analyzed for that chemical.

Per discussion with EPA Region 6, chemicals were eliminated as COPCs in soil if they were detected positively in less than 5% of the total number of samples analyzed and there were at least 20 samples (Lessard 1994a). This approach was not used for evaluating COPCs in groundwater, however, because a single monitoring well could represent the sole source of domestic water for a residence. Nor was this approach used for air or garden produce samples because fewer, less representative samples were obtained. As recommended by EPA guidance, unfiltered groundwater data were used to evaluate groundwater exposure pathways (EPA 1989b). Chemicals were not eliminated from the assessment based on comparison to background per discussion with EPA Region 6 (Lessard 1994a).

S.3.3 RESULTS OF CONTAMINANTS OF POTENTIAL CONCERN SELECTION

The objectives of the contaminant screening were to identify site-related COPCs in terms of their effects on human health and to select a dataset of reported concentrations that is of acceptable quality for use in the baseline HHRA. The results of the COPC selection process, as well as the associated exposure point concentrations, are shown in the tables provided in Attachment S.A. Specifically, Tables S.A-1 to S.A-4 contain surface and subsurface organic and inorganic COPCs; Tables S.A-7 through S.A-10 contain COPCs for

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Moton School; Tables S.A-11 and S.A-12 contain COPCs for the Press Park Community Center; Tables S.A-13 through S.A-17 contain COPCs for the undeveloped area; Tables S.A-18 through S.A-21 contain COPCs for groundwater; and Table S.A-22 contains garden produce COPCs.

S.3.4 CONTAMINANTS OF POTENTIAL CONCERN SELECTION UNCERTAINTIES

Uncertainties associated with the COPC selection process originate from the analytical data and the COPC evaluation process. The effects of these uncertainties on the baseline HHRA are presented below.

S.3.4.1 Analytical Data Uncertainties

All analytical results, not only those identified as estimated (i.e., *J*-flagged) during the data validation process, possess some inherent variability. This variability or uncertainty in the true result depends on several factors, such as the sample matrix, analytical method, and the analytical laboratory performing the analysis. A variability of plus 100% to minus 50% is common for analytes detected at concentrations less than the contract-required quantitation limit. For samples containing higher contaminant concentrations, relative percent differences of 35% for soil are considered acceptable (EPA 1988a).

Additional uncertainty is associated with the possible unintentional exclusion of chemicals from the COPC selection process. Although the field investigation included all areas where site-related chemicals were suspected, some analytes may have been excluded. Thus, chemicals that may be present on-site, but that were not identified during field investigations, could result in underestimation of total site risks. However, given the extensive number of samples collected and the number of different analytical procedures performed at the ASL site, it is very unlikely that site-related chemicals were excluded.

S.3.4.2 Contaminants of Potential Concern Selection Procedure Uncertainties

Not all chemicals detected in environmental media at the ASL site were selected as COPCs. Chemicals detected in less than 5% of soil samples were excluded from the baseline

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HHRA. Consequently, the COPC evaluation approach described in this baseline HHRA focused on the chemicals that pose the dominant risks at the ASL site. The COPC evaluation process did not eliminate chemicals from consideration unless they were detected infrequently and at concentrations presenting minimal potential site risks. Thus, it is unlikely that any of the chemicals excluded from the selection process pose a significant human health risk.

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Table S.3-1

COMPARISON OF MAXIMUM DETECTED SOIL (0 TO 3 INCH) CONCENTRATIONS TO RECOMMENDED DAILY ALLOWANCES HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Chemical	Maximum Detected Concentration (mg/kg)	Daily Intake[a] (mg/day)	RDA[b] (mg/day)	Ratio	Chemical Evaluated?
Calcium	123,000	123	1,200	0.10	No
Chromium	213	0.213	0.2	1.1	No
Copper	6,150	6.15	3	2.1	Yes
Iron	253,000	253	30	8.4	Yes
Magnesium	5,070	5.07	400	0.01	No
Manganese	2,920	2.92	5	0.6	No
Potassium	4,740	4.74	2,000	0.002	No
Selenium	2.3	0.0023	0.075	0.03	No
Sodium	1,570	1.57	500	0.003	No
Zinc	7,740	7.74	19	0.4	No

(a) Daily intake (DI) assumes ingestion of 100 mg (1E-4 kg) of soil per day.
(b) RDA = Recommended Daily Allowance (National Research Council 1989).

Source: Ecology and Environment, Inc., 1995

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S.4 EXPOSURE ASSESSMENT

The purpose of the exposure assessment is to evaluate the potential for human contact to COPCs selected for evaluation in Section S.3. The routes, duration, frequency, and magnitude of these potential exposures are estimated in this section. The exposure scenarios evaluated for a site generally depend on the populations potentially exposed and the types of land use at the site. A conservative residential exposure scenario was used at the ASL site because of extensive residential development. Young children (e.g., ages 1 through 6 as well as 6 through 12) are subpopulation groups of special concern separately evaluated at this site because of increased contact with and possible increased sensitivity to site-related contamination.

This baseline HHRA focuses on the most significant exposure pathways and scenarios (Figure S.4-1). While it is recognized that not all potential receptors and pathways are evaluated, the presented approach is sufficiently conservative so that it is health-protective of other potential scenarios.

The exposure assessment includes the following steps:

- Characterize the exposure setting,
- Identify exposure pathways,
- Identify exposure scenarios,
- Quantify exposure, and
- Identify uncertainties associated with the exposure assessment.

Section 5.4.6 presents an evaluation of exposures to lead-contaminated media used in the IEUBK model. The following subsections present the exposure assessment according to the above steps.

S.4.1 EXPOSURE SETTING AND LAND USE

The first step in the exposure assessment is to characterize the ASL site in terms of its physical setting, land use, and the associated human populations that may be exposed to site-related contaminants. This information is used to identify possible exposure pathways for each potentially exposed population and the appropriate exposure factors to quantify exposure. A general description of the ASL site is provided in Section S.2. Greater detail is provided in Section 1.3 of the RRII. Detailed descriptions of each site area evaluated in the baseline HHRA are presented below.

For the purposes of this assessment, it was assumed that future residential land use will occur at the site. This assumption was made because evaluation of future residential scenarios is required by EPA Region 6 unless substantive justification is provided to exclude this possibility (EPA 1992e). Because future land-use planning for the undeveloped and residential areas are unknown, a residential exposure scenario was assumed in evaluating this area. Future residential development may not be the most appropriate scenario for calculating cleanup levels. However, residential risk estimates may be used for risk management decisions. The following discussion presents setting and land-use information for each site area. A comprehensive discussion on the rationale for dividing the site into developed and undeveloped areas is provided in Section 3 of the RRII.

S.4.1.1 Developed Area

Current Setting and Land Use

The developed area of the ASL site is approximately 47 acres and includes single-family homes and multiple-family dwellings, Moton School, and Press Park Community Center. In addition, an electrical substation is west of Almonaster Avenue, just south of the

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intersection with Higgins Boulevard. This substation is enclosed within a chain-link security fence. Per EPA Region 6 direction, the Moton School and Press Park Community Center were considered separately in the baseline HHRA (Lessard 1994b). These areas are discussed separately in S.4.1.2 and S.4.1.3.

Gordon Plaza Subdivision comprises single-family homes on the developed area. This subdivision is approximately in the center of the ASL site and is the western portion of the area developed for housing. Gordon Plaza Subdivision consists of single-family homes on small rectangular and polygonal lots. Lots generally contain small front yards and back yards; fences separate adjacent properties and front yards from back yards. Some back yards contain gardens and play areas for children.

Multiple-family dwellings on the developed area consist of HANO housing and Gordon Plaza Apartments. HANO housing is in the northeast and north-central part of the study area and consists of two-story, brick structures. Each building contains several individual housing units, connected by a common wall, and has a grass-covered common area behind the building and paved parking areas and access roads to the front.

Gordon Plaza Apartments are located in the northwest portion of the study area. Several small convenience stores that comprise the Gordon Plaza shopping center are along Higgins Boulevard, directly north and adjacent to Gordon Plaza Apartments. Apartments consist of a series of two-story buildings arranged in a square with a common yard in the middle. These apartments provide housing for physically-challenged, older persons. A fence surrounds the apartment complex, excluding the block of small convenience stores.

Future Land Use

The future land use at the ASL site is unknown. However, because the developed area is used for residential purposes, and zoned residential (single, two-family, and multiple structures [City Planning 1994]), continued residential use of this area is anticipated. Therefore, future land use is assumed to be residential.

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S.4.1.2 Moton Elementary School

Current Setting and Land Use

Moton School is on Abundance Street, between Press and Feliciana streets in the southeastern portion of the developed area. The school is a two-story, brick structure that contains classrooms, a cafeteria, a library, administrative offices, and other operational areas. Five hundred fifty-four students were enrolled as of February 1994 (Glapion 1994).

The school property, except for the main entrance on the north side and a parking lot on the east side, is surrounded by a chain-link fence. The western and southern areas of the school property are open playground areas where school children play during recess and lunchtime. Children from the surrounding residential area use the school yard year-round for recreational purposes. Swings and slides are located in the western area of the playground. The eastern area of the school property contains parking areas and provides access to the cafeteria. A small percentage of the children attending Moton School live at the ASL site. A large, grass-covered field (Mugrauer Playground) is immediately south of the southern school fence line.

Future Land Use

For the purposes of the HHRA, future land use at Moton School is assumed to be the same as current (through July 1994) land use. However, it is noted that the Moton School was closed effective August 26, 1994, in response to the proposal to include the ASL site on the National Priorities List (Sunday Advocate 1994).

S.4.1.3 Press Park Community Center

Current Setting and Land Use

Press Park Community Center is in the east-central portion of the developed area, on the southeast corner of the intersection of Benefit and Press streets. The community center property contains a one-story, brick building; a parking lot south of the building; and open areas east of the building and south of the parking lot. Playground equipment is located in the open area in the western portion of the property. ASL site residents use the center for community events, and children use open areas as a playground year round.

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Future Land Use

Future land use at Press Park Community Center is assumed to be the same as current land use.

S.4.1.4 Undeveloped Area

Current Setting and Land Use

The approximately 48-acre undeveloped area of the landfill comprises the western and southern areas of the ASL site. Peoples Avenue and Florida Avenue canals are west and south, respectively, of the undeveloped area of the site.

The undeveloped area is heavily vegetated with a variety of trees, shrubs, and grasses. A variety of wildlife, including insects, birds, rodents, and other animals, uses the undeveloped area for nesting. An abandoned structure, the former recycling facility, is located southwest of the intersection of St. Ferdinand and Abundance streets.

Before the RRII fieldwork, access to the undeveloped area was unrestricted, allowing unauthorized dumping; during RRII fieldwork, an 8-foot-high, chain-link security fence was erected around the undeveloped area. Trespassers and transients were observed in the undeveloped area. Despite recent fence construction, reoccupation of this area may occur.

Future Land Use

Future land use of the undeveloped area is uncertain; this area is zoned light industrial (City Planning 1994). As mentioned in Section S.4.1.1, residential use is expected because the surrounding areas are mostly residential.

S.4.2 IDENTIFICATION OF EXPOSURE PATHWAYS

An exposure pathway describes the course a chemical takes from a source to an exposed individual. A complete exposure pathway must exist for a contaminant to pose a potential human health risk and must consist of the following four elements:

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- A mechanism for contaminant release to the environment;
- An environmental transport medium (e.g., soil or air) for the released contaminant;
- A point of potential human contact with the contaminated medium (e.g., soil in a residential yard); and
- An exposure route (e.g., incidental ingestion of contaminated soil) at the exposure point.

If an exposure pathway is incomplete, then it can be concluded that no potential for human exposure exists. Consequently, adverse effects to human health are not expected to occur. The exposure pathways evaluated in this assessment are shown in Figure S.4-2.

Sources of contamination and actual or potential mechanisms of release and transport for the ASL site are described in more detail in the work plan (E & E 1994a) and Section 5 of the RRII (Volume 1). The potential for contact and exposure route elements for each environmental medium of concern are described below.

S.4.2.1 Surface Soil

Current and future receptors are most likely to come into contact with site-related contaminants by incidental ingestion of and dermal contact with surface soil. Exposure is most likely for children who frequently may contact surface soil during outdoor play. Adult residents also may be exposed to contaminants in surface soil while handling outdoor pets, gardening, or engaging in other outdoor activities. Workers and trespassers may be exposed to contaminants in surface soil by incidental ingestion and dermal contact. Therefore, potential exposures to volatiles in surface soil were considered as described in Section S.4.2.

S.4.2.2 Subsurface Soil

The most likely pathway by which current residents could be exposed to subsurface soil is inhalation of volatile organic compounds (VOCs). This exposure is evaluated and discussed in Section S.4.2.4. Future excavation activities, such as those associated with residential development, could result in exposure to subsurface soils at the surface. If these

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soils are exposed, contact is possible through ingestion and dermal contact. Workers have been observed in the developed area, presumably maintaining utility infrastructure and/or possibly repairing subsidence-damaged underground utilities. Therefore, current and future industrial exposure pathways were evaluated.

S.4.2.3 Groundwater

Contact with on-site groundwater is an incomplete exposure pathway because this medium is currently not used as a source of domestic tap water or for any other known purpose. If groundwater were used as a future residential water supply, residents would be exposed to chemicals in this medium through ingestion. Residents also may be exposed by inhaling substances that volatilize during bathing and other domestic activities as well as dermal exposure to contaminants in groundwater while bathing. Therefore, risks associated with this potential future exposure pathway were also evaluated.

S.4.2.4 Air

Human exposure to contaminants in air may occur by inhalation of volatiles released from soil or other site-related media. Therefore, ambient air data collected indoors and outdoors at the ASL site was used to assess potential risks associated with this medium.

Potential exposures to contaminants associated with fugitive dusts were not considered because the ASL site is extensively vegetated and areas that are not vegetated contain buildings or are paved with asphalt or concrete. Additionally, the heavy rainfall associated with the subtropical climate at the ASL site tends to minimize dusty conditions, thereby preventing release and transport of contaminants by this pathway. Therefore, inhalation of particulate-bound contaminants is not expected to be a significant exposure pathway.

S.4.2.5 Produce

Consumption of contaminated produce is a potentially significant exposure pathway and could contribute to an individual's overall risk from site-related contaminants. Four

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produce samples were collected from gardens at two SGRs. These data were used with the exposure algorithm presented by EPA (1989b) to quantify risks to site residents from ingestion of homegrown produce containing site-related chemicals.

S.4.2.6 Surface Water

Surface water is typically present in the man-made Florida Avenue and Peoples Avenue canals. These canals collect water from storm drains. As discussed in the Ecological Risk Assessment (Section 7 of Volume I), this surface water does not contain fish. The canals are constructed with walls that are approximately 10 feet in height, which makes it difficult for persons to access the surface water in the canals. Given the lack of probable exposure to surface water and the lack of fish in the canals as a food source, a decision was made in concert with EPA not to evaluate the surface water and fish consumption exposure pathways (Lessard 1994b).

S.4.3 IDENTIFICATION OF EXPOSURE SCENARIOS

An exposure scenario consists of several exposure pathways that are evaluated in combination to estimate the potential exposure to an individual. The potential current and future exposure pathways evaluated for the ASL site are summarized in Table S.4-1. Each pathway was evaluated to determine whether it is complete or likely to be complete in the future.

As described in Section S.4.2, this baseline HHRA focuses on residential, industrial, and trespasser scenarios for current and future land-use conditions. The potential risks calculated for these individuals are designed to be protective of other potentially exposed populations (i.e., off-site residents and site visitors). Additionally, because of the young age and sensitivity of children, a separate evaluation was conducted for Moton School and Press Park Community Center. The exposure pathways and scenarios evaluated in the baseline HHRA are presented in Table S.4-2.

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S.4.4 QUANTIFICATION OF EXPOSURE

This section describes the calculation of potential exposure to contaminants through the identified exposure pathways. Estimates of chemical intake are based on EPCs at the point of exposure and on the estimated duration and frequency of exposure to contaminated media. Derivation of these estimates is described in the following subsections.

S.4.4.1 Exposure Point Concentrations

The EPCs presented in Attachment S.A were calculated using specific site data, as described in Section S.3. Specific datasets used to calculate EPCs are summarized for each exposure pathway in Table S.4-2. Specifically, Tables S.A-1 to S.A-4 contain surface and subsurface organic and inorganic EPCs; Tables S.A-7 through S.A-10 contain EPCs for the Moton School; Tables S.A-11 and S.A-12 contain EPCs for the Press Park Community Center; Tables S.A-13 through S.A-17 contain EPCs for the undeveloped area; Tables S.A-18 through S.A-21 contain EPCs for groundwater and Tables S.A-22 and S.A-23 contain garden produce and 2,3,7,8-TCDD (equivalent) EPCs.

From these data, EPCs were derived by calculating the 95% UCL on the arithmetic mean (EPA 1992d). When datasets contained greater than 30 samples but relatively few positive detections were observed (i.e., "left-censored" data), UNCENSOR 3.0 (©1992 Savannah River Ecology Laboratory) was used. UNCENSOR uses Helsel's probability plotting method to interpret left-censored data. This is accomplished by fitting site data to a log-normal distribution above the detection limit and then extrapolating to values below the detection limit. The extrapolated values then are combined with data above the detection limit to compute the 95% UCL. Left-censored data were encountered only for several indoor air samples, as discussed below.

Data collected during the ESI (E & E 1993) just outside the study area boundary were also compared to on-site lead concentrations to determine whether they would be appropriate to represent background concentrations. The lead concentrations detected during the ESI were significantly higher than background concentrations. Furthermore, much of these data were deliberately collected in areas expected to be contaminated, and consequently, may have been

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influenced by site contamination. Therefore, the ESI data were not combined with the background RRII data to represent background concentrations.

S.4.4.1.1 Exposures to Soil

EPCs for current residential exposures to soil (e.g., dermal contact and soil ingestion) were calculated from the surface soil grid samples collected at the developed area of the site. EPCs for future residential exposures to soil were derived from the surface soil grid samples collected from the undeveloped area and from any subsurface data available. As recommended by EPA Region 6 guidance (EPA 1992e), a log-normal distribution was assumed for each dataset. Surface and subsurface soil data were combined to account for exposure to all soil horizons. For current worker scenarios, EPCs for soil were again derived by combining surface and subsurface datasets plus any exploratory soil boring or test pit samples in the developed area. For future worker scenarios, the same surface and subsurface soil data from the undeveloped area were used to develop EPCs. For Moton School, EPCs for soil were derived from the nine surface soil grab samples collected from play areas on the west and south sides of the school yard as discussed in Volume I, Section 4.1.4.3, of the RRII report. Press Park Community Center soil EPCs were derived from five surface soil samples for inorganics and from the developed area surface soil grid samples for organics.

The EPCs for dioxin and furan compounds are expressed as 2,3,7,8-TCDD equivalents (EPA 1989g) listed in Table S.5-4. In the developed area, subsurface 2,3,7,8-TCDD (equivalent) data collected at the SGRs were used to evaluate current worker exposures to soil. These subsurface 2,3,7,8-TCDD (equivalent) EPCs were similar to those derived from subsurface samples collected at Moton School (2.28E-4 versus 2.32E-4 mg/kg) and therefore were used to represent exposure to workers at Moton School. For current residential exposure estimates, data from both undeveloped area surface soil and developed area subsurface soil were used. Both undeveloped area surface soil and developed area subsurface soil 2,3,7,8-TCDD (equivalent) exposure point concentrations were similar (3.9×10^{-4} versus 2.25×10^{-4} mg/kg, respectively), but the higher value was selected to be protective to residents who do not have clean fill. In the undeveloped area, the 25 randomly collected

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surface soil 2,3,7,8-TCDD (equivalent) samples were used to evaluate the future exposures to soil for residents and workers, and current and future exposures to trespassers.

In the calculation of 2,3,7,8-TCDD (equivalent) concentrations, samples with zero equivalent concentrations were excluded from the risk assessment using a procedure described in EPA 1989b. This approach is less conservative than that used to derive EPCs for the other COPCs, in which one-half the sample quantitation limit (SQL) was used as the surrogate concentration for nondetected concentrations, but it was necessary because some congeners had relatively high one-half detection limit values which would have presented unrealistically high risks. Consequently, the 2,3,7,8-TCDD (equivalent) concentrations presented in this baseline HHRA may slightly underestimate the EPCs for PCDDs and PCDFs.

S.4.4.1.2 Exposures to Groundwater

There are no on-site wells are used for drinking water. Drinking water is received from the Mississippi River (Jaynes 1994). Therefore, groundwater was evaluated assuming future residential use of this medium. Because it is possible that an individual monitoring well could represent the sole source of domestic water for a residence, and because the most contaminated wells represent worst-case conditions, the arithmetic average of sample data obtained from the most contaminated, "center of the plume" wells was used to estimate EPCs. To determine which wells were most contaminated, wells were ranked according to number of MCLs exceeded. Wells 36, 29, and 21 were found to exceed MCLs most frequently when unfiltered data from these shallow zone wells were compared to MCLs.

If drinking water wells are installed on site in the future, it is uncertain whether they would be installed in shallow or deep water-bearing units. Therefore, two exposure scenarios were evaluated for drinking water exposure pathways: one assumes water is pumped from the shallow zone wells (5 to 15 feet) and one that assumes water is pumped from the deeper sand unit wells (60 to 70 feet). The deep (sand unit) well EPC was derived from collocated well Nos. 30 and 22; shallow zone well 36 did not have a collocated deep well. For each scenario, EPCs were estimated using the arithmetic average for unfiltered concentrations from the one sampling event conducted at the site.

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S.4.4.1.3 Exposures to Air

Indoor and outdoor air samples were collected and analyzed for VOCs at all SGRs. As mentioned above, left-censored data were encountered for several VOCs in the SGR samples, and UNCENSOR was used to calculate the EPC.

For Moton School air inhalation pathways, the two indoor air VOC sample data were used to calculate the EPCs. Chemicals where this technique was used are noted in Tables S.A-5 and S.A-6. For Moton School, two samples (one collected on the second floor and one collected on the first floor) were used to calculate the EPCs for air. A single outdoor sample collected at the Moton School was used for the outdoor air EPC.

S.4.4.1.4 Exposures to Produce

Four types of homegrown produce (cabbage, garlic, parsley, and carrots) were collected from two of the SGRs to calculate EPCs for this exposure medium. Because of the small number of samples, the maximum detected concentrations of each analyte were used as the EPC.

S.4.4.1.5 Fate and Transport Modeling

A simple modeling algorithm was used to approximate EPCs for the inhalation of VOCs present in groundwater under future land-use conditions. The EPCs for VOCs in indoor air resulting from the use of groundwater for showering were derived using Andelman's (1990) water volatilization factor of 0.5 liters per cubic meter (L/m^3) (EPA 1991e). This factor was applied to groundwater concentrations of VOCs to estimate vapor phase concentrations.

S.4.4.2 Exposure Factors

The objective of this baseline HHRA is to determine the potential risks associated with reasonable maximum exposure (RME) and average (central tendency) exposure conditions at the ASL site. EPA (1989c) defines RME as the "highest exposure that is reasonably expected to occur at the site." Thus, to provide a range of risk estimates, the potential risks

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posed to theoretical maximally exposed individuals were evaluated as were risks to average exposed individuals in residential and industrial scenarios.

According to EPA (1989b, 1992d), the RME and average exposure calculations should be used in Superfund risk assessments. The RME, defined as the highest exposure that reasonably could be expected to occur by a given exposure pathway, is intended to account for uncertainty in contaminant concentration and variability in exposure parameters, such as exposure frequency and averaging time. The RME, sometimes called the "high-end" risk, characterizes risk to an individual "at the upper end of the risk distribution at approximately the 90th percentile of the population distribution" (EPA 1992f). The goal of the RME approach is to combine upper-bound and mid-range exposure factors to estimate exposures that are protective and reasonable but not worst-case (1991b).

The central tendency or average, however, incorporates default exposure factors approximating the average of 50th percentile value. The arithmetic mean is the sum of the concentrations divided by the total number of concentration values.

Because of the uncertainty associated with estimating the true average concentration at a site, the 95% UCL of the arithmetic mean is used as the concentration term in the RME calculations. The 95% UCL provides reasonable confidence that the true site average will not be underestimated (EPA 1989b, 1992d). This estimate of the average concentration also is used because carcinogenic and chronic noncarcinogenic toxicity criteria are based on lifetime average exposures and because average concentrations are most representative of the concentration that would be contacted at a site over an extended period of time.

To calculate potential exposure to contaminants through the identified exposure pathways, chronic daily intakes (CDIs) and lifetime average daily intakes (LADIs) for evaluating noncarcinogenic and carcinogenic effects, respectively, in addition to absorbed doses (for dermal exposures), were calculated. CDIs, LADIs, and absorbed doses are expressed in milligrams of contaminant per kilogram of body weight per day (mg/kg/day) and were calculated for each contaminant. Calculation of CDIs, LADIs, and absorbed doses involves numerous estimated exposure factors that are shown in the risk calculation spreadsheets (see Attachment S.B). Default exposure factors were obtained from the following EPA sources:

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- *Central Tendency and RME Exposure Parameters* (EPA 1992c),
- *Supplemental Region VI Risk Assessment Guidance* (EPA 1992e),
- *Standard Default Exposure Factors* (EPA 1991b),
- *Exposure Factors Handbook* (EPA 1989a), and
- *Dermal Exposure Assessment: Principles and Applications* (EPA 1992a).

The two EPA Region 6 sources provide standard exposure assumptions and were the main sources of exposure factors used to quantify exposure. However, when a value listed in the Region 6 guidance was obtained from federal risk assessment guidance, the original source was cited.

The potential exposure of any individual to contaminants depends on such factors as individual activity patterns, location-specific chemical concentrations, and other site-specific factors. The exposure factors employed in the baseline HHRA and a brief rationale for their use are provided in Tables S.4-3 through S.4-20. The following text provides additional details on the exposure assumptions.

S.4.4.2.1 All Pathways

All exposure equations used in this baseline HHRA (except ingestion of garden produce) conservatively assume that 100% of the contaminants contacted in the residential scenario were derived from the ASL site, which is very conservative for an urban setting. Consequently, the fraction ingested (FI) and inhaled fraction from the contaminated source were assumed to be 1.0. For ingestion of garden produce, the FI was assumed to be 0.4 and 0.25 for the RME and average scenarios, respectively. These values reflect the percentage of homegrown vegetables in an individual's diet (EPA 1989b).

S.4.4.2.2 Vapor Inhalation Pathway

For the purposes of this baseline HHRA, inhaled material was assumed to be absorbed entirely in the lungs. This assumption represents a conservative approach because it is very unlikely that 100% of inhaled volatiles would be absorbed.

S.4.4.2.3 Dermal Exposure with Soil

EPA (1992a) describes the procedure used to evaluate dermal exposure to COPCs. EPA Region 6 provides percutaneous absorption values (EPA 1992e). Specifically, these were assumed to be 0.1% and 1% for metals and organics, respectively.

S.4.4.2.4 Children at Moton Elementary School and Press Park Community Center

A relatively conservative scenario was developed for school-aged children (grades 1 through 6) who attend Moton School or visit Press Park Community Center. These scenarios are considered together here because the individuals most likely to be exposed are the same age (6 to 12); consequently, the same exposure factors were used for assessing these scenarios. The exposure duration was assumed to be 350 days/year for outdoor exposure pathways because children could play at either area all year, regardless of whether school is in session. The exposure duration was assumed to be 180 days/year for inhalation of indoor air vapors. This value was derived assuming that school is in session for five days per week for 36 weeks per year. The exposure parameters for inhalation rate, skin surface area, and body weight were derived based on values provided by EPA (1989a).

S.4.4.2.5 Trespasser Scenario

For the purposes of the baseline HHRA, a relatively conservative trespasser scenario was developed; transient adults were assumed to be exposed to on-site environmental media in the undeveloped area for 180 days/year for 10 years (EPA 1992e). This scenario is inconsistent with EPA Region 6 guidance, which recommends an adolescent site visitor exposed for 60 days/year (EPA 1992e). However, the exposure frequency was increased because transient individuals were observed to be residing in the undeveloped area (Lessard 1994b). All of the individuals' daily soil ingestion was conservatively assumed to occur while they are at the undeveloped area. For the outdoor soil gas inhalation pathway, the fraction inhaled from the contaminated source was conservatively assumed to be 1.0.

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S.4.5 EXPOSURE ASSESSMENT UNCERTAINTIES

Several factors could cause the estimated exposure levels to differ from actual exposures. This section identifies these factors; discusses the potential effects of the factors on the exposure estimates; and where possible and appropriate, estimates the degree of confidence that should be placed in the various assumptions and parameter estimates that comprise the exposure estimates.

S.4.5.1 Environmental Sampling

Samples collected during the field investigations are intended to characterize the nature and distribution of contamination and allow an evaluation of impacts to human health at the ASL site. Accordingly, samples at some locations (e.g., at the SGRs, the Moton School, and the perimeter/interior monitoring wells) were collected from locations selected in a purposeful or directed manner to accomplish this goal. Samples collected in this manner provide considerable information about the ASL site, but do not statistically represent the contamination that may be present on the ASL site as a whole. To account for this bias, additional samples were collected on a 200-foot-by-200-foot grid across the entire site to provide a statistically representative characterization of typical exposure at the ASL site. Finally, limited data were available for some media (e.g., produce).

This sampling strategy provided 52 samples from the developed portion of the site and 52 samples from the undeveloped portion of the site and corresponds to a 79% probability of hitting a 100-foot radius hot spot (EPA 1992i). Therefore, there is only marginal uncertainty in under-representation of site contamination.

S.4.5.2 Exposure Point Concentrations

The proposed estimate of the RME for soil is a product of several terms, including the 95% UCL on the arithmetic mean of contaminant concentration at each area. The mean is averaged over temporal and spatial scales. EPA (1993c) recommends that methods that account for spatial distribution of contaminants be incorporated into the risk assessment process. Another concern regarding the UCL is that many of the statistical assumptions inherent in its calculation may be violated. For example, use of the 95% UCL requires that

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the sample locations are chosen randomly and that the data are either normally or log-normally distributed. The manner in which nondetects are incorporated into the calculation of the 95% UCL also affects the result. Specific to this baseline HHRA, considerable uncertainty is associated with deriving future EPCs by combining surface soil and subsurface soil data (or using only subsurface soil data if surface soil data are unavailable). This approach assumes that soil disturbance will occur in the future, resulting in a mix of the present subsurface soil with surface soil. Overall, the methodology used to calculate EPCs likely overestimates potential exposures.

Tables S.A-1 to S.A-4 contain surface and subsurface organic and inorganic EPCs; Tables S.A-7 through S.A-10 contains EPCs for Moton School; Tables S.A-11 and S.A-12 contain EPCs for the Press Park Community Center; Tables S.A-13 through S.A-17 contain EPCs for the undeveloped area; Tables S.A-18 through S.A-21 contain EPCs for groundwater; and Tables S.A-22 and S.A-23 contain garden produce and 2,3,7,8-TCDD (equivalent) EPCs.

S.4.5.3 Fate and Transport Modeling

Andelman's volatization factor was used to estimate VOC volatization from groundwater and subsequent inhalation (Andelman 1990). This factor is subject to uncertainty because it assumes equal volatility for all VOCs.

S.4.5.4 Exposure Parameters

The main uncertainty regarding exposure estimation calculations is associated with selection of appropriate parameter values. The values used, and a brief rationale for their selection, are presented in Tables S.4-3 through S.4-20. Individual parameter values were selected so that the overall pathway exposure estimates would approximate high-end (RME) and average (central tendency) exposures.

The exposure parameters used in calculating the exposure estimates were obtained mainly from EPA guidance. These values are intentionally conservative and designed to err on the side of overestimating exposure; therefore, there is considerable uncertainty regarding the actual exposure that a receptor would experience. Another major source of uncertainty in

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the quantitative aspect of risk assessments is the propagation of error. The calculation of risk is a sequential process with assumptions in one calculation carried forward as assumptions in the next calculation. As a result, the errors are compounded at each step in the assessment.

The FI was assumed to be 1.0 although indoor and outdoor inhalation comprise portions of an individual's total intake. All chemicals were assumed to be absorbed across the skin although many chemicals may have limited dermal absorption.

S.4.5.5 Future Land Use

Future residential scenarios were assumed for all evaluated site areas. However, uncertainties arise because of difficulties in accurately predicting future land use. The future residential land-use assumption overestimates the true future risks because the entire ASL site may not necessarily be developed into residential property. In fact, future industrial or recreational development scenarios would generally result in lower risk due to less exposure.

S.4.5.6 Steady-State Assumption

All exposure calculations used in this baseline HHRA assume that concentrations of chemicals in the affected media are at steady state (i.e., remain constant for the duration of the exposure period). The steady-state assumption may be appropriate for most inorganics in soil because most inorganic contaminants neither migrate appreciably nor degrade. However, this steady-state assumption is inappropriate for soluble and mobile metals (e.g., arsenic, hexavalent chromium, and nickel) or organics in soil. These chemicals tend to migrate, eventually depleting the source, or may degrade over time. For simplicity, the conservative (health-protective) steady-state assumption was used. Contaminant concentrations in groundwater were assumed to remain constant over the 30-year residential RME exposure duration, which is the maximum exposure duration considered in this baseline HHRA. This extremely conservative assumption probably overestimates exposures to COPCs in groundwater.

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S.4.5.7 Bioavailability

It was conservatively assumed that 100% of contaminants associated with the affected media were bioavailable, except for dermal absorption as specified by Region 6 (EPA 1992e); however, the bioavailability of most chemicals in most media is less than 100%. The bioavailability of a chemical depends on the solubility of the chemical in the stomach, the lungs, and across the skin (for ingestion, inhalation, and dermal exposure, respectively). Other factors that affect bioavailability include the anatomy of the lungs and gastrointestinal tract and the physiological and biochemical processes involved in the absorption, metabolism, and excretion of a substance. Because empirical data on bioavailability for chemicals are insufficient, 100% bioavailability of contaminants was assumed.

S.4.5.8 Perspective on Exposure Assessment Uncertainties

Overall, calculated exposure estimates are conservative. The cumulative effect of all exposure uncertainties most likely will overestimate, rather than underestimate, the true potential exposures.

S.4.6 EXPOSURE TO LEAD

The remainder of Section 4 discusses potential exposure pathways to lead, the IEUBK model, and uncertainties associated with the model. Also presented are the IEUBK model data input, assumptions, and uncertainties.

Thirty-three residences were selected for extensive lead evaluation from the 270 on-site residential structures.[1] Of these, 27 were randomly selected (to represent approximately 10% of the total number of residences) and six were selected based on elevated soil lead concentrations found during the ESI (E & E 1993). Based on the variability of surface soil lead measured by X-ray fluorescence (XRF), the 33 SGRs were found to be statistically representative of all residences at the ASL site. The number of selected residences were proportional to the style of unit (i.e., single-family homes, townhouses, and apartments).

[1]Although the 1990 census identifies 374 residential units on site, SGRs were selected from among 270 residential structures that included both single- and two-story (HANO housing) structures. Buildings with two floors were counted as single structures because outdoor soil contact areas would be identical.

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These SGRs, which range in age from approximately seven to 26 years, consist of 13 single-family homes, 15 townhouses, and five apartments. Based on the results of a two-page questionnaire (Attachment S.E) distributed to the SGRs residents, 138 people, including 60 children, occupy these residences. At least 14 of these children are 6 or younger. A pregnant 21 year old was living in one of the residences at the time sampling was conducted. Residents at 19 homes have lived at their present address for at least 10 years. None of the SGRs have lead plumbing; however, 17 of the homes utilize natural gas.

Five additional residences were evaluated as background. All are single-family homes that range in age from 6 to 42 years. Ten adults and three children live in these homes; two children are younger than 4. All of the background homes utilize natural gas, and two of the homes have lead plumbing.

S.4.6.1 Identification of Exposure Pathways

Because of the lack of empirical evidence for a toxicity threshold for many of the noncancer effects of lead in infants and young children, coupled with the multimedia exposure scenarios, meaningful oral and inhalation reference doses (RFDs) have not been developed for lead. Therefore, lead exposures at the ASL site were assessed using EPA's IEUBK model, version 0.99d (EPA 1994e). The model incorporates exposure and biokinetic algorithms to predict a distribution of blood lead levels in children as a function of the measured lead concentration in several media, including air, soil, dust, water, and food. Site-specific exposure pathways incorporated into the IEUBK model included soil, dust, and drinking water ingestion. These exposure pathways are shown in Figure S.4-3.

S.4.6.1.1 Air

Inhalation of airborne particulates can be evaluated using the IEUBK model. However, exposure by this pathway is not expected to be significant at the ASL site because of extensive vegetation and asphalt and concrete paving. In addition, the humid climate of the area tends to minimize dusty conditions, thereby preventing release and transport of fugitive

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dusts. Consequently, this pathway was not evaluated using site-specific data and model default parameters were used instead, as discussed in Section S.4.6.3.

S.4.6.1.2 Soil and Dust

Children may be exposed to lead through incidental ingestion of lead-contaminated soil and indoor house dust. House dust can become contaminated by outdoor soil or deteriorated lead-based paint. Ingestion of lead-containing soil and dust was considered jointly in the IEUBK model. Although lead-containing soil and dust can adhere to the skin, the potential for significant dermal exposure is believed to be minimal because of the low solubility and skin absorption characteristics of inorganic lead. Consequently, dermal contact with lead-contaminated soil and dust is not an option in the IEUBK model.

S.4.6.1.3 Diet

Lead in food can be derived from several sources, including the soil in which plants are grown, air and rain, food processing (including lead leaching from some types of metal cans), and contact with lead dusts in the home. Children at the ASL site may be exposed to lead through ingestion of homegrown produce. However, lead was not detected at measurable concentrations in the garden vegetable samples collected. Consequently, this pathway was not evaluated using site-specific data and model default parameters were used as discussed in Section S.4.6.3.

S.4.6.1.4 Water

Lead can enter ambient water bodies by atmospheric deposition and surface water runoff. Lead concentrations in drinking water may be higher than ambient levels because of leaching of lead from lead pipes or lead-soldered joints. None of the SGRs at the ASL site were found to have lead-based plumbing. Drinking water is supplied from a public water distribution system (Jaynes 1994). However, exposure to lead through ingestion of drinking water was evaluated using the IEUBK model by collecting tap water at the SGRs because

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ingestion of lead-contaminated drinking water is one of several media that may impact blood lead levels.

S.4.6.2 Integrated Exposure Uptake Biokinetic Model Description

EPA developed the IEUBK model to assess blood lead dose-response relationships in children living in lead-contaminated areas. The model is a four-compartment, first-order kinetic model of lead metabolism, which predicts blood lead levels for children using site-specific, multimedia lead data. The model also predicts the probability of children exposed to lead in that environment that will have a blood lead concentration exceeding a health-based level of concern (EPA 1994e). Currently, the health-based level of concern is a blood lead level of 10 micrograms (μg) of lead per deciliter (dL) of blood, or simply 10 μg/dL (Centers for Disease Control 1991). The four main components of the IEUBK model are shown in Figure S.4-4 and described below:

- An exposure model that relates environmental lead concentrations to age-dependent intake of lead into the gastrointestinal tract;
- An absorption model that relates absorption in the gastrointestinal tract and subsequent lead uptake into the blood;
- A biokinetic model that relates lead concentrations in the blood to lead concentrations in several organ and tissue compartments; and
- A model that considers uncertainty and population variability in absorption and biokinetics (EPA 1994e).

The model assumes a linear relationship between absorbed lead and blood lead at uptake levels ranging from 10 to 100 micrograms of lead per day. This relationship addresses the variability in blood lead levels for children exposed to similar environmental concentrations of lead. The model is designed to evaluate a relatively stable exposure situation in a single residential exposure setting rather than rapidly changing exposures. It cannot be used to predict the effects of acute (short-term) exposure, such as exposure over a few days or weeks. Default values developed by EPA for typical childhood exposure can be used

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whenever site-specific information is unavailable. EPA's test of the model's sensitivity to input parameters revealed that the critical input parameters are dietary lead intake, soil and dust ingestion rate, gastrointestinal absorption of lead, and the variance across exposed individuals in blood lead response in terms of the geometric standard deviation about the mean blood lead level (EPA 1994e).

S.4.6.3 Data Input, Assumptions, and Exposure Parameters

Surface soil, dust, and drinking water samples were collected from each home. In addition, garden vegetable and paint chip samples were obtained when possible. For each of the SGRs, a maximum of five composite surface soil samples were collected, one each from the front yard, back yard, drip line, play area, and/or garden areas. Lead was found on site at concentrations greater than background levels. Each composite sample was prepared by mixing five individual sample aliquots in one (e.g., front yard) sample. Generally, dust samples were collected from the living room and one or two bedrooms; in a few cases, dust samples were collected from the entrance to the residence or from the bathroom. Vegetable samples were collected from two SGRs with gardens. Because sampling occurred in early spring, only two SGRs had gardens. More gardening reportedly occurs in the summer. Paint chip sampling was conducted in conjunction with XRF screening for lead in paint, but due to the uncertainty in incorporating paint chip data into the model, these data were not used as input (see S.4.6.3.4).

S.4.6.3.1 Site-Specific Lead Data for Input to the Integrated Exposure Uptake Biokinetic Model

For evaluations of potential lead exposures with the IEUBK model, EPA recommends using the average or arithmetic mean of soil lead concentrations from a representative area in a child's yard and an average of dust lead concentrations from representative areas frequented by children inside their homes (EPA 1994e). Based on this recommendation, surface soil sample data collected at each SGR were averaged to obtain a single EPC for each household. A similar approach was used to estimate an EPC for dust. For drinking water, results of

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first-draw and 3-minute purge samples were used. The model assumes that 50% of the water ingested by a child is consumed on a first-draw basis; concentrations detected in the first-draw samples were used to evaluate this exposure. Three-minute purge sample data were used to estimate partially flushed samples since these data account for 35% of a child's water consumption. When lead was not detected in an environmental sample, one-half the detection limit was used to calculate EPCs.

S.4.6.3.2 Input Parameters—Study Group Residences

Site-specific exposure parameters were used where available, but in cases where site-specific lead concentrations were unavailable, model default parameters were used (see Table S.4-21). The potential exposure pathways were assessed in the following manner.

Air

As discussed in Section S.4.6.1, ambient air lead concentration was expected to be minimal; thus, the model default value of 0.1 micrograms per cubic meter ($\mu g/m^3$) was used for the inhalation pathway. This value corresponds to the approximate average 1990 urban air lead concentration (EPA 1991e). A constant air concentration lead value of greater than 0.1 $\mu g/m^3$ may be appropriate for assessment at locations near active point sources of lead emissions, such as lead smelters or battery plants (EPA 1994e). However, because the ASL site is not in such an area, the model default value was used.

Other default values also were used in evaluating the air pathway. For example, the model assumes that the indoor air lead concentration is 30% of the outdoor concentration, or 0.03 $\mu g/m^3$. The time spent outdoors and the ventilation rate are assumed to depend on the child's age. The inclusion of these age-dependent exposure parameters allows a time-weighted air lead intake to be calculated; this results in 32% of the intake absorbed through the lungs into blood (EPA 1994e). Additional model default parameters used in the air pathway are presented in Table S.4-21.

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Soil and Dust

Exposure to lead in soil and dust is assessed simultaneously in the IEUBK model. If site-specific dust data are unavailable, the model assumes that 70% of the fraction of the soil lead concentration contributes to the lead concentration in household dust. For the ASL site, site-specific measured lead concentrations were available for soil and dust; consequently, default assumptions regarding the relative contribution of soil lead to dust lead were not used. Age-specific intake factors are based on an EPA/Office of Air Quality Planning and Standards staff paper (EPA 1989f). Dust exposures outside the home (e.g., day care or school) also may contribute to a child's exposure to lead. However, these exposures were not quantified. Table S.4-21 contains a summary of the input parameters used.

Diet

The dietary lead input parameters include intake values for each age group based on the typical American diet and quarterly surveys of lead in this diet. To assess exposures to a typical child at the ASL site, the model was conducted with default intake parameters. In addition to dietary lead intake, children may receive additional lead exposure through ingestion of homegrown vegetables; however, because lead was not positively detected in the vegetable samples collected, ingestion of homegrown produce was not evaluated.

Water

To evaluate the risks associated with ingestion of lead in tap water, the concentrations of lead in first-draw and 3-minute purge samples were input into the model. First-draw samples generally have higher lead concentrations than purged samples. However, since none of the SGRs have lead plumbing, first-draw samples did not have significantly higher lead concentrations than purged samples. The default scenario assumes that 50% of the water ingested by a child is consumed at home as first-draw and was evaluated here using the

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concentration detected in the first-draw samples. The remaining intake consists of partially flushed intake inside the home (35%, evaluated using the 3-minute purge sample results) with the remaining water (15%) consumed outside the home (evaluated using a default concentration of 10 μg/L).

S.4.6.3.3 Input Parameters—Undeveloped Area

The IEUBK model also was used to evaluate risks under a future residential scenario. The results from the surface soil grid sampling in the undeveloped area were used to evaluate the risks associated with ingestion of lead-containing surface soil for hypothetical future residents. Each grid sample location was assumed to represent the lead concentration at a single hypothetical residential dwelling. The model was run using site-specific soil data and default parameters for all other pathways.

S.4.6.3.4 Lead Exposure Assessment Uncertainties

Several uncertainties are associated with evaluating lead risks using the IEUBK model. These uncertainties fall into two categories: those that are inherent in the model and those associated with site-specific parameters.

S.4.6.4 Model Uncertainties

In the absence of site-specific data, model default parameters were used. As suggested in the EPA guidance manual (EPA 1994e), model default parameters were developed to represent a typical child's exposure. Consequently, these parameters may not be appropriate for all exposure scenarios. For example, a pica child's exposure to lead-containing media is significantly different from the exposure received by a typical child (as defined by the model default parameters). Therefore, using default parameters would underestimate lead exposure for a pica child.

A second uncertainty associated with the model is the use of a single geometric standard deviation (GSD). The GSD is used to characterize the combined variability in blood lead levels attributable to differences in individuals; temporal variability in absorption and

biokinetics; behavioral differences affecting ingestion rates; and measurement errors in environmental lead concentrations (EPA 1994e). Because the GSD is not considered a site-specific parameter, it was not adjusted for the ASL site evaluation. However, risk estimates are usually very sensitive to this parameter (EPA 1994e).

A third major uncertainty associated with the IEUBK model is the use of the 10 μg/dL blood lead level as the regulatory benchmark. Human studies have not demonstrated a threshold for lead's toxic effects and; consequently adverse health effects associated with this level are not well understood.

Uncertainties Associated with Site-Specific Data

EPA recommends using average concentrations as the IEUBK model input to evaluate soil and dust ingestion exposures. However, average concentrations may not accurately reflect the exposure that a child would receive because soil concentrations could vary across the exposure area. For example, at one SGR (SG-005), the surface soil samples contained lead at concentrations ranging from 94 to 477 mg/kg. Thus, if a child spends relatively more time in the area with higher lead concentrations, the average concentration would underestimate the child's exposure to lead-containing soil, and vice versa. However, the average value probably represents the overall exposure an individual child would receive at home.

Two other major uncertainties associated with the site-specific data involve the evaluation of lead exposures by diet and paint chips. The diet pathway was evaluated using model default parameters. Because garden produce sampling was conducted in mid- to late-April 1994 (i.e., early in the growing season), only four vegetable samples were collected. Lead was not positively detected in any of these samples. Because vegetable samples were unavailable for every SGR with a garden, it is possible that other residents, whose gardens did not have vegetables at the time of sampling, could be exposed to lead through ingestion of homegrown produce.

Several uncertainties are associated evaluating paint chip data. First, the IEUBK model does not contain an explicit compartment for lead-based paint ingestion. This pathway was evaluated using the Alternate Source Option in the soil/dust menu of the model. Second,

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ingestion of extremely small quantities of paint chips on a single occasion can cause serious lead intoxication because old lead-based paint can contain more than 50% lead (EPA 1994e). However, the IEUBK model is designed to evaluate long-term chronic exposures. As outlined in the IEUBK guidance manual (EPA 1994e), greater uncertainties are associated with the lead-based paint chip pathway than other exposure routes. These uncertainties include:

- The quantity of paint chips ingested on a long-term or chronic basis is unknown; even small quantities of ingested paint can produce a lead intake of millions of micrograms per day, overwhelming all other sources;
- Lead levels associated with paint chips are reported as the concentration detected in the paint chip; this requires making assumptions about the thickness of the paint chip;
- Paint chips may not be completely absorbed in the gastrointestinal tract;
- Lead paint absorption in laboratory animals has been found to depend significantly on particle size and chemical specification of paint particles. Consequently, estimates of lead bioavailability in paint require a more complete site-specific characterization by particle size and chemical specification than do soil; such information was not available for the paint chips collected at the ASL site; and
- The paint chip ingestion rate may be overly conservative because not every child at the ASL site has pica for paint.

Table S.4-1

SUMMARY OF EXAMINED EXPOSURE PATHWAYS
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation	Basis for Selection or Exclusion of Pathway
Current Land Use			
Residents (Children, ages 1 through 6, and Adults)	Incidental ingestion of and dermal contact with surface soil	Yes	COPCs were detected in surface soil throughout the developed area
	Ingestion of homegrown produce	Yes	COPCs were detected in garden vegetables collected at two residences
	Ingestion of and dermal exposures to groundwater on site	No	No residential wells are on site
	Inhalation of vapors while showering	No	No residential wells are on site
	Inhalation of outdoor ambient air	Yes	Certain COPCs are volatile
	Inhalation of indoor ambient air	Yes	Certain COPCs are volatile
	Assessment of exposure to lead	Yes	Previous data have shown elevated lead concentrations (1993 ESI)
Moton Elementary School Students (Children, ages 6 through 12)	Incidental ingestion of and dermal contact with surface soil	Yes	COPCs were detected in surface soil at Moton Elementary School
	Inhalation of outdoor soil gas vapors	Yes	Certain COPCs are volatile; samples were collected outside at Moton Elementary School
	Inhalation of indoor soil gas vapors	Yes	Certain COPCs are volatile; samples were collected inside Moton Elementary School
Press Park Community Center Visitors (Children, ages 6 through 12)	Incidental ingestion of and dermal contact with surface soil	Yes	COPCs were detected in surface soil at Press Park Community Center

Key at end of table.

Table S.4-1

SUMMARY OF EXAMINED EXPOSURE PATHWAYS
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation	Basis for Selection or Exclusion of Pathway
Industrial Workers (Adults)	Incidental ingestion of and dermal contact with surface and subsurface soil	Yes	COPCs were detected in surface and subsurface soils in the developed area
	Inhalation of outdoor soil gas vapors	Yes	Certain COPCs are volatile; samples were collected outside at study group residences
Trespassers (Adults)	Incidental ingestion of and dermal contact with surface soil	Yes	COPCs were detected in surface soil at the undeveloped area, and individuals were observed in this area
	Inhalation of outdoor soil gas vapors	Yes	Certain COPCs are volatile; samples were collected outside at the undeveloped area, and individuals were observed in this area
Future Land Use			
Residents (Children, ages 1 through 6, and Adults)	Incidental ingestion of and dermal contact with surface and subsurface soil	Yes	COPCs were detected in surface and subsurface soil throughout the undeveloped area
	Ingestion of homegrown produce	No	Data unavailable
	Ingestion of and dermal exposures to groundwater on site	Yes	Groundwater assumed for residential use under future land-use conditions
	Inhalation of vapors while showering	Yes	Groundwater is assumed for residential use under future land-use conditions
	Inhalation of outdoor ambient air	Yes	Certain COPCs are volatile; samples were collected outside at the undeveloped area
	Inhalation of indoor ambient air	No	Results would be similar to those for current land-use conditions
	Assessment of exposure to lead	Yes	Data from the undeveloped area were used to assess lead by using the IEUBK model

Key at end of table.

Table S.4-1

SUMMARY OF EXAMINED EXPOSURE PATHWAYS
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation	Basis for Selection or Exclusion of Pathway
Moton Elementary School Students (Children, ages 6 through 12)	Incidental ingestion of and dermal contact with surface and subsurface soil	No	Risks evaluated for future residents and current workers will include the subsurface soil data collected at Moton Elementary School
	Inhalation of outdoor ambient air	No	Results would be similar to those for current land-use conditions
	Inhalation of indoor ambient air	No	Results would be similar to those for current land-use conditions
Press Park Community Center Visitors (Children, ages 6 through 12)	Incidental ingestion of and dermal contact with surface and subsurface soil	No	Only one subsurface soil sample is available for Press Park Community Center; risks associated with this medium were evaluated for future residents and current workers
Industrial Workers (Adults)	Incidental ingestion of and dermal contact with surface and subsurface soil	Yes	COPCs were detected in surface and subsurface soil at the undeveloped area
	Inhalation of outdoor soil gas vapors	Yes	Certain COPCs are volatile; samples were collected outside at the undeveloped area
Trespassers (Adults)	Incidental ingestion of and dermal contact with in surface soil	Yes	COPCs were detected in surface and subsurface soil at the undeveloped area
	Inhalation of outdoor soil gas vapors	Yes	Certain COPCs are volatile; samples were collected outside at the undeveloped area

Key:

COPCs = Chemicals of potential concern.
ESI = Expanded site inspection.
IEUBK = Integrated Exposure Uptake Biokinetic Model.

Source: Ecology and Environment, Inc., 1994.

Table S.4-2

SUMMARY OF COMPLETE CURRENT EXPOSURE PATHWAYS
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Receptor	Exposure Pathway	Exposure Medium	Source of Exposure Point Concentration	Sample Data Used for Calculating Exposure Point Concentration
Current Exposure Scenarios				
Residents (Children and Adults)	Dermal contact and incidental ingestion	Surface soil	95% UCL on the arithmetic mean of the measured concentrations	Developed area grid surface soil samples
	Inhalation of outdoor air	Ambient air (outside residences)	95% UCL on the arithmetic mean of the results approximated by the box model	Summa® gas canisters analyzed for VOCs and methane
	Inhalation of indoor vapors	Ambient air (in residences)	95% UCL on the arithmetic mean of the measured concentrations	Summa® gas canisters analyzed for VOCs and methane
	Ingestion of garden produce	Garden produce	95% UCL on the arithmetic mean or maximum of the measured concentrations	Produce TAL/TCL (except VOCs) concentrations
	Ingestion of lead contaminated media	Multiple	Average measured value or IEUBK model default	Tap water, dust, paint chip, soil, and garden produce samples
Moton Elementary School (Children)	Dermal contact and incidental ingestion	Surface soil	95% UCL on the arithmetic mean or maximum of the measured concentrations	Moton Elementary School surface soil samples
	Inhalation of outdoor soil gas vapors	Ambient air (soil gas vapors)	95% UCL on the arithmetic mean or maximum of the results approximated by the box model	Summa® gas canisters analyzed for VOCs and methane at Moton Elementary School
	Inhalation of indoor vapors	Ambient air (in Moton Elementary School)	95% UCL on the arithmetic mean or maximum of the measured concentrations	Summa® gas canisters analyzed for VOCs and methane at Moton Elementary School
Press Park Community Center (Children)	Dermal contact and incidental ingestion	Surface soil	95% UCL on the arithmetic mean or maximum of the measured concentrations	Press Park Community Center surface soil samples

Key at end of table.

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Table S.4-2

SUMMARY OF COMPLETE CURRENT EXPOSURE PATHWAYS
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Receptor	Exposure Pathway	Exposure Medium	Source of Exposure Point Concentration	Sample Data Used for Calculating Exposure Point Concentration
Workers (Adults)	Dermal contact and incidental ingestion	Surface and subsurface soil	95% UCL on the arithmetic mean of the measured concentrations	Developed area grid surface soil samples and subsurface soil samples (3"-24" and 2'-5') collected at the study group homes, Moton Elementary School, and Press Park Community Center
	Inhalation of outdoor air	Ambient air (outside residence)	95% UCL on the arithmetic mean of the results approximated by the box model	Summa gas canisters analyzed for VOCs and methane
Trespassers (Adults)	Dermal contact and incidental ingestion	Surface soil	95% UCL on the arithmetic mean of the measured concentrations	Undeveloped area surface soil grid samples
	Inhalation of outdoor air	Ambient air (outside residences)	95% UCL on the arithmetic mean or maximum of the results approximated by the box model	Undeveloped area Summa® canister samples
Future Exposure Scenarios				
Residents (Children and Adults)	Dermal contact and incidental ingestion	Surface and subsurface soil	95% UCL on the arithmetic mean of the measured concentrations	Undeveloped area surface soil grid samples and any subsurface data available to a depth of 5 feet
	Ingestion of groundwater	Groundwater	Average concentration from the most contaminated wells	Interior and perimeter well clusters (shallow and deep wells were considered separately)
	Inhalation of vapors and dermal contact while showering	Groundwater	Average volatile concentration from the most contaminated wells	Interior and perimeter well nests (shallow and deep wells were considered separately)
	Inhalation of outdoor air	Ambient air (outside residences)	95% UCL on the arithmetic mean or maximum of the results approximated by the box model	Undeveloped area Summa® gas canisters

Key at end of table.

Table S.4-2

SUMMARY OF COMPLETE CURRENT EXPOSURE PATHWAYS
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Receptor	Exposure Pathway	Exposure Medium	Source of Exposure Point Concentration	Sample Data Used for Calculating Exposure Point Concentration
	Inhalation of indoor vapors[a]	Ambient air	95% UCL on the arithmetic mean of the measured concentrations	Summa® gas canisters analyzed for VOCs and methane
Workers (Adults)	Dermal contact and incidental ingestion	Surface and subsurface soil	95% UCL on the arithmetic mean of the measured concentrations	Undeveloped area surface soil grid samples and any subsurface data available to a depth of 5 feet
	Inhalation of outdoor soil gas vapors	Ambient air	95% UCL on the arithmetic mean or maximum of the results approximated by the box model	Undeveloped area Summa® gas canisters
Trespassers (Adults)	Dermal contact and incidental ingestion	Surface and subsurface soil	95% UCL on the arithmetic mean or maximum of the results approximated by the box model	Undeveloped area surface soil grid samples and subsurface data available to a depth of 5 feet
	Inhalation of outdoor soil gas vapors[a]	Ambient air	95% UCL on the arithmetic mean or maximum of the results approximated by the box model	Undeveloped area Summa® gas canisters

[a] Identical to current scenario results.

Key:

TAL/TCL = Target analyte list/target compound list.
UCL = Upper confidence level.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1994.

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Table S.4-3

RESIDENTIAL SCENARIO—INCIDENTAL INGESTION OF SOIL HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CS \times IR \times CF \times EF \times ED \times FI}{BW \times AT}$$

where:

CS = Chemical concentration in soil (mg/kg)
IR = Ingestion rate (mg soil/day)
CF = Conversion factor (10^{-6} kg/mg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction ingested from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CS	Adult/Child	RME/Average	Exposure point concentration in soil
IR	Adult	RME/Average	100 mg/day (all ages older than 6) (EPA 1989d)
	Child	RME	200 mg/day (children 1-6 years old) (EPA 1989d)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile time at a single residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Adult/Child	RME/Average	1.0 (see text)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligrams.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-4

RESIDENTIAL SCENARIO—DERMAL CONTACT WITH SOIL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Equation:

$$DAD\ (mg/kg\text{-}day) = \frac{DA_{event} \times EF \times ED \times SA}{BW \times AT}$$

where, $DA_{event} = CS \times AF \times ABS$

and

DAD = Dermally absorbed dose (mg/kg-day)
DA_{event} = Dose absorbed per unit area per event
AF = Adherence factor of soil to skin (mg/cm^2-event)
ABS = Absorption factor (unitless)
CS = Chemical concentration in soil (mg/kg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
SA = Skin surface area available for contact (cm^2)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CS	Adult/Child	RME/Average	Exposure point concentration in soil
SA	Adult	RME/Average	5,000 cm^2 (adult average, assumes 25% of skin surface is exposed, 20,000 cm^2 x 0.25) (EPA 1992a)
	Child	RME	1,800 cm^2 (average for ages 2-6 [data unavailable for children younger than 2], assumes 25% of skin surface is exposed, 7,300 cm^2 x 0.25) (EPA 1992a)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
AF	Adult	RME	1 mg/cm^2-event (maximum default value) (EPA 1992a)
		Average	0.2 mg/cm^2-event (minimum default value) (EPA 1992a)
	Child	RME	1 mg/cm^2-event (maximum default value) (EPA 1992a)
ABS	Adult/Child	RME/Average	Chemical-specific value
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile time at a single residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key at end of table.

Key:

cm^2 = Square centimeter.
EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligrams.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-5

RESIDENTIAL SCENARIO—INGESTION OF GARDEN PRODUCE HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CP \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CP = Chemical concentration in garden produce (mg/kg)
IR = Ingestion rate (kg/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction of contaminated produce ingested (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CP	Adult/Child	RME/Average	Exposure point concentration in garden produce
IR	Adult	RME/Average	0.080 kg/day (EPA 1992e)
	Child	RME	0.040 kg/day (EPA 1992e)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile duration at a single residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Adult/Child	RME	0.4 (worst case) (EPA 1989b)
	Adult/Child	Average	0.25 (average) (EPA 1989b)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-6

RESIDENTIAL SCENARIO—INHALATION OF INDOOR AIR VAPORS HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CA = Chemical concentration in air (mg/m^3)
IR = Inhalation rate (m^3/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction inhaled from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CA	Adult/Child	RME/Average	Measured concentration in air
IR	Adult	RME/Average	15 m^3/day (as cited in EPA 1992e; 14 m^3/day was recommended for light activity in EPA 1989a)
	Child	RME	5 m^3/day (as cited in EPA 1992c)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile time at one residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Adult/Child	RME/Average	1.0 (see text)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
m^3 = Cubic meters.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-7

RESIDENTIAL SCENARIO—INHALATION OF OUTDOOR VAPORS HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CA = Chemical concentration in air (mg/m^3)
IR = Inhalation rate (m^3/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction inhaled from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CA	Adult/Child	RME/Average	Modeled from soil gas emission measurements
IR	Adult	RME/Average	20 m^3/day (average, assumes 16 hours light activity and 8 hours of resting) (EPA 1989a)
	Child	RME	5 m^3/day (as cited in EPA 1992c)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile time at one residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Adult/Child	RME/Average	1.0 (see text)
BW	Adult	RME/Average	70 kg (average adult body weight; EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
m^3 = Cubic meter.
mg = Milligram.
RME = Reasonable maximum exposure

Source: Ecology and Environment, Inc., 1994.

Table S.4-8

RESIDENTIAL SCENARIO—INGESTION OF GROUNDWATER HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CW \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CW = Chemical concentration in groundwater (mg/L)
IR = Ingestion rate (L groundwater/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction ingested from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CW	Adult/Child	RME/Average	Exposure point concentration in groundwater
IR	Adult	RME	2 L/day (90th percentile) (EPA 1989a, 1991b)
		Average	1.4 L/day (average) (EPA 1989a)
	Child	RME	1 L/day (average as cited in EPA 1989a; reasonable maximum as cited in EPA 1992c)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile time at one residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Adult/Child	RME/Average	1.0 (see text)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
L = Liter.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-9

RESIDENTIAL SCENARIO—DERMAL CONTACT WITH GROUNDWATER HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$DAD\ (mg/kg\text{-}day) = \frac{CW \times PC \times SA \times ET \times EF \times ED \times CF \times FC}{BW \times AT}$$

where:

DAD = Dermally absorbed dose (mg/kg-day)
CW = Chemical concentration in water (mg/L)
PC = Chemical-specific dermal permeability constant (cm/hour)
SA = Skin surface area available for contact (cm^2)
ET = Exposure time (hours/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
CF = Volumetric conversion factor for water (1 L/1,000 cm^3)
FC = Fraction contacted from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CW	Adult/Child	RME/Average	Exposure point concentration in groundwater
PC	Adult/Child	RME/Average	Chemical-specific value (EPA 1992a)
SA	Adult	RME/Average	20,000 cm^2 (Adult average) (EPA 1992a)
	Child	RME	7,300 cm^2 (Average for ages 2-6 [data unavailable for children younger than 2]) (EPA 1992a)
ET	Adult/Child	RME	0.25 hour/day (15 minutes bathing/day) (EPA 1989a)
		Average	0.17 hour/day (10 minutes bathing/day) (EPA 1989a)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile duration at a single residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FC	Adult/Child	RME/Average	1.0 (see text)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key at end of table.

Key:

EPA = United States Environmental Protection Agency.
cm^2 = Square centimeters.
kg = Kilogram.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

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Table S.4-10

RESIDENTIAL SCENARIO—INHALATION OF VAPORS WHILE SHOWERING
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CW \times IR \times ET \times EF \times ED \times FI \times K}{BW \times AT}$$

where:

CW = Chemical concentration in water (mg/L)
IR = Inhalation rate (m^3/hour)
ET = Exposure time (hours/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction inhaled from contaminated source (unitless)
K = Volatilization factor (L/m^3)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CW	Adult/Child	RME/Average	Measured concentration in water
IR	Adult	RME/Average	0.83 m^3/hour (derived from 20 m^3/day divided by 24 hours as cited in EPA 1992e)
	Child	RME	0.21 m^3/hour (derived from 5 m^3/day divided by 24 hours as cited in EPA 1992c)
ET	Adult/Child	RME	0.25 hour/hour (15 minutes bathing/day) (EPA 1989a)
		Average	0.17 hour/day (10 minutes bathing/day) (EPA 1989a)
EF	Adult/Child	RME/Average	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Adult	RME	24 years (90th percentile time at one residence minus 6 years for childhood exposure) (EPA 1989a, 1991b)
		Average	9 years (50th percentile time at one residence) (EPA 1989a)
	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Adult/Child	RME/Average	1.0 (see text)
K	Adult/Child	RME/Average	0.5 L/m^3 (Andelman 1990)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
	Child	RME	16 kg (average for 1- to 6-year-old age group) (EPA 1989b)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key at end of table.

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
L = Liter.
m^3 = Cubic meter.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-11

MOTON ELEMENTARY SCHOOL AND PRESS PARK COMMUNITY CENTER SCENARIO—INCIDENTAL INGESTION OF SOIL HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CS \times IR \times CF \times EF \times ED \times FI}{BW \times AT}$$

where:

CS = Chemical concentration in soil (mg/kg)
IR = Ingestion rate (mg soil/day)
CF = Conversion factor (10^{-6} kg/mg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction ingested from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor[a]	Case	Value (Rationale/Source)
CS	Child	RME	Exposure point concentration in soil
IR	Child	RME	100 mg/day (all ages older than 6) (EPA 1989d)
EF	Child	RME	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Child	RME	1.0 (see text)
BW	Child	RME	30 kg (average for 6- to 12-year-old age group) (EPA 1989a)
AT	Child	RME	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

[a] Six to 12 years old.

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-12

MOTON ELEMENTARY SCHOOL AND PRESS PARK COMMUNITY CENTER SCENARIO—DERMAL CONTACT WITH SOIL HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$DAD\ (mg/kg\text{-}day) = \frac{DA_{event} \times EF \times ED \times SA}{BW \times AT}$$

where, $DA_{event} = CS \times AF \times ABS$

and

DAD = Dermally absorbed dose (mg/kg-day)
DA_{event} = Dose absorbed per unit area per event
AF = Adherence factor of soil to skin (mg/cm^2-event)
ABS = Absorption factor (unitless)
CS = Chemical concentration in soil (mg/kg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
SA = Skin surface area available for contact (cm^2)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor[a]	Case	Value (Rationale/Source)
CS	Child	RME	Exposure point concentration in soil
SA	Child	RME	2,620 cm^2 (average [ages 6 to 12 years], assumes 25% of skin surface is exposed, 10,500 cm^2 × 0.25) (EPA 1992a)
EF	Child	RME	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
AF	Child	RME	1 mg/cm^2-event (maximum default value) (EPA 1992a)
ABS	Child	RME	Chemical-specific value
ED	Child	RME	6 years (entire duration of age group) (EPA 1991b)
BW	Child	RME	30 kg (average for 6- to 12-year-old age group) (EPA 1989a)
AT	Adult/Child	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

[a] Six to 12 years old.

Key:

cm^2 = Square centimeters.
EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-13

MOTON ELEMENTARY SCHOOL SCENARIO-INHALATION OF INDOOR AIR VAPORS HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CA = Chemical concentration in air (mg/m^3)
IR = Inhalation rate (m^3/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction inhaled from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor[a]	Case	Value (Rationale/Source)
CA	Child	RME	Measured concentration in air
IR	Child	RME	17 m^3/day (average ages 6-12, assumes 16 hours light activity and 8 hours of resting) (EPA 1989a)
EF	Child	RME	180 days/year (assumes 36 weeks of school × 5 days/week; best professional judgment)
ED	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Child	RME	1.0 (see text)
BW	Child	RME	30 kg (average for 6- to 12-year-old age group) (EPA 1989a)
AT	Child	RME	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Note: Six to 12 years old.

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
m^3 = Cubic meter.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-14

MOTON ELEMENTARY SCHOOL AND PRESS PARK COMMUNITY CENTER SCENARIO—INHALATION OF OUTDOOR VAPORS HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CA = Chemical concentration in air (mg/m^3)
IR = Inhalation rate (m^3/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction inhaled from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor[a]	Case	Value (Rationale/Source)
CA	Child	RME	Modeled from soil gas emission measurements
IR	Child	RME	17 m^3/day (average, assumes 16 hours light activity and 8 hours of resting) (EPA 1989a)
EF	Child	RME	350 days/year (assumes 2 weeks of vacation/year) (EPA 1991b)
ED	Child	RME	6 years (entire duration of age group) (EPA 1991b)
FI	Child	RME	1.0 (see text)
BW	Child	RME	30 kg (average for 6- to 12-year-old age group) (EPA 1989b)
AT	Child	RME	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

[a] Six to 12 years old.

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
m^3 = Cubic meter.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

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Table S.4-15

INDUSTRIAL SCENARIO—INCIDENTAL INGESTION OF SOIL HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CS \times IR \times CF \times EF \times ED \times FI}{BW \times AT}$$

where:

CS = Chemical concentration in soil (mg/kg)
IR = Ingestion rate (mg soil/day)
CF = Conversion factor (10^{-6} kg/mg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction ingested from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CS	Adult	RME/Average	Measured concentration in soil
IR	Adult	RME/Average	50 mg/day (assumes half of daily exposure occurs at work) (EPA 1989d)
EF	Adult	RME	250 days/year (5 days/week, 50 weeks/year) (EPA 1991b)
		Average	40 events/year (EPA 1992a)
ED	Adult	RME	25 years (95th percentile amount of time working at a single location) (EPA 1991b)
		Average	9 years (same as residential) (EPA 1989a)
FI	Adult	RME/Average	1.0 (see text)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
AT	Adult	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-16

INDUSTRIAL SCENARIO—DERMAL CONTACT WITH SOIL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Equation:

$$DAD\ (mg/kg\text{-}day) = DA_{event} \times \frac{EF \times ED \times SA}{BW \times AT}$$

where, $DA_{event} = CS \times AF \times ABS$

and

DAD = Dermally absorbed dose (mg/kg-day)
DA_{event} = Dose absorbed per unit area per event
AF = Adherence factor of soil to skin (mg/cm^2-event)
ABS = Absorption factor (unitless)
CS = Chemical concentration in soil (mg/kg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
SA = Skin surface area available for contact (cm^2)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CS	Adult	RME/Average	Exposure point concentration in soil
SA	Adult	RME/Average	5,000 cm^2 (adult average, assumes 25% of skin surface is exposed, 20,000 cm^2 × 0.25) (EPA 1992a)
EF	Adult	RME	250 events/year (5 days/week, 50 weeks/year) (EPA 1991b)
		Average	40 events/year (EPA 1992a)
AF	Adult	RME	1 mg/cm^2-event (maximum default value) (EPA 1992a)
		Average	0.2 mg/cm^2-event (minimum default value) (EPA 1992a)
ABS	Adult	RME/Average	Chemical-specific value
ED	Adult	RME	25 years (95th percentile amount of time working at a single location) (EPA 1991b)
		Average	9 years (same as residential) (EPA 1989a)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
AT	Adult	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

cm^2 = Square centimeters.
EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligrams.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994

Table S.4-17

INDUSTRIAL SCENARIO—INHALATION OF OUTDOOR AIR VAPORS HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CA = Chemical concentration in air (mg/m^3)
IR = Inhalation rate (m^3/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction inhaled from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CA	Adult	RME/Average	Measured air concentrations
IR	Adult	RME/Average	20 m^3/day (average, assumes 16 hours light activity and 8 hours of resting) (EPA 1991b)
EF	Adult	RME/Average	250 days/year (5 days/week, 50 weeks/year) (EPA 1991b)
ED	Adult	RME	25 years (95th percentile amount of time working at a single location) (EPA 1991b)
FI	Adult	RME/Average	1.0 (see text)
BW	Adult	RME/Average	70 kg (average adult body weight) (EPA 1991b)
AT	Adult	RME/Average	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
m^3 = Cubic meter.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-18

TRESPASSER SCENARIO—INCIDENTAL INGESTION OF SOIL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CS \times IR \times CF \times EF \times ED \times FI}{BW \times AT}$$

where:

CS = Chemical concentration in soil (mg/kg)
IR = Ingestion rate (mg soil/day)
CF = Conversion factor (10^{-6} kg/mg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction ingested from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CS	Adult	RME	Exposure point concentration in soil
IR	Adult	RME	100 mg/day (all ages older than 6) (EPA 1989d)
EF	Adult	RME	180 days/year (best professional judgment; see text)
ED	Adult	RME	10 years (entire duration of age group) (EPA 1992e)
FI	Adult	RME	1.0 (see text)
BW	Adult	RME	70 kg (average adult body weight) (EPA 1991b)
AT	Adult	RME	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

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Table S.4-19

TRESPASSER SCENARIO—DERMAL CONTACT WITH SOIL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Equation:

$$DAD\ (mg/kg\text{-}day) = \frac{DA_{event} \times EF \times ED \times SA}{BW \times AT}$$

where, $DA_{event} = CS \times AF \times ABS$

and

DAD = Dermally absorbed dose (mg/kg-day)
DA_{event} = Dose absorbed per unit area per event
AF = Adherence factor of soil to skin (mg/cm^2-event)
ABS = Absorption factor (unitless)
CS = Chemical concentration in soil (mg/kg)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
SA = Skin surface area available for contact (cm^2)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CS	Adult	RME	Exposure point concentration in soil
SA	Adult	RME	5,000 cm^2 (adult average, assumes 25% of skin surface is exposed, 20,000 cm^2 × 0.25) (EPA 1992e)
EF	Adult	RME	180 days/year (best professional judgment; see text)
AF	Adult	RME	1 mg/cm^2-event (maximum default value) (EPA 1992a)
ABS	Adult	RME	Chemical-specific value
ED	Adult	RME	10 years (entire duration of age group) (EPA 1992e)
BW	Adult	RME	70 kg (average adult body weight) (EPA 1991b)
AT	Adult	RME	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

cm^2 = Square centimeters.
EPA = United States Environmental Protection Agency.
kg = Kilogram.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

Table S.4-20

TRESPASSER SCENARIO—INHALATION OF OUTDOOR SOIL GAS VAPORS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Equation:

$$Intake\ (mg/kg\text{-}day) = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where:

CA = Chemical concentration in air (mg/m^3)
IR = Inhalation rate (m^3/hour)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
FI = Fraction inhaled from contaminated source (unitless)
BW = Body weight (kg)
AT = Averaging time (days)

Variable	Receptor	Case	Value (Rationale/Source)
CA	Adult	RME	Measured air concentrations
IR	Adult	RME	20 m^3/day (EPA 1991b)
EF	Adult	RME	180 days/year (best professional judgment; see text)
ED	Adult	RME	10 years (entire duration of age group) (EPA 1992e)
FI	Adult	RME	1.0 (see text)
BW	Adult	RME	70 kg (average adult body weight) (EPA 1991b)
AT	Adult	RME	Pathway-specific period of exposure for noncarcinogenic effects (i.e., ED × 365 days/year) and 70-year lifetime for carcinogenic effects (i.e., 70 years × 365 days/year) (EPA 1989b)

Key:

EPA = United States Environmental Protection Agency.
kg = Kilogram.
m^3 = Cubic meter.
mg = Milligram.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc. 1994.

Table S.4-21

INPUT PARAMETERS FOR THE IEUBK MODEL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Parameter	Value
General Model Default Parameters	
Geometric Standard Deviation	1.6
Media-Specific Parameters	
Air	
Outdoor air lead concentration (µg/m^3)	0.1
Indoor air lead concentration (µg/m^3)	0.03
Time spent outdoors (hours/day)	Age-dependent
Ventilation rate (m^3/day)	Age-dependent
Respiratory absorption (%)	32
Lead intake from air (µg/day)	Age-dependent
Diet	
Lead intake from diet (µg/day)	Age-dependent
Lead concentration in homegrown produce [a] (µg/g)	0.135
Total consumed, homegrown (%)	25
Gastrointestinal absorption (%)	50
Water	
Drinking water intake (L/day)	Age-dependent
Total consumed as first draw (%)	50
Concentration of lead in first draw [a] (µg/L)	1.5 - 17
Total consumed as purged (%)	35
Concentration of lead in purged [a] (µg/L)	1.5 - 7.6
Percent of total consumed from fountains (%)	15
Concentration of lead in fountain (µg/L)	10
Lead intake from drinking water (µg/day)	Age-dependent
Gastrointestinal absorption (%)	50
Soil and Dust	
Outdoor soil lead [a] (µg/g)	6.4 - 1,046
Indoor dust lead [a] (µg/g)	2.8 - 876
Weighting factors	45/55 [b]
Fraction passive/total accessible	0.2
Lead intake from dust and soil (µg/day)	Age-dependent
Gastrointestinal absorption (%)	30

(a) Range is based on site-specific data.
(b) Ratio of soil intake to dust intake.

Key:

g = grams
IEUBK = United States Environmental Protection Agency, Integrated Exposure Uptake Biokinetic Model
L = liter
m^3 = cubic meters
µg = micrograms

Source: Ecology and Environment, Inc., 1994

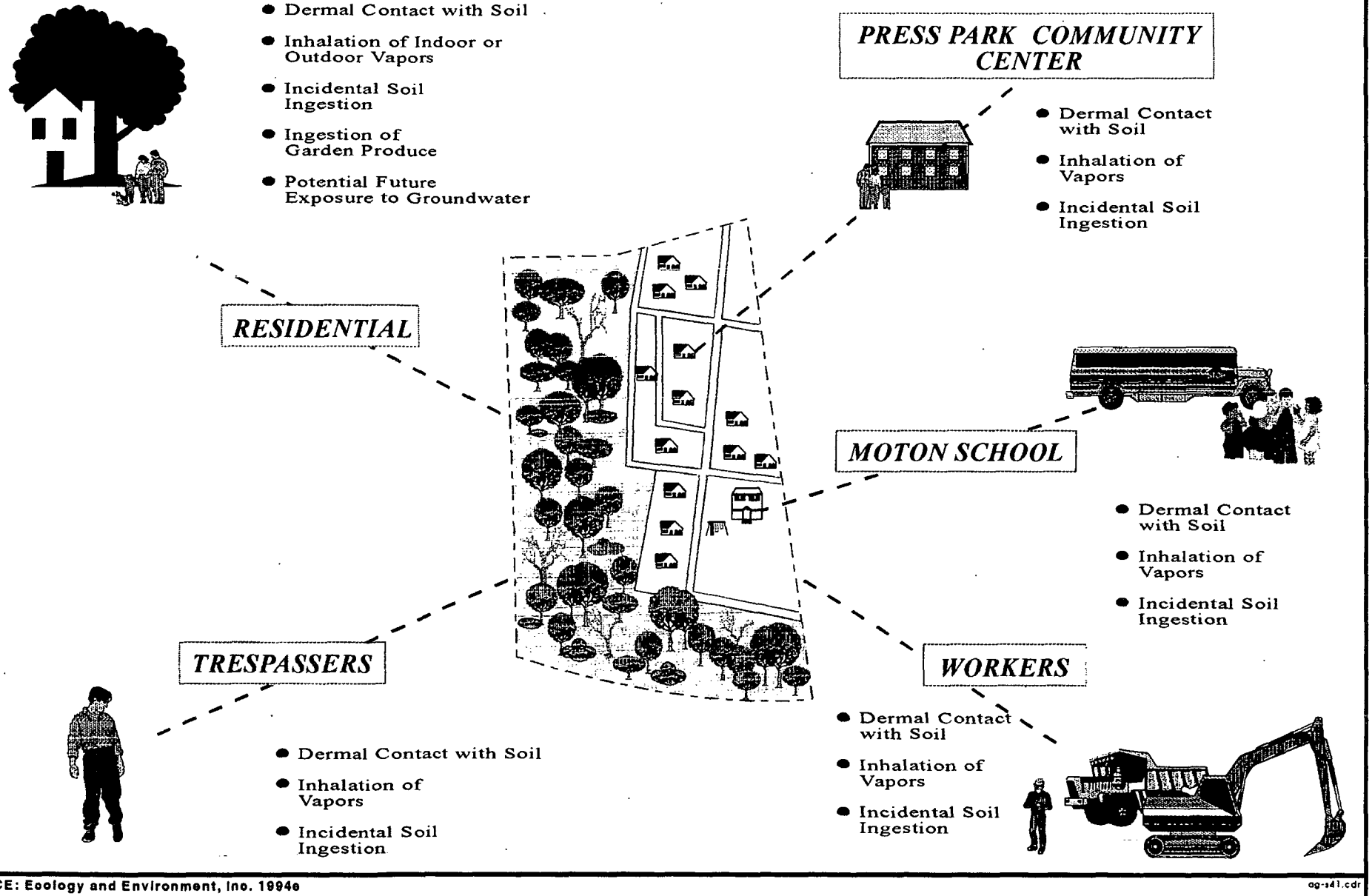

Figure S.4-1 GENERAL SITE MODEL
AGRICULTURE STREET LANDFILL SITE, NEW ORLEANS, LOUISIANA

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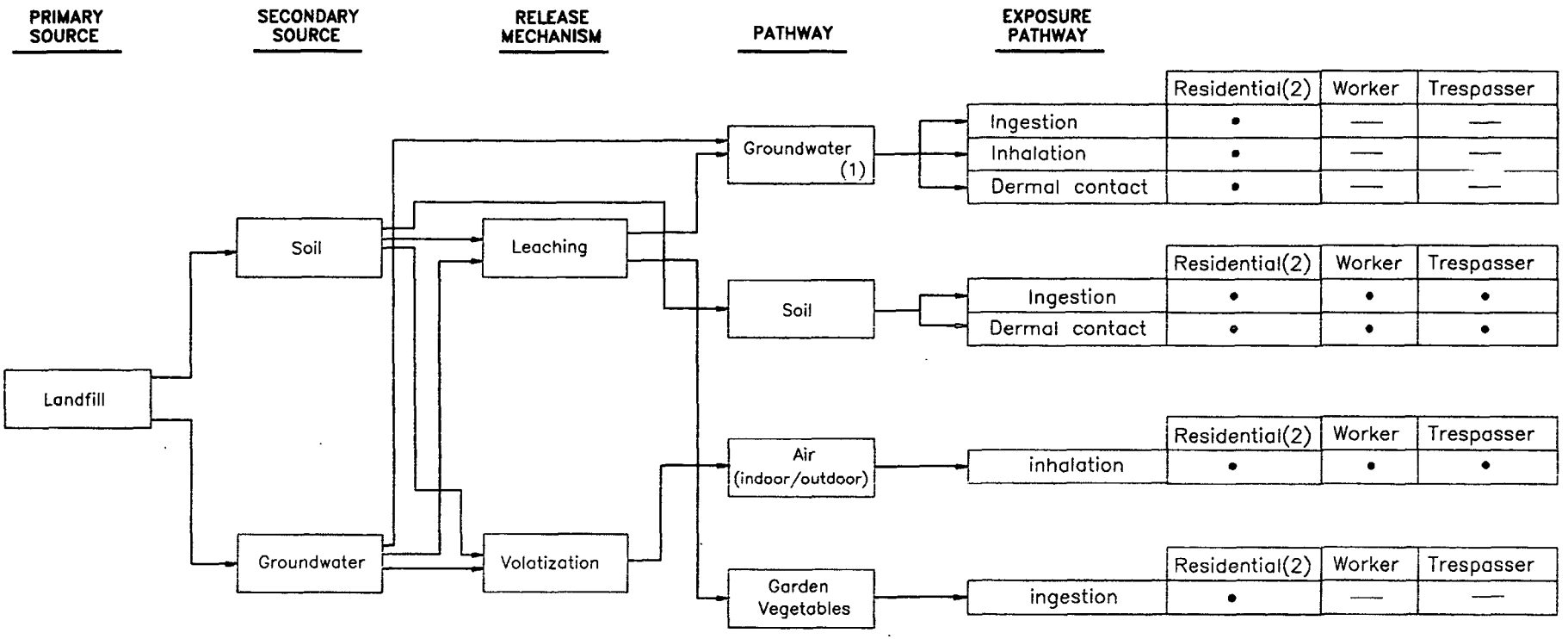


Notes:

(1) Only future exposure will be evaluated for these pathways.

(2) Includes Moton Elementary School and Press Park Community Center.

Key:

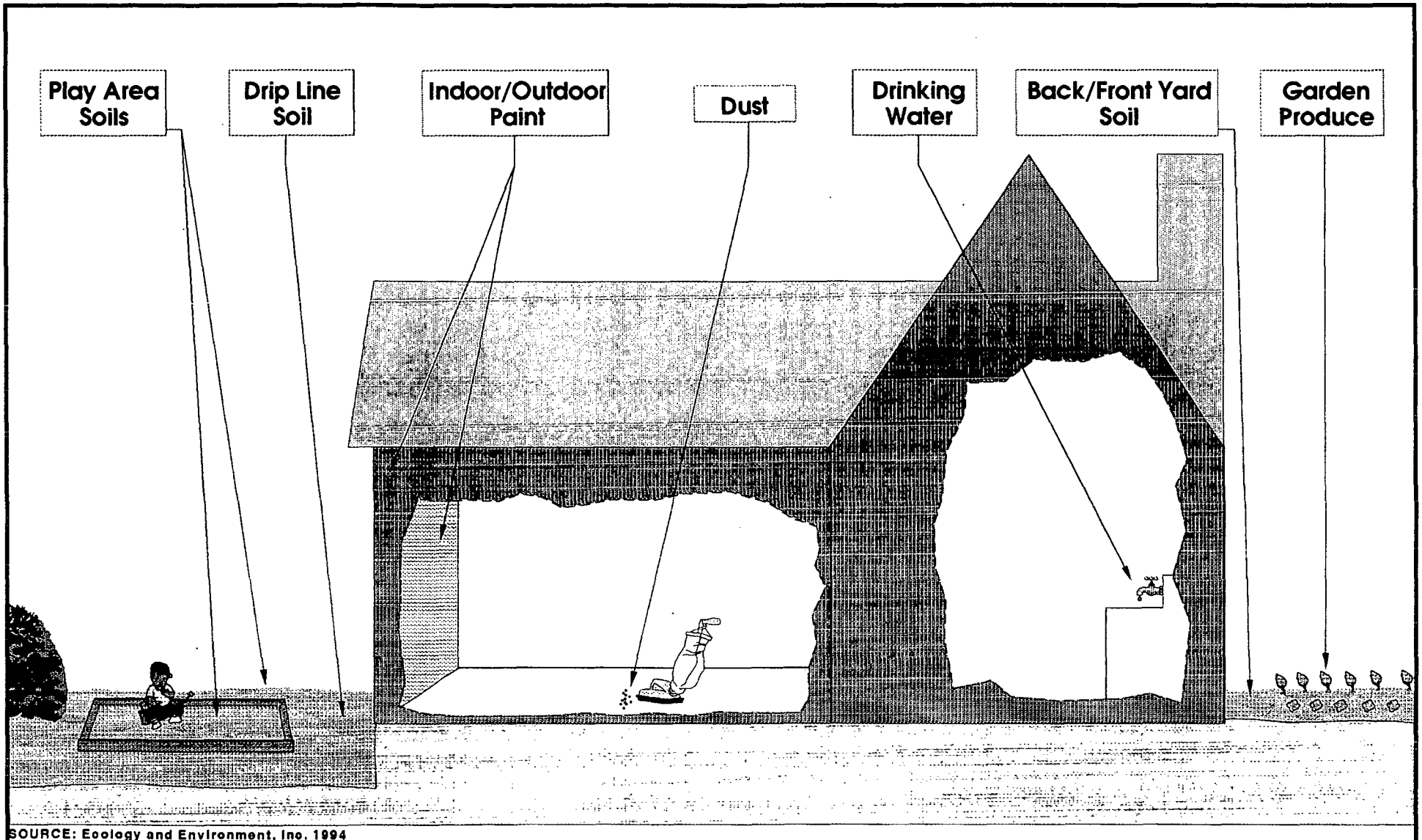
— not evaluated

• evaluated

Source: Ecology and Environment, Inc., 1994.

fig8-42a.dwg

Figure S.4-2 CONCEPTUAL SITE MODEL FOR THE BASELINE HUMAN HEALTH RISK ASSESSMENT AT THE AGRICULTURE STREET LANDFILL SITE



SOURCE: Ecology and Environment, Inc. 1994

Figure S.4-3 LEAD INTEGRATED EXPOSURE UPTAKE BIOKENETICS MODEL INTAKE PATHWAYS AGRICULTURE STREET LANDFILL SITE, NEW ORLEANS, LOUISIANA

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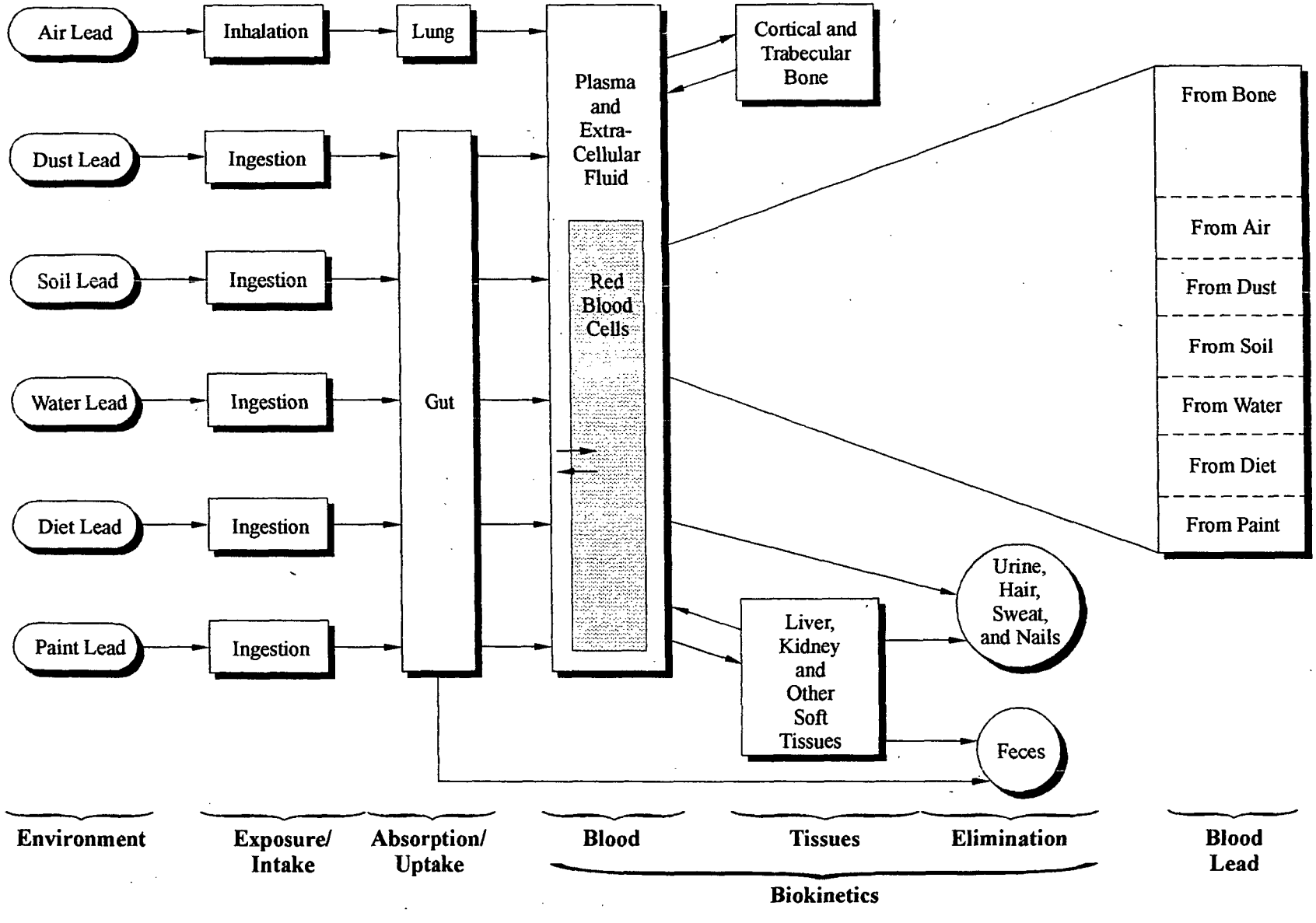
001160.0618



SOURCE: Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, Environmental Protection Agency, 1994e.

Figure S.4-4 COMPONENTS OF THE INTEGRATED EXPOSURE UPTAKE BIOKENETIC MODEL AGRICULTURE STREET LANDFILL SITE, NEW ORLEANS, LOUISIANA

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S.5 TOXICITY ASSESSMENT

The purpose of the toxicity assessment is to compile toxicity information for COPCs and to estimate the relationship between extent of exposure to a contaminant (i.e., the dose level) and likelihood or severity of adverse health effects. This dose-response relationship provides the scientific basis for deriving the toxicity values (i.e., slope factors and RfDs used in the baseline HHRA.

Qualitative descriptions of the potential toxic properties of the COPCs at the ASL site are presented in Attachment S.D. Toxicity values for each COPC are presented in Section S.5.1. Uncertainties in the toxicity assessment process are discussed in Section S.5.2.

S.5.1 TOXICITY VALUES

Toxicity values were compiled to estimate the relationship between the extent of exposure to a contaminant and likelihood or severity of adverse health effects. Methods for deriving toxicity values and estimating potential adverse health effects are presented below. Toxicity values for COPCs evaluated in this baseline HHRA are presented in this section.

The following EPA sources were used to obtain toxicity values:

- The Integrated Risk Information System (IRIS) computer database (EPA 1994b). This is the preferred source of toxicity values because these data are the most recent EPA criteria available and have been reviewed extensively by EPA; and

- The Health Effects Assessment Summary Tables (HEAST) (EPA 1994c). These tables were consulted if a toxicity value was unavailable on IRIS (EPA 1994b). EPA's Environmental Criteria and Assessment Office established these values for use in risk assessments.

S.5.1.1 Categorization of Chemicals as Carcinogens or Noncarcinogens

Carcinogenic and noncarcinogenic health effects were evaluated quantitatively in this baseline HHRA. Endpoints for these two different types of effect are assessed differently because the mechanism(s) by which chemicals cause cancer is fundamentally different from the process(es) by which noncarcinogenic effects are caused. The principal difference reflects the assumption that noncancer effects are assumed to exhibit a threshold dose below which no adverse effects occur, whereas no such threshold has been proven to exist for carcinogenic effects.

As used in this baseline HHRA, the term *carcinogen* refers to any chemical for which there is sufficient evidence that exposure may result in continuing uncontrolled cell division (i.e., cancer) in humans or animals. Conversely, the term *noncarcinogen* refers to any chemical for which the carcinogenic evidence is negative or insufficient. These definitions are under constant review by EPA and are subject to change as new information becomes available and the weight-of-evidence is modified. Because exposure to some chemicals may result in carcinogenic and noncarcinogenic effects, both endpoints associated with a COPC were evaluated quantitatively in the baseline HHRA.

The likelihood that an agent is a human carcinogen is specified by EPA's weight-of-evidence classification (EPA 1986). Data derived from human and animal studies are reviewed and characterized as sufficient, limited, inadequate, no data, or evidence of no effect. The weight-of-evidence classifications are presented in Table S.5-1.

S.5.1.2 Assessment of Carcinogens

In contrast to noncarcinogenic effects, for which thresholds are thought to exist, thresholds have not been demonstrated for carcinogenic effects. Consequently, federal regulatory agencies (i.e., EPA, the Food and Drug Administration, and the Occupational

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Safety and Health Administration) assume that any exposure to a carcinogen entails some finite risk of cancer. However, depending on the potency of a specific carcinogen and level of exposure, such a risk could be infinitesimal.

Several mathematical models were developed to estimate low-dose carcinogenic risks from high-dose cancer bioassays. Consistent with current theories of carcinogenesis, EPA selected the linearized multistage model to estimate toxicity values. In this model, EPA uses the 95% UCL of the slope of the dose-response curve to estimate slope factors. Using these procedures, the regulatory agencies are unlikely to underestimate the actual slope factors (formerly termed *carcinogenic potency factors*) for humans. Slope factors usually are expressed as the inverse of the daily dose per unit body weight ($[mg/kg\text{-}day]^{-1}$). However, toxicity values for carcinogenic effects sometimes are expressed in terms of risk-per-unit concentration of the substance in the medium where human contact occurs. Inhalation slope factors are derived from unit risks (expressed as $[\mu g/m^3]^{-1}$) by assuming a body weight of 70 kilograms (kg) and an inhalation rate of 20 cubic meters per day (m^3/day). Oral slope factors may be derived from unit risks by assuming a 70 kg body weight and a water ingestion rate of 2 liters per day (L/day). Where an absorption fraction of less than 1.0 was applied in deriving the unit risk, an additional conversion factor is necessary so that the slope factor will be based on an administered dose. The standardized duration assumption for slope factors is continuous lifetime exposure. Hence, when no absorption conversion is required:

$$\text{Inhalation Slope Factor}_{(mg/kg\text{-}day)^{-1}} = \frac{\text{Air Unit Risk } (\mu g/m^3)^{-1} \times 70 \text{ kg} \times 10^3 \ \mu g/mg}{20 \ m^3/day}$$

$$\text{Oral Slope Factor}_{(mg/kg\text{-}day)^{-1}} = \frac{\text{Water Unit Risk } (\mu g/L)^{-1} \times 70 \text{ kg} \times 10^3 \ \mu g/mg}{2 \ L/day}$$

Oral and inhalation slope factors for the COPCs are presented in Table S.5-2. This table presents the toxicity criteria for the COPCs evaluated in Section S.4. EPA's weight-of-evidence classification for the chemical and the type of cancer that may be associated with exposure to the chemical also are in Table S.5-2. The derivation of dermal slope factors is discussed in Section S.5.1.4.

S.5.1.3 Assessment of Noncarcinogens

The potential for adverse health effects associated with noncarcinogens (i.e., organ damage, immunological effects, birth defects, and skin irritation) usually is assessed by comparing the estimated average exposure dose to the RfD. EPA develops the RfD by identifying the no-observed-adverse-effect level (NOAEL) or lowest-observed-adverse-effect level (LOAEL) in scientific literature. NOAELs and LOAELs are derived from either human epidemiological studies or animal studies; however, because human data often are lacking, they usually are derived from laboratory animal studies in which relatively high doses are administered. Uncertainty factors (UFs) are applied to the NOAELs and LOAELs to compensate for the data limitations inherent in studies and for the uncertainties associated with using animal data to derive a toxicity value protective of humans. Uncertainty factors are applied to NOAELs and LOAELs as follows (EPA 1989b):

- A UF of 10 is used to account for variation in the general population. This factor is intended to protect sensitive subpopulations (i.e., the elderly and children);
- A UF of 10 is used when extrapolating data from animals to humans. This factor is intended to account for the interspecies variability between humans and other mammals;
- A UF of 10 is used when a NOAEL is derived from a subchronic, rather than a chronic, study; and
- A UF of 10 is used when a LOAEL is used instead of a NOAEL. This factor is intended to account for the uncertainty associated with extrapolating data from LOAELs to NOAELs.

In addition to the UFs listed above, a modifying factor (MF) is applied:

- An MF ranging from 1 to 10 is included to reflect a qualitative professional assessment of additional uncertainties in the critical study and in the entire database. The default value for the MF is 1.

To calculate the RfD, the appropriate NOAEL (or the LOAEL if a suitable NOAEL is unavailable) is divided by the product of all of the applicable uncertainty factors and the modifying factor:

$$RfD = NOAEL \text{ or } LOAEL/(UF_1 \times UF_2 \ldots \times MF)$$

Oral RfDs typically are expressed in units of mg/kg-day. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of the daily intake to humans (including sensitive subgroups), which should not result in an appreciable risk of deleterious effects. EPA assigns a qualitative level of confidence (i.e., low, medium, or high) to the critical study used to derive the toxicity value, the database, and the RfD. The relative degree of uncertainty associated with the RfDs and the level of confidence that EPA assigns to the data and the toxicity value are considered when evaluating the quantitative results of the baseline HHRA.

RfDs are developed for specific exposure routes (i.e., oral, dermal, and inhalation). EPA frequently provides noncancer toxicity criteria for inhalation exposure as reference concentrations (RfCs). RfCs are derived by the same principles as those for the oral RfD. However, the analysis of inhalation exposures is more complex because of the dynamics of the respiratory system and its diversity across species and differences in the physicochemical properties of contaminants (EPA 1989b). The RfC value is reported as a concentration in air (mg/m^3) for continuous, 24-hour-per-day exposure. However, for risk assessment purposes, the RfC must be converted to a corresponding inhalation RfD (RfD_i). A human adult body weight of 70 kg and an inhalation rate of 20 m^3/day are used to convert between an inhaled intake and a concentration in air:

$$RfD_i \text{ (mg/kg-day)} = RfC \text{ (mg/m}^3\text{)} \times 20 \text{ (m}^3\text{/day)} \times 1/70 \text{ (kg)}$$

RfDs are derived for chronic and subchronic exposures; EPA defines *chronic* as seven years or longer and *subchronic* as two weeks to seven years (EPA 1989b). In this baseline HHRA, chronic RfDs were employed to evaluate potential adult noncancer risks.

Subchronic RfDs were used to evaluate risks to children in residential scenarios and children who attend Moton School and utilize Press Park Community Center.

RfDs are used as reference points for assessing the potential adverse health effects associated with site-related exposures. Usually, adverse health effects are unlikely to be associated with exposures that are less than the RfD; the likelihood of adverse health effects in a human population increases if the predicted exposures exceed the RfD. However, it is not possible to state definitively that all exposures below the RfD are acceptable (risk-free) and that all exposures above the RfD are unacceptable (causing adverse effects).

RfDs for the oral and inhalation exposure routes are presented in Table S.5-3. This table presents RfDs for the COPCs evaluated in Section S.4 . The derivation of dermal RfDs is discussed in Section S.5.1.4.

S.5.1.4 Route-to-Route Extrapolation of Reference Doses and Slope Factors, Oral-to-Dermal Extrapolation

Because EPA has not promulgated dermal route RfDs and slope factors, oral route RfDs and slope factors are modified to evaluate exposures to substances by the dermal route. Such route-to-route extrapolation has a scientific basis because once a chemical is absorbed, its distribution, metabolism, and elimination patterns (biokinetics) are usually similar, regardless of the exposure route. However, this approach is inappropriate if the adverse health effect occurs at the point of exposure. For example, the oral RfD for copper is based on gastrointestinal tract irritation; therefore, dermal route RfDs for copper cannot be extrapolated from the oral RfD. Additionally, as specified by EPA (1989b), dermal contact with carcinogenic polynuclear (or polycyclic) aromatic hydrocarbon (PAHs) should not be evaluated quantitatively because the slope factor for benzo(a)pyrene is based on the frequency of tumors at the point of contact, rather than on a systemic endpoint.

Dermal exposure typically is based on the absorbed dose, whereas oral exposure usually is expressed in terms of the administered dose. Consequently, dermal toxicity values derived from oral toxicity values also should be based on absorbed doses, rather than on administered doses (EPA 1989b). To account for the exposure route, a dermal slope factor is derived by dividing the oral slope factor by the fraction of the administered dose that is

absorbed across the gastrointestinal tract (i.e., the gastrointestinal absorption fraction). Dermal RfDs are derived by multiplying oral RfDs by the gastrointestinal absorption fraction. EPA Region 6 recommends using gastrointestinal absorption fractions of 0.05 (5%) and 1.0 (100%) to derive dermal toxicity values for metals and organic compounds, respectively (EPA 1992e). Consequently, the dermal RfDs and slope factors for organic compounds are equivalent to the oral toxicity values. These toxicity values were used to evaluate risks associated with dermal contact.

S.5.1.5 Lead Assessment

Meaningful oral and inhalation RfDs cannot be developed for lead because many of its noncancer effects may not exhibit a threshold in young children. Additionally, young children often are exposed to lead concurrently by air, soil, water, dust, diet, and paint. Recognizing this multimedia, multipathway potential for exposure, EPA developed the IEUBK model to evaluate childhood risks associated with lead exposure.

Young children represent the segment of the population at greatest risk from lead exposure. The reasons for children's relatively high sensitivity are twofold. First, in comparison to adults, their intake of lead from the gastrointestinal tract is greater (50% for children versus 6% for adults). Second, their developing organ systems are more sensitive to lead's toxic effects.

The IEUBK model predicts childhood blood lead levels expected to result from exposure to lead in soil and other media (air, water, dust, diet, and paint (EPA 1994e). EPA recommends a benchmark of either 95% of the sensitive population of children having blood lead levels below 10 μg/dL or a 95% probability of an individual child having a blood lead level below 10 μg/dL. Using default parameters, the model predicts a screening concentration of approximately 400 mg/kg lead in soil. Recent OSWER guidance (EPA 1994d) stresses that this 400 mg/kg screening concentration should not be interpreted as a cleanup goal. Rather, residential soil lead concentrations greater than 400 mg/kg may indicate a need for considering further action, but not necessarily for taking action.

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Lead-associated health risks posed to populations other than children (i.e., adolescents and adults) cannot be quantitatively evaluated because the IEUBK model is not applicable for these receptors. A detailed toxicological profile for lead is provided in Attachment S.D.

S.5.1.6 Toxicity Equivalency Factors for Evaluating Polynuclear Aromatic Hydrocarbons, Dioxins, and Furans

Polynuclear Aromatic Hydrocarbons

Benzo(a)pyrene is the most extensively studied PAH compound and is the only PAH for which EPA developed a cancer slope factor. Consequently, a Toxicity Equivalency Factor (TEF) approach is used to evaluate the potential cancer risks posed by other PAHs (EPA 1993a). TEFs are defined as the ratio of the toxicity of a given PAH to that of benzo(a)pyrene. Note that the term *Toxicity Equivalency Factor* is not currently used to describe the relative potency of PAHs; recent EPA guidance (EPA 1993a) recommends using the term *estimated order of potency*. However, the TEF terminology was used in this baseline HHRA to be consistent with EPA Region 6 guidance. The TEF approach is supported by the following scientific data:

- Benzo(a)pyrene exhibits a higher relative potency than almost all PAHs or PAH mixtures tested. Consequently, assuming that all carcinogenic PAHs are equal in potency to benzo(a)pyrene serves to overestimate risks; and

- Carcinogenic PAHs induce cancer by similar mechanisms, producing similar reactive metabolites, deoxyribonucleic acid adducts, and histologically similar tumors.

TEFs used in this baseline HHRA are (EPA 1993a):

Compound	TEF
Benzo(a)pyrene	1.0
Benzo(a)anthracene	0.1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.001

Dibenzo(a,h)anthracene	1.0
Indeno(1,2,3-c,d)pyrene	0.1

The TEFs are used to convert the concentration of each carcinogenic PAH to an equivalent concentration of benzo(a)pyrene (EPA 1993a). To apply the TEFs, the detected concentration of a given compound is multiplied by its TEF to yield the benzo(a)pyrene equivalent concentration. The converted concentrations then are multiplied by the slope factor for benzo(a)pyrene and the LADI to yield an excess lifetime cancer risk estimate for the given PAH.

Dioxins and Furans

Dioxins and furans were evaluated using 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD) TEFs (EPA 1989g). The TEF approach is derived from short-term biological tests, in which the relative toxicities of polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzo furans (PCDFs) congeners were evaluated (EPA 1989g). Analogous to the approach used for PAHs, TEFs are used to convert the concentration of each 2,3,7,8-TCDD congener and to an equivalent concentration of 2,3,7,8-TCDD; risks then are calculated by multiplying the converted concentration by the 2,3,7,8-TCDD slope factor and the LADI. The TEFs for PCDDs and PCDFs used in this baseline HHRA are presented in Table S.5-4.

S.5.2 TOXICITY ASSESSMENT UNCERTAINTIES

A degree of uncertainty is inherent in the numerical toxicity values used in any risk assessment; this uncertainty reflects the large number of assumptions and calculations associated with deriving slope factors and RfDs. The principal sources of uncertainty are described below.

S.5.2.1 Carcinogenic Toxicity Assessment Assumptions

Rodent bioassay and epidemiological studies would require tens of thousands of animals or human beings to determine whether a chemical is carcinogenic at low doses. The

estimated cancer slope factor is derived from several critical factors, including the relationship between tumor location, time to appearance, and the proportion of animals exhibiting tumors. Carcinogenic extrapolation models are used because animal bioassay or human epidemiological data are usually insufficient to directly estimate slope factors at low doses. These models are based on the assumption that there is no threshold dose below which carcinogenic risks will not occur. This is equivalent to assuming that a small but finite risk of cancer is associated with any dose above zero. EPA also assumes that the dose-response relationship is linear at low doses, in contrast to other toxic effects for which thresholds are assumed to exist.

The high-dose-to-low-dose extrapolation model favored by EPA and other federal regulatory agencies is the linearized multistage model. The EPA uses the statistically derived upper 95% confidence interval to derive slope factors, rather than a maximum likelihood value. Based on human epidemiological and animal data, EPA considers that cancer follows a series of discrete stages (i.e., initiation, promotion, and progression) that ultimately can result in uncontrolled cell proliferation (i.e., cancer). Consistent with this conclusion, the use of the linearized multistage model permits an upper-bound estimate of the slope factor. However, compelling scientific arguments can be made for several other extrapolative models that would result in significantly reduced values for slope factors. Thus, most EPA slope factors represent upper-bound values based on animal data, which should not necessarily be interpreted as equivalent to actual human cancer potencies.

S.5.2.2 Noncarcinogenic Toxicity Assessment Assumptions

Key assumptions used in assessing the likelihood of noncarcinogenic effects are that threshold doses exist below which various noncarcinogenic effects do not occur and that occurrence or absence of noncarcinogenic effects can be extrapolated between species and occasionally between routes of exposure and over varying exposure durations. Although the threshold assumption appears to be sound for most noncarcinogens, lead may not have a threshold for noncarcinogenic effects.

Other assumptions generally appear to be true to varying degrees. For example, the effects observed in one species or by one route of exposure may not occur in another species

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or by another route. The effects may occur at higher or lower doses because of differences in the biokinetics of a compound in different species or when exposure occurs by different routes. The uncertainty in these assumptions is taken into account by using UFs. These factors reflect uncertainty associated with species-to-species extrapolation and include safety factors to protect sensitive individuals. In addition to UFs, a modifying factor is applied to reflect a qualitative professional assessment of additional scientific uncertainties in the critical study and in the entire database. The uncertainty factors and modifying factors used by EPA are conservative (health-protective); consequently, the resulting RfDs are likely to be conservative.

S.5.2.3 Route-to-Route Extrapolation of Reference Doses and Slope Factors

Route-to-route extrapolation of RfDs and slope factors adds an additional source of uncertainty to the risk estimates. Such extrapolation may result in either under- or overestimation of the true risks for the extrapolated route. Although this practice adds uncertainty to the risk assessment process, it is preferable to omitting exposure to a chemical by a route for which no RfD or slope factor is available from the quantitative risk assessment, which would lead to underestimation of the overall risks posed by the chemical. In extrapolating oral toxicity values to dermal values, uncertainty is introduced because oral toxicity values are based on administered dose, whereas dermal toxicity values are based on absorbed doses (EPA 1992a).

S.5.2.4 Dioxin Toxicity

As part of its reassessment of the health risks posed by dioxin, EPA is preparing a draft health assessment document for public review and comment. This document was not formally released as of August 1994 when the HHRA was prepared, however, EPA apparently considers dioxin-like chemicals to be much more toxic than previously believed. Therefore, part of EPA's reassessment may include a re-evaluation of the RfDs and slope factors used to evaluate 2,3,7,8-TCDD and other compounds that exhibit dioxin-like toxicity (including other dioxins, furans, and certain polychlorinated biphenyls). Consequently,

considerable uncertainty is associated with the PCDD and PCDF risk estimates; potential impacts of dioxin-like compounds may be underestimated in this baseline HHRA.

S.5.2.5 Perspective on Toxicity Assessment Uncertainties

The toxicity assessment process compensates for the basic uncertainties described above by using UFs and MFs when assessing noncarcinogens, and by using the 95% UCL from the linearized multistage model for assessing carcinogens. These health-protective approaches ensure that the toxicity values used in the risk estimation process are unlikely to underestimate the toxicity of a chemical.

Table S.5-1

WEIGHT-OF-EVIDENCE CATEGORIES FOR CHEMICAL CARCINOGENICITY HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Group	Description
A	Human Carcinogen
B	Probable Human Carcinogen: B1: Limited human data are available. B2: Sufficient evidence in animals or no evidence in humans.
C	Possible Human Carcinogen
D	Not Classifiable
E	Evidence of Noncarcinogenicity for Humans

Source: United States Environmental Protection Agency, 1986.

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Table S.5-2

SUMMARY OF TOXICITY INFORMATION FOR CARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Carcinogenicity Classification	Route	Slope Factor (mg/kg/day)	Target Organ	Tumor Type	Species	Exposure Route	Source
Aldrin	B2	Oral	1.7E+01	Liver	Carcinomas	Mouse	Diet	IRIS
Arsenic	A	Oral	1.75	Lung	Tumors	Human	Drinking water	IRIS
Benzo[a]anthracene	B2	Oral	7.3E-01	—	—	—	—	ECAO[a]
Benzene	A	Oral	2.9E-02	Blood	Leukemia	Human	Inhalation, occupational	IRIS
Benzene	A	Inhalation	2.9E-02	Blood	Leukemia	Human	Inhalation, occupational exposure	IRIS
Benzo[a]pyrene	B2	Oral	7.3	Stomach	—	—	Diet	ECAO[a]
Benzo[b]fluoranthene	B2	Oral	7.3E-01	—	—	—	—	ECAO[a]
Benzo[k]fluoranthene	B2	Oral	7.3E-02	—	—	—	—	ECAO[a]
Beryllium	B2	Oral	4.3	Entire body	Gross tumors (all sites combined)	Rat	Drinking water	IRIS
Butyl benzyl phthalate	C	Oral	NA	—	—	—	—	—
Cadmium	B1	Oral	NA	—	—	—	—	—
Carbon tetrachloride	B2	Oral	1.3E-01	Liver	Carcinomas/hepatomas	Various animals	Gavage[b]	IRIS

Key at end of table.

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Table S.5-2

SUMMARY OF TOXICITY INFORMATION FOR CARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Carcinogenicity Classification	Route	Slope Factor (mg/kg/day)	Target Organ	Tumor Type	Species	Exposure Route	Source
Carbon tetrachloride	B2	Inhalation	5.25E-02	Liver	Carcinomas/hepatomas	Various animals	Gavage[b]	IRIS
Chloroform	B2	Oral	6.1E-03	Kidney	Tumors	Rat	Drinking water	IRIS
Chloroform	B2	Inhalation	8.0E-02	Liver	Carcinomas	Mouse	Gavage[b], oral, inhalation	IRIS
Chloromethane	C	Oral	1.3E-02	Kidney	Tumors	Mouse	Inhalation	HEAST
Chloromethane	C	Inhalation	6.3E-03	Kidney	Tumors	Mouse	Inhalation	HEAST
Chromium(VI)	A	Oral	NA	—	—	—	—	—
Chrysene	B2	Oral	7.3E-03	—	—	—	—	ECAO[a]
Di(2-ethylhexyl)phthalate	B2	Oral	1.4E-02	Liver	Carcinoma/adenomas	—	Diet	IRIS
Dibenz[a,h]anthracene	B2	Oral	7.3	—	—	—	—	ECAO[a]
4,4'-DDD	B2	Oral	2.4E-01	Liver	—	Mouse	Diet	IRIS
4,4'-DDE	B2	Oral	3.4E-01	Liver	Carcinomas/hepatomas	Mouse, hamster	Diet	IRIS
4,4'-DDT	B2	Oral	3.4E-01	Liver	Tumors	Mouse, rat	Diet	IRIS
1,1-Dichloroethene	C	Oral	6E-01	Adrenal glands	Pheochromocytomas	Rat	Drinking water	IRIS
1,1-Dichloroethene	C	Inhalation	1.75E-01	Kidney	Adenocarcinoma	Mouse	—	IRIS

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Table S.5-2

SUMMARY OF TOXICITY INFORMATION FOR CARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Carcinogenicity Classification	Route	Slope Factor (mg/kg/day)	Target Organ	Tumor Type	Species	Exposure Route	Source
Dieldrin	B2	Oral	1.6E+01	Liver	Carcinomas	Mouse	Diet	IRIS
Heptachlor	B2	Oral	4.5	Liver	Carcinomas	Mouse	Diet	IRIS
Heptachlor epoxide	B2	Oral	9.1	Liver	Carcinomas	Mouse	Diet	IRIS
Hexachlorobutadiene	C	Oral	7.8E-02	Kidney	Tubular adenomas/ adenocarcinomas	Rat	Diet	IRIS
Hexachlorobutadiene	C	Inhalation	7.7E-02	Kidney	—	Rat	Inhalation	IRIS
beta-Hexachlorocyclohexane	C	Oral	1.8	Liver	Nodules/carcinomas	Mouse	Diet	IRIS
Indeno[1,2,3-cd]pyrene	B2	Oral	7.3E-01	—	—	—	—	ECAO[a]
Lead	B2	Oral	NA	—	—	—	—	—
Methylene chloride	B2	Oral	7.5E-03	Liver	Adenomas, carcinomas, hepatocellular cancer, neoplastic nodules	Mouse	Inhalation; drinking water	IRIS
Methylene chloride	B2	Inhalation	1.6E-03	Liver	Adenomas/carcinomas	Mouse	—	IRIS
2-Methylphenol	C	Oral	NA	—	—	—	—	—
4-Methylphenol	C	Oral	NA	—	—	—	—	—
N-Nitrosodiphenylamine	B2	Oral	4.9E-03	Bladder	Transitional cell carcinoma	Rat	Drinking water	IRIS

Key at end of table.

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Table S.5-2

SUMMARY OF TOXICITY INFORMATION FOR CARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Carcinogenicity Classification	Route	Slope Factor (mg/kg/day)	Target Organ	Tumor Type	Species	Exposure Route	Source
2,3,7,8-TCDD	B2	Oral	1.5E+05	Respiratory system, liver	Tumors	Rat	Diet	HEAST
Trifluralin	C	Oral	7.7E-03	Kidney, bladder, and thyroid	Pelvis carcinomas, urinary bladder papillomas and/or thyroid adenomas and carcinomas	Rat	Diet	IRIS

Note: Because EPA has not promulgated dermal route SFs, oral route SFs were modified to evaulate substances by the dermal route. Dermal SFs were derived by dividing oral SFs by the gastrointestinal absorption fractions of 0.05 (5%) and 1.0 (10%) for metals and organic compounds.

[a] The slope factors for PAHs are based on the relative potencies of each PAH to benzo(a)pyrene (EPA 1993a).
[b] = Gavage - the administration of a liquid through a stomach tube.

Key:

— = Not applicable or information not available even though toxicity value is provided.
ECAO = Environmental Criteria and Assessment Office.
EPA = United States Environmental Protection Agency.
HEAST = United States Environmental Protection Agency, Health Effects Assessment Summary tables, annual update, FY1994.
IRIS = United States Environmental Protection Agency, Integrated Risk Information System, entries on line as of July 1994.
mg/kg/day = Milligrams per kilogram per day.
NA = Not available.
PAHs = Polynuclear aromatic hydrocarbons.
SFs = Slope factors

Source: Ecology and Environment, Inc., 1994

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Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Acenaphthene	Oral	Chronic	6.00E-02	3,000	1	Low	Liver	Hepatotoxicity	IRIS
Acenaphthene	Oral	Subchronic	6.00E-01	300	—	—	Liver	Hepatotoxicity	HEAST
Acetone	Oral	Chronic	1.00E-01	1,000	1	Low	Liver	Increased weight	IRIS
Acetone	Oral	Subchronic	1.00E+00	100	—	—	Liver	Increased weight	HEAST
Aldrin	Oral	Chronic	3.00E-05	1,000	1	Medium	Liver	Toxicity	IRIS
Aldrin	Oral	Subchronic	3.00E-05	1,000	—	—	Liver	Lesions	HEAST
Anthracene	Oral	Chronic	3.00E-01	3,000	1	Low	—	None observed	IRIS
Anthracene	Oral	Subchronic	3.00E+00	300	—	—	—	None observed	HEAST
Antimony	Oral	Chronic	4.00E-04	1,000	1	Low	Entire body	Encreased Longevity	IRIS
Antimony	Oral	Subchronic	4.00E-04	300	—	—	Entire body	Increased mortality	HEAST
Arsenic	Oral	Chronic	3.00E-04	3	1	Medium	Skin	Hyperpigmentation	IRIS
Arsenic	Oral	Subchronic	3.00E-04	3	—	—	Skin	Keratosis	HEAST
Barium	Oral	Chronic	7.00E-02	3	1	Medium	Cardiovascular system	Increased blood pressure	IRIS
Barium	Oral	Subchronic	7.00E-02	3	—	—	Cardiovascular system	Increased blood pressure	HEAST
Beryllium	Oral	Chronic	5.00E-03	100	1	Low	—	None observed	IRIS
Beryllium	Oral	Subchronic	5.00E-03	100	—	—	—	None observed	HEAST
Butyl benzyl phthalate	Oral	Chronic	2.00E-01	1,000	1	Low	Entire body	Increased liver/body weight	IRIS

Key at end of table.

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Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Butyl benzyl phthalate	Oral	Subchronic	2.00E+00	100	—	—	Liver	Altered weight	HEAST
Cadmium	Oral	Chronic	5.00E-04	10	1	High	Kidney	Significant proteinuria	IRIS
Cadmium	Oral	Subchronic	5.00E-04	—	—	—	Kidney	Significant proteinuria	Extrapolated from oral chronic value
Carbon disulfide	Oral	Chronic	1.00E-01	100	1	Medium	Fetus	Toxicity	IRIS
Carbon disulfide	Oral	Subchronic	1.00E-01	100	—	—	Fetus	Toxicity	HEAST
Carbon tetrachloride	Oral	Chronic	7.00E-04	1,000	1	Medium	Liver	Lesions	IRIS
Carbon tetrachloride	Oral	Subchronic	7.00E-04	—	—	—	Liver	Lesions	Extrapolated from oral chronic value
Chlorobenzene	Oral	Chronic	2.00E-02	1,000	1	Medium	Liver	Histopathologic changes	IRIS
Chlorobenzene	Oral	Subchronic	2.00E-02	—	—	—	Liver	Histopathologic changes	Extrapolated from oral chronic value
Chlorobenzene	Inhalation	Chronic	5.70E-03	10,000	—	—	Liver	Effects	HEAST
Chlorobenzene	Inhalation	Subchronic	5.70E-03	—	—	—	Liver	Effects	Extrapolated from oral chronic value
Chloroethane	Inhalation	Chronic	2.86E+00	300	1	Medium	—	—	IRIS

Key at end of table.

001160.0638

Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Chloroethane	Inhalation	Subchronic	2.86E+00	—	—	—	Bone, fetal	Delayed ossification	Extrapolated from oral chronic value
Chloroform	Oral	Chronic	1.00E-02	1,000	1	Medium	Liver	Fatty cyst formation	IRIS
Chloroform	Oral	Subchronic	1.00E-02	1,000	—	—	Liver	Lesions	HEAST
Chromium(VI)	Oral	Chronic	5.00E-03	500	1	Low	—	None observed	IRIS
Chromium(VI)	Oral	Subchronic	2.00E-02	100	—	—	—	None observed	HEAST
Copper	Oral	Chronic	3.70E-02	—	—	—	Gastrointestinal tract	Irritation	HEAST
Copper	Oral	Subchronic	3.70E-02	—	—	—	Gastrointestinal tract	Irritation	Extrapolated from oral chronic value
Cyanide, free	Oral	Chronic	2.00E-02	100	5	Medium	Entire body	Decreased weight	IRIS
Cyanide, free	Oral	Subchronic	2.00E-02	500	—	—	Entire body	Decreased weight	HEAST
Di(2-ethylhexyl)phthalate	Oral	Chronic	2.00E-02	1,000	1	Medium	Liver	Increased weight	IRIS
Di(2-ethylhexyl)phthalate	Oral	Subchronic	2.00E-02	—	—	—	Liver	Increased weight	Extrapolated from oral chronic value
Di-n-octyl phthalate	Oral	Chronic	2.00E-02	1,000	—	—	Kidney	Increased weight	HEAST
Di-n-octyl phthalate	Oral	Subchronic	2.00E-02	1,000	—	—	Kidney	Increased weight	HEAST
Diazinon	Oral	Chronic	9.00E-04	100	—	—	Blood	Decreased cholinesterase	HEAST

Key at end of table.

001160.0639

Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Diazinon	Oral	Subchronic	9.00E-04	100	—	—	Blood	Decreased cholinesterase	HEAST
Dibutyl phthalate	Oral	Chronic	1.00E-01	1,000	1	Low	Entire body	Increased mortality	IRIS
Dibutyl phthalate	Oral	Subchronic	1.00E+00	100	—	—	Entire body	Increased mortality	HEAST
1,2-Dichlorobenzene	Oral	Chronic	9.00E-02	1,000	1	Low	—	None observed	IRIS
1,2-Dichlorobenzene	Oral	Subchronic	9.00E-02	—	—	—	—	None observed	Extrapolated from oral chronic value
1,2-Dichlorobenzene	Inhalation	Chronic	5.70E-02	1,000	—	—	Entire body	Decreased weight gain	HEAST
1,2-Dichlorobenzene	Inhalation	Subchronic	5.70E-02	100	—	—	Entire body	Decreased weight gain	HEAST
1,4-Dichlorobenzene	Inhalation	Chronic	2.28E-01	100	1	Medium	Liver	Effects	IRIS
1,4-Dichlorobenzene	Inhalation	Subchronic	7.14E-01	30	—	—	Liver	Increased weight	HEAST
4,4'-DDT	Oral	Chronic	5.00E-04	100	1	Medium	Liver	Lesions	IRIS
4,4'-DDT	Oral	Subchronic	5.00E-04	100	—	—	Liver	Lesions	HEAST
1,1-Dichloroethylene	Oral	Chronic	9.00E-03	1,000	1	Medium	Liver	Lesions	IRIS
1,1-Dichloroethylene	Oral	Subchronic	9.00E-03	1,000	—	—	Liver	Lesions	HEAST
1,2- Dichloroethylene (Mixed isomers)	Oral	Chronic	9.00E-03	1,000	—	—	Liver	Lesions	HEAST
1,2- Dichloroethylene (Mixed isomers)	Oral	Subchronic	9.00E-03	1,000	—	—	Liver	Lesions	HEAST

Key at end of table

Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Methylene chloride	Oral	Chronic	6.00E-02	100	1	Medium	Liver	Toxicity	IRIS
Methylene chloride	Oral	Subchronic	6.00E-02	100	—	—	Liver	Toxicity	HEAST
Methylene chloride	Inhalation	Chronic	8.50E-01	—	—	—	—	—	—
Methylene chloride	Inhalation	Subchronic	8.50E-01	—	—	—	—	—	Extrapolated from oral chronic value
Dieldrin	Oral	Chronic	5.00E-05	100	1	Medium	Liver	Lesions	IRIS
Dieldrin	Oral	Subchronic	5.00E-05	100	—	—	Liver	Lesions	HEAST
Diethyl phthalate	Oral	Chronic	8.00E-01	1,000	1	Low	Entire body	Decreased growth	IRIS
Diethyl phthalate	Oral	Subchronic	8.00E-01	100	—	—	Entire body	Decreased growth	HEAST
Dimethyl phthalate	Oral	Chronic	1.00E+01	100	—	—	Kidney	Effects	HEAST
Dimethyl phthalate	Oral	Subchronic	1.00E+01	100	—	—	Kidney	Effects	HEAST
2,4-Dimethylphenol	Oral	Chronic	2.00E-02	3,000	1	Low	Entire body	Clinical signs (lethargy, prostation, ataxia)	IRIS
2,4-Dimethylphenol	Oral	Subchronic	2.00E-02	300	—	—	Nervous system	Effects	HEAST
Endosulfan	Oral	Chronic	6.00E-03	100	—	—	Entire body	Decreased weight gain	HEAST
Endosulfan	Oral	Subchronic	6.00E-03	100	—	—	Entire body	Decreased weight gain	HEAST
Endrin	Oral	Chronic	3.00E-04	100	1	Medium	Liver	Mild histological lesions	IRIS

Key at end of table.

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Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Endrin	Oral	Subchronic	3.00E-04	100	—	—	Central nervous system	Convulsions	HEAST
Ethyl chloride	Inhalation	Chronic	2.86E+00	300	1	Medium	Bone, fetal	Delayed ossification	IRIS
Ethyl chloride	Inhalation	Subchronic	2.86E+00	—	—	—	Bone, fetal	Delayed ossification	Extrapolated from oral chronic value
Ethylbenzene	Oral	Chronic	1.00E-01	1,000	1	Low	Liver	Toxicity	IRIS
Ethylbenzene	Oral	Subchronic	1.00E-01	—	—	—	Liver	Toxicity	Extrapolated from oral chronic value
Ethylbenzene	Inhalation	Chronic	2.86E-01	300	1	Low	Entire body	Developmental toxicity	IRIS
Ethylbenzene	Inhalation	Subchronic	2.86E-01	—	—	—	Entire body	Developmental toxicity	Extrapolated from oral chronic value
Fluoranthene	Oral	Chronic	4.00E-02	3,000	1	Low	Kidney	Nephropathy	IRIS
Fluoranthene	Oral	Subchronic	4.00E-01	300	—	—	Kidney	Nephropathy	HEAST
Fluorene	Oral	Chronic	4.00E-02	3,000	1	Low	Blood	Decreased red blood cells	IRIS
Fluorene	Oral	Subchronic	4.00E-01	300	—	—	Blood	Decreased red blood cells	HEAST
Heptachlor	Oral	Chronic	5.00E-04	300	1	Low	Liver	Increased weight	IRIS
Heptachlor	Oral	Subchronic	5.00E-04	300	—	—	Liver	Increased weight	HEAST

Key at end of table.

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Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Heptachlor epoxide	Oral	Chronic	1.30E-05	1,000	1	Low	Entire body	Increased liver/body weight	IRIS
Heptachlor epoxide	Oral	Subchronic	1.30E-05	1,000	—	—	Liver	Increased weight	HEAST
Hexachlorobutadiene	Oral	Chronic	2.00E-04	1,000	—	—	Kidney	Renal tubules regeneration	HEAST
Hexachlorobutadiene	Oral	Subchronic	2.00E-04	—	—	—	Kidney	Renal tubules regeneration	Extrapolated from oral chronic value
gamma-Hexachlorocyclohexane	Oral	Chronic	3.00E-04	1,000	1	Medium	Liver	Toxicity	IRIS
gamma-Hexachlorocyclohexane	Oral	Subchronic	3.00E-03	100	—	—	Liver	Toxicity	HEAST
Malathion	Oral	Chronic	2.00E-02	10	1	Medium	Blood	Cholinesterase depression	IRIS
Malathion	Oral	Subchronic	2.00E-02	10	—	—	Blood	Hematological effects	HEAST
Manganese	Oral	Chronic	1.40E-01	1	1	Varied	Central nervous system	Effects	IRIS
Manganese	Oral	Subchronic	1.40E-01	1	—	—	Central nervous system	Effects	HEAST
Mercury (Inorganic)	Oral	Chronic	3.00E-04	1,000	—	—	Kidney	Effects	HEAST
Mercury (Inorganic)	Oral	Subchronic	3.00E-04	1,000	—	—	Kidney	Effects	HEAST
Methoxychlor	Oral	Chronic	5.00E-03	1,000	1	Low	Entire body	Excessive loss of litters	IRIS

Key at end of table.

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Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Methoxychlor	Oral	Subchronic	5.00E-03	1,000	—	—	Reproduction	Rabbits (loss of litters)	HEAST
Methyl-ethyl-ketone	Oral	Chronic	6.00E-01	3,000	1	Low	Fetus	Decreased birth weight	IRIS
Methyl-ethyl-ketone	Oral	Subchronic	2.00E+00	1,000	—	—	Fetus	Decreased birth weight	HEAST
Methyl-ethyl-ketone	Inhalation	Chronic	2.80E-01	1,000	3	Low	Fetus	Decreased birth weight	IRIS
Methyl-ethyl-ketone	Inhalation	Subchronic	2.80E-01	3,000	—	—	Fetus	Decreased birth weight	HEAST
2-Methylphenol	Oral	Chronic	5.00E-02	1,000	1	Medium	Entire body	Decreased weight	IRIS
2-Methylphenol	Oral	Subchronic	5.00E-01	100	—	—	Entire body	Decreased weight	HEAST
4-Methylphenol	Oral	Chronic	5.00E-03	1,000	--	—	Entire body	Maternal death	HEAST
4-Methylphenol	Oral	Subchronic	5.00E-03	1,000	—	—	Central nervous system	Hypoactivity	HEAST
Nickel, soluble salts	Oral	Chronic	2.00E-02	300	1	Medium	Entire body	Decreased weight	IRIS
Nickel, soluble salts	Oral	Subchronic	2.00E-02	300	—	—	Entire body	Decreased weight	HEAST
Phenol	Oral	Chronic	6.00E-01	100	1	Low	Entire body	Decreased weight	IRIS
Phenol	Oral	Subchronic	6.00E-01	100	—	—	Fetus	Decreased weight	HEAST
Pyrene	Oral	Chronic	3.00E-02	3,000	1	Low	Kidney	Renal tubular pathology	IRIS
Pyrene	Oral	Subchronic	3.00E-01	300	—	—	Kidney	Effects	HEAST

Key at end of table.

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Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Selenium	Oral	Chronic	5.00E-03	3	1	High	Entire body	Selenosis	IRIS
Selenium	Oral	Subchronic	5.00E-03	3	—	—	Entire body	Selenosis	HEAST
Silver	Oral	Chronic	5.00E-03	3	1	Low	Skin	Argyria	IRIS
Silver	Oral	Subchronic	5.00E-03	3	—	—	Skin	Argyria	HEAST
Styrene	Oral	Chronic	2.00E-01	1,000	1	Medium	Blood	Red cell effects	IRIS
Styrene	Oral	Subchronic	2.00E-01	—	—	—	Blood	Red cell effects	Extrapolated from oral chronic value
Tetrachloroethylene	Oral	Chronic	1.00E-02	1,000	1	Medium	Liver	Hepatotoxicity	IRIS
Tetrachloroethylene	Oral	Subchronic	1.00E-01	100	—	—	Liver	Hepatotoxicity	HEAST
Toluene	Oral	Chronic	2.00E-01	1,000	1	Medium	Liver	Altered weights	IRIS
Toluene	Oral	Subchronic	2.00E+00	100	—	—	Liver	Altered weight	HEAST
1,2,4-Trichlorobenzene	Oral	Chronic	1.00E-02	1,000	1	Medium	Adrenal gland	Increased weight	IRIS
1,2,4-Trichlorobenzene	Oral	Subchronic	1.00E-02	1,000	—	—	Adrenal gland	Increased weight	HEAST
1,2,4-Trichlorobenzene	Inhalation	Chronic	5.70E-02	1,000	—	—	Liver	Non-adverse weight changes	HEAST
1,2,4-Trichlorobenzene	Inhalation	Subchronic	5.70E-02	100	—	—	Liver	Non-adverse weight changes	HEAST
Trifluralin	Oral	Chronic	7.50E-03	100	1	High	Liver	Increased weight	IRIS
Trifluralin	Oral	Subchronic	7.50E-03	100	—	—	Liver	Increased weight	HEAST
Vanadium	Oral	Chronic	7.00E-03	100	—	—	—	Lifetime	HEAST

Key at end of table.

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Table S.5-3

SUMMARY OF TOXICITY INFORMATION FOR NONCARCINOGENS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Chemical	Route	RfD Type	RfD (mg/kg/day)	Uncertainty Factor	Modifying Factor	Confidence Level	Target Organ	Critical Effect	Source
Vanadium	Oral	Subchronic	7.00E-03	1,000	—	—	—	Lifetime	HEAST
m-Xylene	Oral	Chronic	2.00E+00	100	—	—	Central nervous system	Hyperactivity	HEAST
m-Xylene	Oral	Subchronic	2.00E+00	—	—	—	Central nervous system	Hyperactivity	Extrapolated from oral chronic value
o-Xylene	Oral	Chronic	2.00E+00	100	—	—	Central nervous system	Hyperactivity	HEAST
o-Xylene	Oral	Subchronic	2.00E+00	—	—	—	Central nervous system	Hyperactivity	Extrapolated from oral chronic value
Xylenes	Oral	Chronic	2.00E+00	100	1	Medium	Central nervous system	Hyperactivity	IRIS
Xylenes	Oral	Subchronic	2.00E+00	—	—	—	Central nervous system	Hyperactivity	Extrapolated from oral chronic value
Zinc	Oral	Chronic	3.00E-01	3	1	Medium	Blood	Decreased, erythrocyte superoxide dismustase	IRIS
Zinc	Oral	Subchronic	3.00E-01	3	—	—	Blood	Decreased blood enzyme	HEAST

Key at end of table.

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Note: Because EPA has not promulgated dermal route RfDs, oral route RfDs were modified to evaulate substances by the dermal route. Dermal RfDs were derived by multiplying oral RfDs by the gastrointestinal absorption fractions of 0.05 (5%) and 1.0 (100%) for metals and organic compounds.

Noncarcinogenic toxicity indices were not available in IRIS or HEAST for 1,1,1-trichloroethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,3-dichlorobenzene; 2,3,7,8-TCDD; 2-methylnaphthalene; acenaphthylene; alpha-BHC; alpha-chlordane; aluminum; Aroclor-1254; Aroclor-1260; benzene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; beta-BHC; calcium; carbazole;chloromethane; chrysene; cobalt; DDD; DDE; dibenz(a,h)anthracene; dibenzofuran; endosulfan II; endosulfan sulfate; endrin aldehyde; endrin ketone; Freon 11; Freon 12; gamma-chlordane; indeno(1,2,3-cd)pyrene; iron; lead; magnesium; methane; naphthalene; N-nitrosodiphenylamine; phenanthrene; potassium; sodium; and trichloroethene.

Key:

— = Information not available.
RfDs = Reference dose.
IRIS = United States Environmental Protection Agency, Integrated Risk Information System, entries online as of July 1994.
HEAST = United States Environmental Protection Agency, Health Effects Assessment Summary Tables, Annual Update, FY 1994.

Source: Ecology and Environment, Inc., 1994

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Table S.5-4

TOXICITY EQUIVALENCY FACTORS FOR PCDDs AND PCDFs AGRICULTURE STREET LANDFILL SITE NEW ORLEANS, LOUISIANA

Congener	TEF
PCDD	
2,3,7,8-TCDD	1.0
Other TCDD	0.0
1,2,3,7,8-PeCDD	0.5
Other PeCDD	0.0
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
Other HxCDD	0.0
1,2,3,4,6,7,8-HpCDD	0.01
Other HpCDD	0.0
OCDD	0.001
PCDF	
2,3,7,8-TCDF	0.1
Other TCDF	0.0
1,2,3,7,8-PeCDF	0.05
2,3,4,7,8-PeCDF	0.5
Other PeCDF	0.0
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
Other HxCDF	0
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
Other HpCDF	0.0
OCDF	0.001

Source: United States Environmental Protection Agency, 1989g.

S.6 RISK CHARACTERIZATION

S.6.1 INTRODUCTION

This section combines information developed in the exposure and toxicity assessment sections (Sections S.4 and S.5) to identify contaminants of potential concern (COPCs) and estimate potential risks posed to human health at the ASL site. Except for the trespasser scenario, risks associated with current exposure scenarios were derived from data collected in the developed area of the landfill. Future scenario risk estimates reflect potential exposures to undeveloped areas of the ASL site.

S.6.1.1 Cancer Risk

Potential cancer risks are assessed by multiplying the estimated LADI, or absorbed dose of a carcinogen, by its slope factor (SF). This calculated risk is expressed as the probability of an individual developing cancer over a lifetime and is an estimated upper-bound incremental probability.

Cancer risks initially are estimated separately for exposure to each chemical for each exposure pathway and receptor category (i.e., adult or child). Separate cancer risk estimates then are summed across chemicals, receptors, and all exposure pathways to obtain total excess lifetime cancer risk for the exposed population. This process is performed for each exposure scenario evaluated at the ASL site. Cancer risk estimates are provided in scientific notation; therefore, 1×10^{-6} is equivalent to 1E-6, which equals 0.000001 (see the Glossary and Units section for a complete description of terms and units used).

S.6.1.2 Noncancer Effects

The potential for adverse effects resulting from exposure to noncarcinogens is assessed by comparing the COPC-specific CDI or absorbed dose of a substance to its chronic or subchronic RfD. This comparison is made by calculating the ratio of the estimated CDI to the corresponding RfD to yield a hazard quotient (HQ):

$$HQ = \frac{CDI}{RfD}$$

For example, if the CDI of a contaminant is equal to the RfD, the HQ is 1; if the daily intake is less than or greater than the RfD, the HQ is less than or greater than 1, respectively. HQs for individual chemicals are summed to yield HIs. This methodology, unlike that used to evaluate cancer risk, is not a true measure of risk (i.e., it does not predict the relative likelihood of the occurrence of adverse effects). Although exceedance of an RfD (i.e., an HQ greater than 1) is regarded as a regulatory benchmark by EPA and other agencies, risk assessors regard RFDs as relatively "soft" estimates, whose bounds of uncertainty can span an order of magnitude. While exposures somewhat higher than the RfD are associated with an increased probability of adverse effects, considerable uncertainty is associated with that probability. Similarly, while the RfD is the exposure level at which the probability of adverse effects is low, the absence of all risk to all people exposed cannot be assured (EPA 1988c).

HQs are presented separately for each receptor evaluated (i.e., adults, children, trespassers, and workers). The receptor-specific HQs then are summed across chemicals and exposure pathways for each scenario. Separate HIs for various types of adverse health effects are calculated only if the overall HIs exceed 1. Separate HIs are not calculated when the highest HI value is primarily attributable to a single chemical. In addition, HQs associated with potential inhalation exposure were not summed with other pathways because the endpoints of inhalation toxicity are incomparable to systemic effects associated with oral and dermal exposures (EPA 1989b).

Section S.6.2 presents tabulated risk estimates; summarizes risk estimation results; and identifies chemicals, pathways, and receptors that account for the most significant potential risks associated with the ASL site. In Section S.6.3, the risk characterization for lead is presented. Lead was evaluated extensively because of potential exposure to on-site children. Finally, Section S.6.4 summarizes the COPCs associated with the ASL, and Section S.6.5 discusses uncertainties associated with the risk characterization.

S.6.2 RISK ESTIMATES

Tables containing estimates of EPCs and associated risk calculations for the evaluated scenarios are contained in Attachments S.A and S.B, respectively. In this section, risk estimates are summarized and discussed for current and future scenarios. SFs used in calculating cancer risk estimates, along with carcinogenicity classification, administration route, species, and target organ and tumor type, are presented in Table S.5-2. Table S.5-3 lists noncancer criteria, including RFDs, uncertainty and modifying factors, target organs, and critical effects. Calculated risk estimates are presented in Tables S.6-1 and S.6-2 (cancer) and S.6-3 and S.6-4 (noncancer).

Federal environmental laws and regulations recognize that estimates of very small levels of risk are insignificant. The concept of *de minimis* risk refers to a specific level below which risks are so small that they are not of concern. In risk assessment, government agencies recognize that cancer risks less than 1×10^{-6} are generally *de minimis* and risks between 1×10^{-6} and 1×10^{-4} are within the generally acceptable range. The EPA Superfund program adopted these regulatory ranges, which are used to place the estimated excess lifetime cancer risks into context (EPA 1992g).

For evaluating noncarcinogenic effects, EPA defines acceptable exposure levels as those to which the human population, including sensitive subgroups, may be exposed without adverse effects during a lifetime or part of a lifetime, incorporating an adequate margin of safety (EPA 1989b). This acceptable exposure level is approximated by an HI equal to 1. If the HI is less than 1, adverse effects usually would not be expected. However, adverse effects may occur when the HI is greater than 1.

S.6.2.1 Cancer Risks

S.6.2.1.1 Current Exposure Scenarios

As shown in Table S.6-1, five exposure scenarios were evaluated under current conditions: residential, Moton School children, children at Press Park Community Center, workers, and trespassers. The total excess lifetime cancer risks evaluated using RME assumptions exceeded EPA's benchmark of 1×10^{-6} for all scenarios, and the current residential and worker scenarios had cancer risk estimates that exceeded the upper bound of the generally acceptable risk range (1×10^{-4}). The risk estimate for the residential scenario (i.e., adults and children) of 8×10^{-4} was associated mainly with inhalation exposure to chloroform in indoor and outdoor air and ingestion exposure to 2,3,7,8-TCDD (equivalents). Table S.6-5 shows current residential cancer risk for each COPC. The worker scenario cancer risk of 2×10^{-4}, however, was driven by chloroform exposure.

Using average exposure assumptions to evaluate residential and worker scenarios yielded excess lifetime cancer risk estimates of 2×10^{-4} and 5×10^{-5}, respectively. In this case, the main risk contributor for current residents was chloroform in indoor and outdoor air. In most scenarios, incidental soil ingestion risks were similar to dermal contact to soil risks. The incidental ingestion of soil risks were mainly driven by arsenic and 2,3,7,8-TCDD (equivalents).

S.6.2.1.2 Future Exposure Scenarios

Residential, worker, and trespasser scenarios were evaluated to assess potential future cancer risks (Table S.6-2). The total excess lifetime cancer risks evaluated using RME assumptions exceeded EPA's benchmark of 1×10^{-6} for all scenarios, and the cancer risks associated with the residential scenario exceeded the upper bound of the generally acceptable risk range (1×10^{-4}). Total cancer risk estimates of 3×10^{-3} or 5×10^{-4} were calculated, assuming that potential future residents will derive their tap water from the shallow or deep (sand unit) water-bearing zones, respectively. Arsenic was the main contributor to ground-water cancer risk estimates through ingestion in these wells. Arsenic and 2,3,7,8-TCDD (equivalents) were the main COPCs in soil driving the residential soil ingestion risk estimates.

Using average exposure assumptions to evaluate future residential scenarios yielded cancer risk estimates of 5×10^{-4} and 4×10^{-5}, assuming that residents will obtain their tap water from shallow and deep wells, respectively. The average future worker scenario yielded an excess lifetime cancer risk estimate of 5×10^{-6}; the major contributor to this cancer risk estimate was incidental ingestion of soil containing arsenic and 2,3,7,8-TCDD (equivalents).

S.6.2.2 Noncancer Effects

S.6.2.2.1 Current Exposure Scenarios

The scenarios evaluated to assess current noncancer effects at the ASL site are presented in Table S.6-3. Only HIs associated with the current residential scenario exceeded EPA's regulatory benchmark of 1. Ingestion of homegrown produce containing diazanon accounted for approximately 60% of the total adult and child HIs of 2 and 5, respectively. Inhalation of 1,4-dichlorobenzene in indoor air by a child (HI = 2) also exceeded the regulatory benchmark.

Using average exposure assumptions to evaluate residential and worker scenarios yielded HIs of 1 and 0.03, respectively.

S.6.2.2.2 Future Exposure Scenarios

The scenarios evaluated to assess future noncancer effects at the ASL site are presented in Table S.6-4. Only the future residential RME HIs exceeded EPA's regulatory benchmark of 1. Because the HIs associated with RME residential ingestion of groundwater greatly exceeded 1, the HQs for the individual COPCs were segregated by target organ or system. This segregation was accomplished by the following stepwise process:

- Any COPC that exhibited an HQ of 0.5 or greater for the future child residential RME scenario (ingestion of groundwater [shallow wells; see Table S.B-40]) was included in the HQ segregation. The RME child was evaluated because this is the most conservative receptor;

- The sources of the COPC's RfDs were reviewed (i.e., IRIS or HEAST) to determine the critical endpoint(s), NOAEL(s), and LOAEL(s), if any, that were used to derive the chronic RfDs;

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- The appropriate Agency for Toxic Substances and Disease Registry toxicological profiles were consulted to determine what, if any, additional toxic effects could be associated with CDIs within an order of magnitude of the NOAEL or LOAEL used to derive the RfD; and

- HQs then were segregated and total HIs calculated according to target organ or system for the child and adult RME, in addition to average adult exposures.

The results of the HQ segregation analysis are presented in Table S.6-6. Arsenic was the main COPC in groundwater from the shallow wells, contributing significantly to the segregated HIs for cardiovascular, gastrointestinal, neurological, and skin effects.

Selenium was the main COPC in groundwater from deep wells, accounting for approximately 80% of the total HI for residential groundwater ingestion. HQs were not segregated by target organ or system, however, because selenium accounted for the majority of the total HI and fewer inorganic compounds were present.

Arsenic was the major COPC in soil, contributing 40% to the total HI for incidental soil ingestion.

Using average exposure assumptions, the residential HI for all exposure pathways was 12 or 2, assuming use of groundwater from shallow or deep wells, respectively. The average worker scenario yielded a total HI of 0.2.

S.6.3 RISK CHARACTERIZATION FOR LEAD

As described in Section S.5 (Toxicity Assessment), EPA-verified RfDs and slope factors are unavailable for lead. Consequently, the approach used to characterize the potential adverse health effects associated with lead exposure differs from that used to evaluate other COPCs. Recognizing the multimedia nature of lead exposure, EPA developed the IEUBK model to evaluate the dose-response relationship between children's blood lead levels and lead concentrations in environmental media.

The IEUBK model focuses on the potential adverse health effects posed to infants and young children. The model predicts the probability that children exposed to lead in their environment will have blood lead concentrations exceeding a health-based level of concern.

Because adverse health effects are associated with childhood blood lead levels at or below 10 μg/dL, EPA considers that a typical or hypothetical child should have no more than a 5% probability of exceeding a blood lead level of 10 μg/dL.

The exposure area evaluated in the IEUBK model is defined as an area appropriate for making remediation decisions (i.e., a residential yard within a single housing unit or an equivalent area for multibuilding units or undeveloped lots). The home and its surrounding yard represent the basic unit evaluated because lead exposure for preschool children commonly occurs within this area. In this baseline HHRA, current potential childhood (0 to 6 years) risks associated with lead were evaluated at the SGRs in the developed area of the landfill, and potential future risks were evaluated using data collected from the undeveloped area.

S.6.3.1 Study Group Residence Evaluation

As described in Section S.4 (Exposure Assessment), tap water, yard soils, and household dust data collected from the SGRs were used as input to the IEUBK model. The IEUBK model was applied assuming two approaches. In the first approach, the probability that a single child's blood lead concentration would exceed 10 μg/dL at an individual SGR was determined. This single-child assessment is used to evaluate remediation options on a house-by-house or yard-by-yard basis. In the second approach, the average probability was calculated to estimate a neighborhood-wide risk of elevated blood lead levels.

S.6.3.1.1 Individual Study Group Residence Results

The model output from this evaluation, which assumes a single child at a single site of exposure, is the probability of exceeding the blood lead level of concern (i.e., 10 μg/dL). Because children in environments with the same lead exposure may exhibit a range of blood lead concentrations, the variability in blood lead levels for a given child is described by a probability distribution. The predicted blood lead concentration is the geometric mean of the distribution of blood lead levels that may occur for a typical child under the specified exposure conditions.

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The environmental medium input concentrations and probabilities of exceeding the 10 μg/dL blood lead level of concern are presented for each SGR in Table S.6-7. Children at 13 of the 33 SGRs were predicted to have a greater than 5% chance of exceeding a blood lead level of 10 μg/dL. The highest probability of exceeding 10 μg/dL was observed at SG-004 (40.4%). This residence exhibited the highest average lead concentration in household dust (876 mg/kg). The second highest probability of exceeding 10 μg/dL was observed at SG-019 (19.8%); this residence exhibited the highest average lead concentration in surface soil (1,046 mg/kg).

Correlation Analysis

Correlation analysis was performed to determine whether environmental media were correlated with a probability of exceeding the 10 μg/dL benchmark. In this analysis, yard soil and household dust lead concentrations were compared to the model output (too few data points were available for paint chips and yard soils to perform this analysis and the majority of water analyses yielded nondetected values, unsuitable for analysis). This analysis generated a correlation coefficient (r^2) of 0.43 for combined soil and dust concentrations versus the probability of exceedance (a perfect correlation is indicated by an r^2 value of 1). Thus, average lead concentrations in soil and dust may be slightly correlated with the probability of an individual child's blood lead level exceeding 10 μg/dL (i.e., when the soil or dust concentration was low, then the probability of exceedance was usually low; conversely, when the average soil or dust concentration was high, then the probability of exceedance was usually high).

A second analysis was performed to investigate a possible correlation between lead concentrations in yard soil and household dust. Backyard soil was selected because it was thought to have a greater chance of being tracked into the home (driveways and landscape would minimize tracking of front yard soils). A relatively high correlation would be expected if a significant fraction of household dust originated from outdoor soils (i.e, from dirt tracked into the home on shoes or by pets). However, this analysis revealed an r^2 of 0.002,

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suggesting an extremely poor correlation between dust and soil concentrations. Other correlations between various media were performed, but distinguishing features were not evident.

To summarize, correlation analysis revealed that lead concentrations in soil and dust may be correlated with probability of exceedance. Therefore, these environmental media are the principal contributors to the predicted blood lead level. However, high lead concentrations in soil do not necessarily indicate that indoor dust lead concentrations also would be high; conversely, high indoor dust lead concentrations do not necessarily indicate high lead concentrations in soil.

Comparison to Background Residences

To place the blood lead risk values derived from the SGRs into perspective, the IEUBK model also was conducted using equivalent environmental data and input parameters from five background homes. These background homes were assumed to be unaffected by the landfill. This analysis revealed that a single background residence (SG-036) exceeded a 5% probability of an individual child exceeding a blood lead level of 10 μg/dL (Table S.6-8). In addition, this residence had an average soil lead concentration (997 mg/kg) and an estimated probability of exceedance (23.8%) greater than all but one of the on-site SGR values. These relatively high soil data may be attributable to exterior lead based paint since high lead paint values were observed (67,600 mg/kg). As mentioned in Section 5.3.4.1, this residence is an outlier. However, the remainder of the background residences exhibited probabilities of exceedance lower than any of the SGRs.

S.6.3.1.2 Neighborhood Evaluation Results

The arithmetic average probability of exceeding a blood lead level of 10 μg/dL yielded an estimate of 6.1% of children in the neighborhood comprising the SGRs (Table S.6-6).

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Comparison to Background Residences

Using average input values analogous to SGRs, the probability of exceeding a blood lead level of 10 μg/dL in background homes yielded an estimate of 0.87% of children exceeding a blood lead level greater than 10 μg/dL. This result suggests that children living in the SGRs are more likely to have a blood lead level greater than 10 μg/dL as compared to background residences. However, if SG-036 is excluded from the background dataset, only 0.04% of children would be expected to have a blood lead level greater than 10 μg/dL, suggesting a larger difference between background and SGRs.

Summary of Study Group Residence Evaluation

The major conclusions of the risk characterization for lead at the SGRs are:

- Children at 39% (13 of 33) of the SGRs were predicted to have a greater than 5% chance of exceeding a blood lead level of 10 μg/dL;
- Concentrations of lead in soil and dust were the principal influences on the predicted blood lead levels;
- Children living in the neighborhood comprising the SGRs were predicted to have a 6.1% probability of a blood lead level greater than 10 μg/dL. This is marginally above EPA's regulatory benchmark of 5%; and
- The predicted percentage of children at background residences and exceeding a blood lead level of 10 μg/dL (0.87%) was lower than that for children living in the SGRs (6.1%).

S.6.3.2 Undeveloped Area Evaluation

The IEUBK model also was applied to data collected in the undeveloped area of the landfill. The purpose of this analysis was to evaluate potential lead-associated risks if residential development occurs at this location in the future. To accomplish this analysis, surface soil lead data derived from sampling and analysis of the undeveloped area were used as input to the IEUBK model. It was assumed that each grid node represented a residential unit. In the SGR evaluation, analytical data were available for surface soil, indoor dust, paint, and tap water. However, because homes are not on the undeveloped area of the

landfill, analytical data were only available for surface soil. Consequently, model default parameters were used for lead household dust, produce, and paint chips. Additionally, the SGR evaluation was based on sieved soil samples, whereas the samples collected and analyzed from the undeveloped area were not sieved. Therefore, the actual lead concentrations to which children would be exposed at the two study locations may not be equivalent.

As shown in Table S.6-9, hypothetical children residing at 35 of 50 sample locations were predicted to have a greater than 5% chance of exceeding a blood lead level of 10 μg/dL. This result reflects the relatively high concentrations of lead detected in soil at the undeveloped area. The highest detected soil lead concentration was 28,307 mg/kg in sample (AL-GL009-SS-01); 27 samples exhibited concentrations greater than 1,000 mg/kg. The relationship between soil lead concentration and probability of exceeding a blood lead level of 10 μg/dL is shown graphically in Figure S.6-1. These data suggest that EPA's benchmark of a 5% probability of a blood lead level greater than 10 μg/dL is exceeded when the soil lead concentration exceeds 400 mg/kg. This result is consistent with EPA's recent directive on soil lead screening concentrations (EPA 1994d).

Averaging the probabilities of exceeding a blood lead level of 10 μg/dL generated for the individual sample locations yielded an estimate of 37% of hypothetical children exceeding a blood lead level of 10 μg/dL in a future neighborhood comprising the sample locations.

S.6.3.3 Conclusions of the Lead Risk Characterization

The conclusions of the IEUBK model for the SGRs and the undeveloped area of the landfill are summarized as follows:

- The predicted percentage of children exceeding a blood lead level of 10 μg/dL in the neighborhood comprising the SGRs was 6.1%, which is slightly above EPA's regulatory benchmark of 5%; and
- Because of the relatively high lead concentrations in surface soil at the undeveloped area, the predicted percentage of children exceeding a blood lead level of 10 μg/dL was 37%, which greatly exceeds the regulatory benchmark of 5%.

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S.6.4 SUMMARY OF CONTAMINANTS OF POTENTIAL CONCERN

The COPCs at the ASL site are summarized in Tables S.6-10 and S.6-11 based on current residential exposure and future exposure scenarios, respectively. It should be noted that the future exposure scenario includes an evaluation of domestic groundwater use. The listed chemicals either exceeded a noncancer HQ of 1 or an excess lifetime cancer risk of 1×10^{-6} in at least one residential exposure scenario.

S.6.5 RISK CHARACTERIZATION UNCERTAINTIES

The risk characterization combines and integrates the information developed in the COPC selection process and the exposure and toxicity assessments. Therefore, uncertainties associated with these aspects of the baseline HHRA also affect the degree of confidence that can be placed in risk characterization results. Sections S.3.6, S.4.6, and S.5.2 provide full discussions of uncertainties associated with COPC selection, exposure assessment, and toxicity assessment, respectively. The main site-specific risk characterization uncertainties are presented in the following subsections.

S.6.5.1 Comparison of Indoor Air Concentrations to Off-Site Background

Although current risks associated with inhalation of VOCs in indoor air yielded excess lifetime cancer risks greater than 1×10^{-6}, the extent to which these risks reflect site-specific contamination is unclear. Presence of VOCs in indoor air could reflect the use of solvent-containing products within a building, rather than environmental contamination at the ASL site. Additionally, heating of chlorinated tap water in showers could release relatively high indoor air concentrations of such chlorinated hydrocarbons as chloroform (Shah 1988).

The estimated total excess lifetime cancer risk by inhalation posed to Moton School children was 7×10^{-6}; this risk is mainly due to benzene (4×10^{-6}) and chloroform (3×10^{-6}). However, the mean benzene and chloroform air concentrations at Moton School (1.5 and 0.32 parts per billion [ppb], respectively) were lower than those detected in background homes (3.1 and 0.47 ppb, respectively). Consequently, it is unlikely that the benzene and chloroform detected in the indoor air at Moton School are due to site-related emissions.

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Similarly, the total excess lifetime cancer risk, by inhalation, posed to children living in the SGRs was 4×10^{-4}; 90% of the risk was attributable to chloroform. However, the maximum detected chloroform concentration in the background residences (0.66 ppb) was exceeded in only eight of the 33 SGRs evaluated. Consequently, it is not possible to definitively attribute the chloroform found in the SGRs to site-related contamination.

S.6.5.2 Consumption of Garden Produce

The residential ingestion of garden produce noncancer adult RME cancer risk of four was primarily associated with diazinon. Diazinon is a commonly used organophosphate insecticide.

S.6.5.3 Future Groundwater Use

Significant cancer and noncancer risks were associated with the use of groundwater, beneath the ASL site, as a source of domestic water. However, it is unlikely that this water would ever be used as a residential water supply because the groundwater is brackish and would require extensive treatment before meeting drinking water quality standards. Currently, all drinking water at the ASL site is supplied by the City of New Orleans and obtained from the Mississippi River (Jaynes 1994).

Table S.6-1

CURRENT SCENARIOS: CANCER RISKS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Exposure Scenario[a]	Exposure Pathway	Medium	RME[b]	Average
Residential	Incidental ingestion	Soil	1E-4	1E-5
	Dermal contact	Soil	3E-5	2E-6
	Inhalation	Outdoor Air	3E-4	7E-5
	Inhalation	Indoor Air	4E-4	1E-4
	Produce ingestion	Homegrown produce	3E-8	4E-9
Total Residential:			**8E-4**	**2E-4**
Worker	Ingestion	Soil	1E-5	8E-7
	Dermal contact	Soil	2E-5	2E-7
	Inhalation	Outdoor Air	1E-4	5E-5
Total Worker:			**2E-4**	**5E-5**
Trespasser	Ingestion	Soil	9E-6	---
	Dermal contact	Soil	6E-6	---
	Inhalation	Outdoor Air	3E-6	---
Total Trespasser:			**2E-5**	**NA**
Press Park	Incidental ingestion	Soil	2E-5	---
Community Center	Dermal contact	Soil	1E-5	---
Total Press Park Community Center:			**3E-5**	**NA**
Moton School	Incidental ingestion	Soil	3E-6	---
	Dermal contact	Soil	2E-6	---
	Inhalation	Outdoor Air	4E-6	---
	Inhalation	Indoor Air	7E-6	---
Total Moton School:			**2E-5**	**NA**

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) The cancer risk estimate is the sum of childhood and adult risks for RME.

Source: Ecology and Environment, Inc., 1994

Table S.6-2

POTENTIAL FUTURE SCENARIOS
CANCER RISKS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL[a]
NEW ORLEANS, LOUISIANA

Exposure Scenario	Exposure Pathway	Medium	RME	Average
Residential (Shallow well)	Incidental ingestion	Soil	2E-4	2E-5
	Dermal contact	Soil	6E-5	2E-5
	Inhalation	Outdoor Air	2E-5	5E-6
	Ingestion	Groundwater (Shallow Well)[b]	2E-3	4E-4
	Inhalation	Groundwater (Shallow Well) [b,c]	---	---
	Dermal contact	Groundwater (Shallow Well)[b]	6E-6	1E-6
Total Residential (shallow well):			**3E-3**	**5E-4**
Residential (Deep well)	Incidental ingestion	Soil	2E-4	2E-5
	Dermal contact	Soil	6E-5	2E-5
	Inhalation	Outdoor Air	2E-5	5E-6
	Ingestion	Groundwater (Deep Well)[b]	3E-6	5E-7
	Inhalation	Groundwater (Deep Well)[b]	7E-8	1E-8
	Dermal contact	Groundwater (Deep Well)[b]	2E-6	4E-7
Total Residential (deep well):			**3E-4**	**4E-5**
Worker	Ingestion	Soil	2E-5	1E-6
	Dermal contact	Soil	3E-5	3E-7
	Inhalation	Outdoor Air	9E-6	3E-6
Total Worker:			**6E-5**	**5E-6**
Trespasser	Ingestion	Soil	1E-5	---
	Dermal contact	Soil	7E-6	---
Total Trespasser:			**2E-5**	**NA**

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) Exposure to groundwater assumes drinking water is derived from the maximally contaminated wells; "shallow wells" are 5 to 15 feet deep, and "deep wells" are 60 to 70 feet deep.
(c) No carcinogenic VOCs were detected in shallow wells.

Source: Ecology and Environment, Inc. 1994

Table S.6-3

CURRENT SCENARIOS: NONCANCER HAZARD INDICES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Exposure Scenario[a]	Exposure Pathway	Medium	RME		Average
			Adult	Child	Adult
Residential	Incidental ingestion	Soil	0.1	0.9	0.1
	Dermal contact	Soil	0.09	0.1	0.02
	Inhalation[b]	Outdoor Air	0.05	0.05	0.05
	Inhalation[b]	Indoor Air	1	2	1
	Produce ingestion	Homegrown produce	2	4	1
Total Residential:			**2**	**5**	**1**
Worker	Ingestion	Soil	0.06	---	0.01
	Dermal contact	Soil	0.1	---	0.003
	Inhalation[b]	Outdoor Air	0.03	---	0.03
Total Worker:			**0.2**	**NA**	**0.01**
Trespasser	Ingestion	Soil	0.2	---	---
	Dermal contact	Soil	0.2	---	---
	Inhalation[b]	Outdoor Air	0.007	---	---
Total Trespasser:			**0.4**	**NA**	**NA**
Press Park	Incidental ingestion	Soil	---	0.7	---
Community Center	Dermal contact	Soil	---	0.3	---
Total Press Park Community Center:			**NA**	**1**	**NA**
Moton School	Incidental ingestion	Soil	---	0.1	---
	Dermal contact	Soil	---	0.06	---
	Inhalation[b]	Outdoor Air	---	0.02	---
	Inhalation[b]	Indoor Air	---	0.05	---
Total Moton School:			**NA**	**0.2**	**NA**

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) Inhalation HIs are not included in scenario totals as discussed in Section S.6.1.2.

Source: Ecology and Environment, Inc., 1994

Table S.6-4

POTENTIAL FUTURE SCENARIOS
NONCANCER HAZARD INDICES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL[a]
NEW ORLEANS, LOUISIANA

Exposure Scenario	Exposure Pathway	Medium	RME		Average
			Adult	Child	Adult
Residential (Shallow Well)	Incidental ingestion	Soil	0.4	4	0.4
	Dermal contact	Soil	0.4	0.4	0.4
	Inhalation[b]	Outdoor Air	0.01	0.01	0.01
	Ingestion	Groundwater (Shallow Well)[c]	16	36	11
	Inhalation[b]	Groundwater (Shallow Well)[c]	0.00002	0.00003	0.00002
	Dermal contact	Groundwater (Shallow Well)[c]	0.04	0.06	0.03
Total Residential (shallow well):			**17**	**40**	**12**
Residential (Deep Well)	Incidental ingestion	Soil	0.4	4	0.4
	Dermal contact	Soil	0.4	0.4	0.4
	Inhalation[b]	Outdoor Air	0.01	0.01	0.01
	Ingestion	Groundwater (Deep Well)[c]	0.7	2	0.5
	Inhalation[b]	Groundwater (Deep Well)[c]	---	---	---
	Dermal contact	Groundwater (Deep Well)[c]	0.02	0.03	0.01
Total Residential (deep well):			**2**	**6**	**1**
Worker	Ingestion	Soil	0.1	---	0.02
	Dermal contact	Soil	0.2	---	0.01
	Inhalation[b]	Outdoor Air	0.01	---	0.01
Total Worker:			**0.4**	**---**	**0.04**
Trespasser	Ingestion	Soil	0.2	---	---
	Dermal contact	Soil	0.2	---	---
Total Trespasser:			**0.4**	**---**	**---**

Key:

RME: Reasonable maximum exposure.
---: Not evaluated because exposure parameter values and/or information were unavailable.
NA: Not applicable.

(a) All scenarios reflect risks associated with the developed portion of the ASL except the trespasser scenario, which evaluates the undeveloped portion.
(b) Inhalation HIs are not included in scenario totals as discussed in Section S.6.1.2.
(c) Exposure to groundwater assumes drinking water is derived from the maximally contaminated wells; "shallow wells" are 5 to 15 feet deep, and "deep wells" are 60 to 70 feet deep.

Source: Ecology and Environment, Inc. 1994

Table S.6-5

CURRENT RESIDENTIAL EXPOSURE PATHWAYS
RISK BY INDIVIDUAL CHEMICAL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Exposure Pathway	Chemical	RME	Average
Incidental ingestion	Arsenic	3E-5	3E-6
	PAHs	3E-6	3E-7
	2,3,7,8-TCDD (Equiv)	7E-5	8E-6
Dermal contact	Arsenic	1E-5	7E-7
	2,3,7,8-TCDD (Equiv)	2E-5	8E-7
Inhalation (Outdoor)	Benzene	3E-5	8E-6
	Chloroform	4E-4	1E-4
	Chloromethane	1E-6	3E-7
	1,1-Dichlorethene	2E-6	7E-7
Inhalation (Indoor)	Benzene	4E-5	1E-5
	Chloroform	2E-4	6E-5
	Chloromethane	7E-7	2E-7

Key:

RME: Reasonable maximum exposure.

2,3,7,8-TCDD (Equiv): 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents

Source: Ecology and Environment, Inc., 1994

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Table S.6-6

SEGREGATION OF HAZARD QUOTIENTS[a]
POTENTIAL FUTURE RESIDENTIAL SCENARIO
SHALLOW WELL GROUNDWATER INGESTION PATHWAY
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Endpoint/COC	Receptor		
	RME Adult	RME Child	Average Adult
Altered Blood Chemistry			
Chromium	1	2	0.7
Total HI:	**1**	**2**	**0.7**
Blood Pressure Increase			
Barium	2	4	1
Total HI:	**2**	**4**	**1**
Cardiovascular Effects			
Arsenic	8	17	5
Cadmium	1	3	0.8
Total HI:	**9**	**19**	**6**
Developmental Effects			
Cadmium	1	3	0.8
Mercury	2	3	1
Vanadium	0.4	0.9	0.3
Total HI:	**3**	**7**	**2**
Gastrointestinal Effects			
Arsenic	8	17	5
Chromium	1	2	0.7
Copper	0.6	1	0.4
Total HI:	**9**	**20**	**7**
Kidney Effects			
Cadmium	1	3	0.8
Mercury	2	3	1
Total HI:	**3**	**6**	**2**
Liver Effects			
Selenium	0.3	0.6	0.2
Total HI:	**0.3**	**0.6**	**0.2**

Key at end of table.

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Table S.6-6

SEGREGATION OF HAZARD QUOTIENTS[a]
POTENTIAL FUTURE RESIDENTIAL SCENARIO
SHALLOW WELL GROUNDWATER INGESTION PATHWAY
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Endpoint/COC	Receptor		
	RME Adult	RME Child	Average Adult
Neurological Effects			
Arsenic	8	17	5
Manganese	0.4	0.8	0.3
Mercury	2	3	1
Total HI:	**10**	**21**	**7**
Selenosis			
Selenium	0.3	0.6	0.2
Total HI:	**0.3**	**0.6**	**0.2**
Skin Effects			
Arsenic	8	17	5
Total HI:	**8**	**17**	**1**

[a] Hazard quotients segregated for all COPCs with hazard indices greater than 0.5 in the RME child evaluation values presented as one significant figure; total HIs may not reflect the sum of individually presented hazard quotients because of rounding.

Key:

COPCs = Contaminants of potential concern.
HI = Hazard index.
RME = Reasonable maximum exposure.

Source: Ecology and Environment, Inc., 1994.

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Table S.6-7

ENVIRONMENTAL LEAD CONCENTRATIONS AND IEUBK MODELING RESULTS STUDY GROUP RESIDENCES HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL NEW ORLEANS, LOUISIANA

	Input Parameters				Modeling Results
Location	Sieved Soil [a] (mg/kg)	Water [b] (µg/L)	Water [c] (µg/L)	Dust [d] (mg/kg)	Probability Above 10 µg/dL [e]
SG-001	302.3	1.5	1.5	402	**9.36**
SG-002	118.9	1.5	1.5	108	0.31
SG-003	36.4	1.5	1.5	330	1.76
SG-004	615.4	5.3	1.5	876	**40.37**
SG-005	165.7	17	1.5	71.7	0.97
SG-006	92.6	1.5	1.5	125	0.28
SG-007	245.8	1.5	1.5	200	2.39
SG-008	343.3	7.5	1.5	283	**7.28**
SG-009	176.3	1.5	1.5	217	1.76
SG-010	228.7	3.4	1.5	145	1.47
SG-011	292.1	3.1	1.5	53.9	1.03
SG-012	147.2	7.2	5.4	213	2.11
SG-013	671.3	10	3	198	**15.45**
SG-014	633.0	7.1	3.1	212	**13.64**
SG-015	74.4	5.8	6.6	158	0.69
SG-016	634.6	8.5	7.6	32.3	**8.25**
SG-017	195.7	5.9	4	20.0	0.37
SG-018	265.3	3.5	4.6	28.2	0.73
SG-019	1045.7	6.5	4	14.9	**19.81**
SG-020	694.3	1.5	4.5	212	**14.52**
SG-021	643.5	9.8	1.5	16.0	**7.28**
SG-022	239.7	3.4	3.6	48.3	0.69
SG-023	93.0	5.9	5.3	9.0	0.07
SG-024	698.3	5.3	3.7	33.1	**8.79**
SG-025	719.3	6	1.5	35.6	**9.36**
SG-027	456.7	4.1	4.7	36.3	3.05
SG-028	420.8	1.5	6.5	22.4	2.11
SG-029	281.7	3.5	4.8	79.0	1.39
SG-030	161.0	1.5	4.8	7.70	0.13
SG-031	921.0	6	3.5	33.1	**15.45**
SG-032	369.3	3.4	4	0.6	1.23
SG-033	639.7	5.3	5.4	0.25	**6.42**
SG-034	466.0	6	1.5	0.38	2.54

Key:

IEUBK = Integrated Expanded Uptake Biokinetic Model
mg/kg = milligrams per kilogram
µg/dL = micrograms per deciliter
"---" = Sample unavailable.

(a) Average of concentrations in sieved (250 µ) surface soil samples collected from front yard, back yard, drip line, play area and garden.
(b) Concentration detected in first draw sample.
(c) Concentration detected in three minute purge sample.
(d) Average of concentrations detected in dust samples collected from the entrance, bedroom, and living room.
(e) Probability that an individual child living at the specified residence would have a blood lead level (PbB) greater than 10 µg/dL.

Source: Ecology and Environment, Inc., 1994

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Table S.6-8

ENVIRONMENTAL LEAD CONCENTRATIONS AND IEUBK MODELING RESULTS BACKGROUND RESIDENCES HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL NEW ORLEANS, LOUISIANA

Location	Input Parameters				Modeling Results
	Sieved Soil [a] (mg/kg)	Water [b] (µg/L)	Water [c] (µg/L)	Dust [d] (mg/kg)	% Above 10 µg/dL [e]
SG-026	80.3	6	1.5	13.4	0.05
SG-035	6.4	12	6.1	28.3	0.06
SG-036	997	3.4	3.1	170	23.80
SG-037	45.4	4.4	1.5	2.8	0.01
SG-038	86.7	3.6	1.5	38.0	0.07

Key:

IEUBK = Integrated Expanded Uptake Biokinetic Model
mg/kg = milligrams per kilogram
µg/dL = micrograms per deciliter
µg/l = micrograms per liter
"---" = Sample unavailable.

(a) Average of concentrations in sieved (250 µ) surface soil samples collected from front yard, back yard, drip line, play area, and ga
(b) Concentration detected in first draw sample.
(c) Concentration detected in three minute purge sample.
(d) Average of concentrations detected in dust samples collected from the entrance, bedroom, and living room.
(e) Probability that an individual child living at the specified residence would have a blood lead level (PbB) greater than 10 µg/dL.

Source: Ecology and Environment, Inc., 1994

Table S.6-9

ENVIRONMENTAL LEAD CONCENTRATIONS AND IEUBK MODELING RESULTS UNDEVELOPED LANDFILL AREA *HUMAN HEALTH RISK ASSESSMENT* AGRICULTURE STREET LANDFILL NEW ORLEANS, LOUISIANA

Location	Surface Soil [a] (mg/kg)	Probability Above 10 µg/dL [b]
AL-GL001-SS-01	37.6	0.55
AL-GL002-SS-01	110	1.03
AL-GL003-SS-01	408	**6.03**
AL-GL004-SS-01	148	1.39
AL-GL005-SS-01	1795	**52.78**
AL-GL006-SS-01	185	1.87
AL-GL007-SS-01	110	1.03
AL-GL008-SS-01	2167	**61.13**
AL-GL009-SS-01	28307	**99.91**
AL-GL010-SS-01	1917	**55.50**
AL-GL011-SS-01	1556	**45.07**
AL-GL012-SS-01	3558	**81.13**
AL-GL013-SS-01	3394	**81.13**
AL-GL014-SS-01	2600	**69.83**
AL-GL021-SS-01	3068	**75.59**
AL-GL022-SS-01	2005	**58.29**
AL-GL023-SS-01	84.8	0.82
AL-GL028-SS-01	1334	**38.16**
AL-GL029-SS-01	131	1.23
AL-GL030-SS-01	1075	**28.52**
AL-GL035-SS-01	616	**12.03**
AL-GL036-SS-01	843	**19.81**
AL-GL037-SS-01	754	**16.45**
AL-GL038-SS-01	2290	**64.01**
AL-GL040-SS-01	3965	**86.23**
AL-GL043-SS-01	402	**5.67**
AL-GL044-SS-01	905	**21.06**
AL-GL045-SS-01	1759	**50.13**
AL-GL046-SS-01	2592	**69.83**
AL-GL047-SS-01	672	**13.64**
AL-GL053-SS-01	2375	**64.01**
AL-GL054-SS-01	90.1	0.87
AL-GL055-SS-01	1305	**36.05**
AL-GL061-SS-01	3865	**83.75**
AL-GL062-SS-01	195	1.99
AL-GL063-SS-01	1824	**52.78**
AL-GL069-SS-01	3883	**83.75**
AL-GL070-SS-01	2485	**66.92**
AL-GL071-SS-01	392	**5.32**
AL-GL072-SS-01	164	1.56
AL-GL078-SS-01	1555	**45.07**
AL-GL079-SS-01	3607	**81.13**
AL-GL080-SS-01	304	3.67
AL-GL086-SS-01	1775	**50.13**
AL-GL087-SS-01	3251	**78.40**
AL-GL088-SS-01	276	3.24
AL-GL089-SS-01	60.9	0.69
AL-GL090-SS-01	187	1.87
AL-GL095-SS-01	290	3.45
AL-GL096-SS-01	261	2.87
AL-GL097-SS-01	1553	**45.07**

Key:

IEUBK = Integrated Expanded Uptake Biokinetic Model
mg/kg = milligrams per kilogram
µg/dL = micrograms per deciliter

(a) Results of grid samples collected from the undeveloped area.
(b) Probability that an individual child living at the specified residence would have a blood lead level (PbB) greater than 10 µg/dL. Average of all samples equals 36.6 %.

Source: Ecology and Environment, Inc., 1994

Table S.6-10

CONTAMINANTS OF POTENTIAL CONCERN
CURRENT RESIDENTIAL SCENARIO
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA

Carcinogenic Effects	Noncancer Effects
Soil	
Arsenic Polynuclear aromatic hydrocarbons (PAHs) 2,3,7,8-TCDD (equivalent)	Lead
Air	
Benzene Chloroform Chloromethane 1,1-Dichloroethene 1,4-Dichlorobenzene	None
Produce	
None	Cadmium Diazinon

Source: Ecology and Environment, Inc., 1994

Table S.6-11

**CONTAMINANTS OF POTENTIAL CONCERN
FUTURE RESIDENTIAL SCENARIO ASSUMING FUTURE DOMESTIC GROUNDWATER USE
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL SITE
NEW ORLEANS, LOUISIANA**

Carcinogenic Effects	Noncancer Effects
Soil	
Arsenic Polynuclear aromatic hydrocarbons 2,3,7,8-TCDD (equivalent)	Arsenic Lead
Groundwater (shallow)	
Arsenic Beryllium Polynuclear aromatic hydrocarbons	Arsenic Barium Cadmium Chromium Copper Mercury Zinc
Groundwater (deep)	
4,4'-DDT	Selenium

Key:

2,3,7,8-TCDD = Tetrachlorodibenzo-p-dioxin.
4,4'-DDT = Dichloro-diphenyl-trichloroethane.

Source: Ecology and Environment, Inc., 1994

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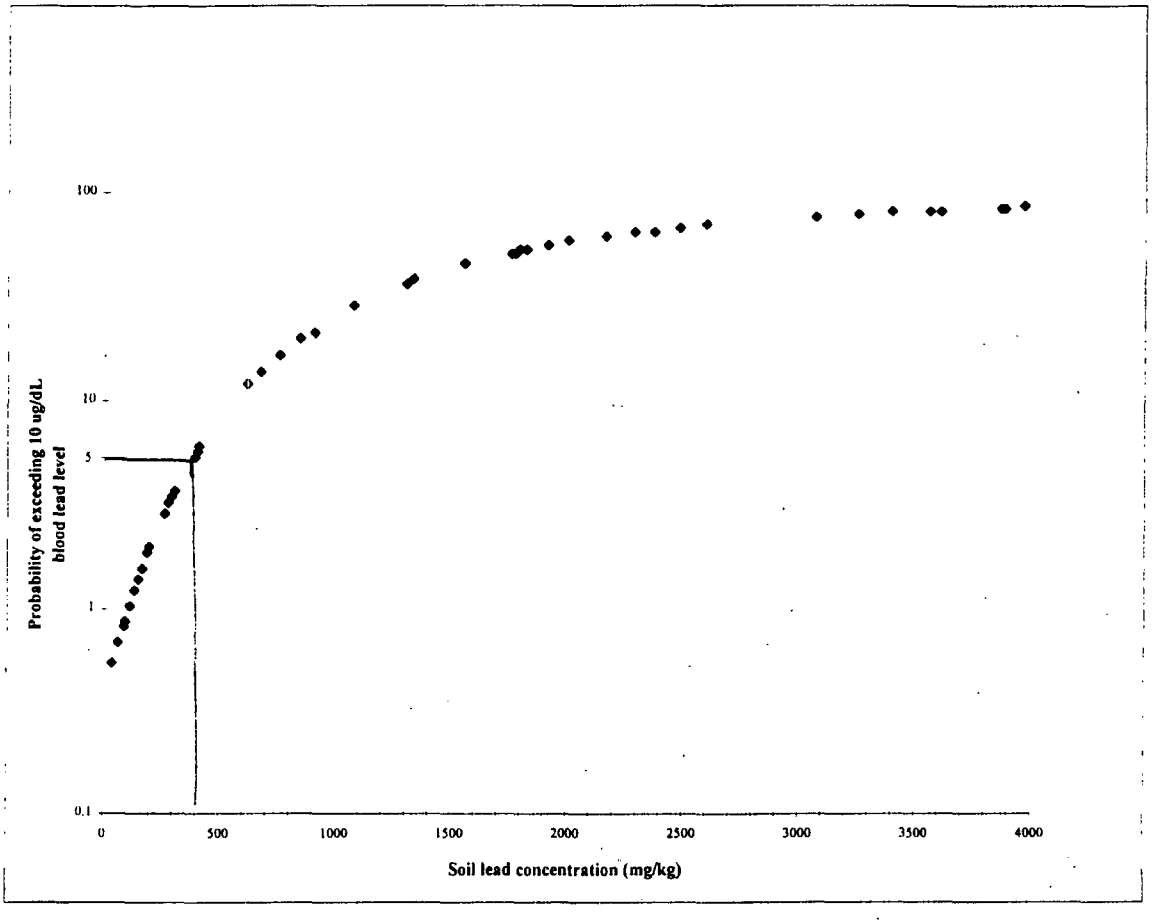

Figure S.6-1 SOIL LEAD CONCENTRATIONS AND ASSOCIATED BLOOD LEAD LEVELS UNDEVELOPED LANDFILL AREA, HUMAN HEALTH RISK ASSESSMENT AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA

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S.7 CONCLUSIONS

The baseline HHRA results are the product of numerous, extremely conservative and, therefore, health protective assumptions regarding the potential for exposure to site-related contaminants and toxicity of the COPCs. Consequently, the cancer and noncancer risk estimates derived in this baseline HHRA are upper-bound estimates and are likely overestimates of the actual risks posed to either current or future residents at the ASL site. These assumptions are discussed in detail in the uncertainties sections of this document.

Risk results compared to the following regulatory benchmarks established by EPA include:

- For carcinogens, excess lifetime cancer risks less than 1×10^{-6} are considered insignificant. EPA defines the acceptable risk range as 1×10^{-6} to 1×10^{-4}. Consequently, EPA considers that under most circumstances, sites that exhibit cancer risks greater than 1×10^{-4} should be remediated, but cleanup can be warranted at lower risk levels when site-specific conditions dictate (EPA 1992g);

- For assessing noncarcinogenic effects, HIs greater than 1 indicate that adverse health effects that may be associated with exposure. However, considerable uncertainty is associated with the HI estimate and an HI greater than 1 does not necessarily mean proportionally greater risk, nor does it trigger remediation (EPA 1988c); and

- For lead, the regulatory benchmark is defined as no more than 5% of neighborhood children exceeding a blood lead level of 10 μg/dL (EPA 1994d). Lead evaluation is appropriate only for estimating potential adverse health effects to infants and young children in

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residential settings; the methodology, however, is inappropriate for adults (workers, trespassers, and adult residents) or older children (i.e., those who visit Press Park Community Center or attend Moton School).

S.7.1 SUMMARY OF THE BASELINE HUMAN HEALTH RISK ASSESSMENT RESULTS

S.7.1.1 Current Exposure Scenarios

With the exception of the trespasser scenario, which was based on exposure at the undeveloped area of the ASL site, all current scenarios and receptors were assumed to be exposed to environmental media in the developed area. The cancer and noncancer risk estimates reflect extremely conservative assumptions concerning current land use and potential exposures.

S.7.1.1.1 Residents

The total excess lifetime RME cancer risk estimate for individuals living at the SGRs was 8×10^{-4}. The vast majority of the risk was due to inhalation of chloroform in indoor air. As discussed in Section S.6.5, it is unlikely that the relatively high chloroform concentrations detected in SGR air reflect site-related contamination. Risks associated with soil ingestion (1×10^{-4}) and dermal contact (3×10^{-5}) were within EPA's acceptable risk range (EPA 1992g). Risks associated with ingestion of homegrown produce were less than 1×10^{-6}.

HIs for children and adults living at the SGRs were 5 and 2, respectively. Most of the noncancer risk was due to consumption of diazinon in homegrown produce, although inhalation of 1,4-dichlorobenzene in indoor air also contributed to the risk. Soil ingestion, dermal contact, and outdoor air inhalation pathways yielded HIs of less than one.

In the lead evaluation, 6.1% of children living in the neighborhood that includes the SGRs were predicted to have blood lead levels greater than 10 μg/dL using average soil, dust, paint, and tap water values. Therefore, EPA's criterion of 5% was marginally exceeded using average values. Thirteen individual residences included in the study had a greater than 5% probability of exceeding the 10 μg/dL standard.

S.7.1.1.2 Workers

The total excess lifetime cancer risk posed to workers in the vicinity of the SGRs was 2×10^{-4}. The majority of this risk estimate was due to inhalation; the principal COPC was chloroform. The estimated cancer risk estimate is within EPA's acceptable risk range. None of the HIs associated with potential worker exposure exceeded EPA's regulatory benchmark of unity (1).

S.7.1.1.3 Trespassers

The total excess lifetime cancer risk associated with trespassing on the undeveloped area was 2×10^{-5}; the main COPCs were arsenic and 2,3,7,8-TCDD (equivalents) in soil. The estimated cancer risk estimate is within EPA's acceptable risk range. None of the HIs associated with trespassing exceeded EPA's regulatory benchmark of unity (1).

S.7.1.1.4 Children at Press Park Community Center

The total excess lifetime cancer risks posed to children visiting Press Park Community Center was estimated at 3×10^{-5}. This risk estimate reflected ingestion and dermal contact with soil containing arsenic and 2,3,7,8-TCDD (equivalents). The estimated cancer risk estimate is within EPA's acceptable risk range. The HI associated with potential childhood exposure at Press Park Community Center is equivalent to one.

S.7.1.1.5 Children at Moton Elementary School

The total excess lifetime cancer risk posed to children attending Moton School was 2×10^{-5}; most of this risk estimate was attributable to inhalation of benzene and chloroform in indoor and outdoor air. However, as discussed above and in Section S.6.5, it is unlikely that the relatively high VOC concentrations detected in Moton School indoor air reflect site-related contamination. None of the HIs associated with potential childhood exposure at Moton School exceeded EPA's regulatory benchmark of unity (1).

S.7.1.2 Future Exposure Scenarios

All potential future exposures were assumed to occur in the undeveloped area. The future risk estimates reflect extremely conservative assumptions regarding hypothetical future land use and exposures at the undeveloped area. For example, groundwater beneath the ASL site was assumed to be used as a residential water supply in the future. Disturbance of soil due to excavation and construction was assumed in the future scenarios. Risks associated with future exposures at the developed area would be expected to be equivalent to those generated for the current scenarios (i.e., exposures and risks at the developed area would not likely change in the future).

S.7.1.2.1 Residents

Most of the cancer and noncancer risks resulted from hypothetical use of groundwater beneath the ASL site. Risks were evaluated for exposure to the shallow zone and deep (sand unit) groundwater. However, it is extremely unlikely that this groundwater would ever be used because this water is not potable and ASL residents currently derive their tap water from the Mississippi River (Jaynes 1994).

The assumption that future residents would derive their domestic water from shallow or deep wells resulted in total excess lifetime cancer risk estimates of 3×10^{-3} or 3×10^{-4}, respectively. Arsenic was the main COPC in groundwater. Incidental ingestion of undeveloped area soils yielded a 2×10^{-4} RME cancer risk estimate; arsenic and 2,3,7,8-TCDD (equivalents) were the major risk drivers.

The assumption that children derive their domestic water from shallow or deep wells resulted in total HIs of 40 and 6, respectively (the adult HIs were 17 and 2, respectively). Groundwater exposure pathways were responsible for most of the total future residential risk (mainly because of arsenic). HIs associated with ingestion of groundwater from the shallow wells subsequently were segregated according to target organ or system; the highest HIs (21 and 10 for children and adults, respectively) were for neurological effects (Table S.6-6). Childhood ingestion of soil also yielded an HI greater than 1; the HI of 4 reflected exposure to several metals, the most significant of which was arsenic.

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In the lead evaluation, hypothetical children residing at 35 of 50 sample locations on the undeveloped area were predicted to have blood lead levels greater than 10 μg/dL. EPA's criterion of 5% was exceeded because of relatively high lead concentrations in soil.

S.7.1.2.2 Workers

The total excess lifetime cancer risk posed to workers who could be exposed to soil and outdoor air at the undeveloped area was 5×10^{-5}. The vast majority of this risk estimate was due to soil ingestion and dermal contact; the main COPCs were arsenic and 2,3,7,8-TCDD (equivalents). The estimated cancer risk estimate is within EPA's acceptable risk range. None of the HIs associated with potential future worker exposure exceeded EPA's regulatory benchmark of 1.

S.7.1.2.3 Trespassers

The total excess lifetime cancer risk associated with trespassing on the undeveloped area in the future was 2×10^{-5}; the main COPCs were arsenic, 2,3,7,8-TCDD (equivalents) in soil. The estimated cancer risk estimate is within EPA's acceptable risk range. None of the HIs associated with trespassing exceeded EPA's regulatory benchmark of 1.

S.7.2 SUMMARY

Under current land use conditions, residential, and worker scenarios yielded excess lifetime cancer risks in excess of regulatory benchmarks. Regulatory benchmarks for HIs were only exceeded in the residential scenario. Cancer risks were primarily due to chloroform in indoor and outdoor air. However, significant uncertainty is associated with the risk estimate for inhalation of chloroform in indoor air. Chloroform is associated with the chlorination of drinking water, municipal sewage, auto exhaust, fluorocarbon refrigerants, and dry cleaning agents (Howard 1990, Verschueren 1983).

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For future land use, only the residential scenario yielded excess lifetime cancer risks and noncancer HIs in excess of regulatory benchmarks. However, in the future land-use scenario, it is highly unlikely that residents would be exposed to site-related contaminants in groundwater. The lead evaluation revealed the potential for significant risks to young children if residential development were to occur on the undeveloped area.

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ATTACHMENT S.A

EXPOSURE POINT CONCENTRATIONS

Table S.A-1

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
INORGANIC CHEMICALS
DEVELOPED AREA GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
Aluminum	52	1857	10318	4318	1665	4746	4746
Antimony	45	1.5	15.0	4.9	3.2	5.8	5.8
Arsenic	52	1.2	37	9.3	6.6	11	11
Barium	52	50	814	222	144	264	264
Beryllium	52	0.07	0.50	0.19	0.13	0.23	0.23
Cadmium	52	0.14	9.1	1.6	1.8	2.5	2.5
Calcium	52	1484	60921	7634	9734	8534	(b)
Chromium	52	4.6	79	19	13	22	(b)
Cobalt	52	2.5	12	6.5	2.2	7.1	7.1
Copper	52	4.9	1124	117	176	198	198
Cyanide	52	0.08	1.9	0.49	0.35	0.63	0.63
Iron	52	5100	65877	22239	14853	27028	27028
Lead	52	12	1974	314	328	634	634
Magnesium	52	908	3363	1908	702	2108	(b)
Manganese	52	75	680	254	125	292	(b)
Mercury	52	0.03	1.5	0.41	0.33	0.6	0.63
Nickel	52	7.8	60	21	10	24	24
Potassium	52	271	1787	767	303	851	(b)
Selenium	48	0.10	0.68	0.25	0.14	0.30	(b)
Silver	52	0.14	113	3.5	16	3.2	3.2
Sodium	52	9.3	1158	112	178	148	(b)
Thallium	43	0.20	1.1	0.36	0.18	0.40	0.40
Vanadium	52	7.8	25	14	4.6	16	16
Zinc	52	29	1832	436	401	689	(b)

(a) 95% UCL = 95% Upper Confidence Limit of the mean.
(b) Not evaluated; maximum on-site concentration less than Recommended Daily Allowance (See S.3.2)

Source: Ecology and Environment, Inc., 1994.

Table S-A.2

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
ORGANIC CHEMICALS
DEVELOPED AREA GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (µg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	52	1.0	6.0	5.2	1.9	6.0	6.0
1,1-DICHLOROETHENE	49	2.0	5.8	5.2	1.3	5.8	5.8
1,2-DICHLOROETHENE (total)	52	1.0	6.0	5.2	1.3	6.0	6.0
2-METHYLNAPHTHALENE	52	19.0	232	166	63	232	232
4,4'-DDD	47	1.7	6.2	5.5	8.7	6.2	6.2
4,4'-DDE	47	1.7	23	16	28	23	23
4,4'-DDT	47	1.7	37	22.0	27	37	37
ACENAPHTHENE	52	0.6	309	184	65	309	309
ACENAPHTHYLENE	52	18	222	175	49	222	222
ACETONE	52	5.0	9.2	8.4	5.6	9.2	9.2
ALDRIN	47	0.9	1.2	1.1	0.6	1.2	1.2
ALPHA-CHLORDANE	47	0.9	127	78.6	254	127	127
ANTHRACENE	52	16	201	144	183	201	201
AROCLOR-1260	47	14	45.5	41.5	58	46	46
BENZO(a)ANTHRACENE	52	41	337	306	636	337	337
BENZO(a)PYRENE	52	23	365	327	715	365	365
BENZO(b)FLUORANTHENE	51	20	514	411	670	514	514
BENZO(g,h,i)PERYLENE	52	36	303	263	429	303	303
BENZO(k)FLUORANTHENE	52	30	308	302	662	308	308
BUTYLBENZYLPHTHALATE	52	18	252	178	206	252	252
CARBAZOLE	52	20	225	158	140	225	225
CHRYSENE	52	23	415	358	788	415	415
DI-N-BUTYLPHTHALATE	52	18	272	200	387	272	272
DI-N-OCTYLPHTHALATE	52	20	175	125	86	175	175
DIBENZ(a,h)ANTHRACENE	52	64	193	183	29	193	193
DIBENZOFURAN	52	19	214	179	41	214	214
DIELDRIN	47	1.7	8.8	6.9	9.2	8.8	8.8
ENDOSULFAN-II	47	1.7	2.8	2.6	2.6	2.8	2.8
ENDRIN	47	1.7	12	11	31	12	11.7
ENDRIN-ALDEHYDE	47	1.7	29	18	31	29	29
FLUORANTHENE	52	22	636	571	1531	636	636
FLUORENE	52	19	218	178	63	218	218
GAMMA-CHLORDANE	47	0.9	119	67	215	119	119
HEPTACHLOR	45	0.9	3.6	3.4	7.3	3.6	3.6
HEPTACHLOR-EPOXIDE	47	0.9	12.0	12	38	12	12
INDENO(1,2,3-cd)PYRENE	52	31	272	235	398	272	272
METHOXYCHLOR	47	0.9	13.4	12	8.5	13	13
METHYLENE-CHLORIDE	52	2.0	8.5	7.4	4.6	8.5	8.5
NAPTHALENE	52	22	212	156	66	212	212
PHENANTHRENE	52	25	309	291	764	309	309
PYRENE	52	21	577	521	1381	577	577
TETRACHLOROETHENE	52	2.0	5.8	5.4	1.1	5.8	5.8
TOLUENE	52	1.0	7.8	6.2	4.5	7.8	7.8
XYLENE	52	3.0	5.8	5.5	0.8	5.8	5.8
beta-BHC	47	0.9	1.3	1.2	0.9	1.3	1.3
bis(2-ETHYLHEXYL)PHTHALATE	42	60	1792	1079	1474.2	1792	1792
delta-BHC	47	0.9	1.5	1.5	3.1	1.5	1.5

(a) 95% UCL = 95% Upper Confidence Limit of the mean.

Source: Ecology and Environment, Inc., 1994.

Table S.A-3

EXPOSURE POINT CONCENTRATIONS
COMBINED SUBSURFACE AND SURFACE SOIL
INORGANIC CHEMICALS
DEVELOPED AREA GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
ALUMINUM	255	1623	10119	5765	2804	5767	5767
ANTIMONY	218	1.4	53.8	9.3	17.9	8.5	8.5
ARSENIC	255	1.2	65	16.8	15.7	17	17
BARIUM	255	28	2659	420	396	428	428
BERYLLIUM	255	0.07	0.50	0.30	0.18	0.31	0.31
CADMIUM	254	0.14	26	3.6	4.5	4.0	4.0
CALCIUM	255	1343	48665	15526	16946	15229	15229
CHROMIUM	255	3.6	161	38.5	42.4	38	38
COBALT	255	1.7	29.5	10.3	6.0	10	10
COPPER	255	1.1	6147	293	531	371	371
CYANIDE	254	0.08	5.9	0.98	1.23	0.92	0.92
IRON	255	3777	199419	51423	51264	52861	52861
LEAD	255	7	3160	820	945	1197	1197
MAGNESIUM	255	594	3762	2355	894	2366	2366
MANGANESE	255	52	1565	439	333	441	441
MERCURY	255	0.03	3.8	0.86	0.94	1.0	1.0
NICKEL	255	5.7	519	37	39	36	36
POTASSIUM	255	243	1781	921	529	923	923
SELENIUM	247	0.09	0.87	0.43	0.41	0.43	0.43
SILVER	255	0.14	48	4.5	11	4.0	4.0
SODIUM	255	9.28	638	233	224	243	243
THALLIUM	239	0.12	6	1	0.8	0.55	0.55
VANADIUM	255	0.50	46	18	11	18	18
ZINC	255	20	5116	1009	1094	1210	1210

(a) 95% UCL = 95% Upper Confidence Limit of the mean.
(b) Not evaluated; maximum on-site concentration less than Recommended Daily Allowance (See S.3.2)

Source: Ecology and Environment, Inc., 1994.

Table S.A-4

EXPOSURE POINT CONCENTRATIONS
COMBINED SUBSURFACE AND SURFACE SOIL
ORGANIC CHEMICALS
DEVELOPED AREA GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (µg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	127	0.0010	0.020	0.006	0.002	0.006	0.006
1,1-DICHLOROETHENE	127	0.0010	0.012	0.006	0.002	0.006	0.006
1,2-DICHLOROETHENE (total)	127	0.0010	0.012	0.006	0.002	0.006	0.006
1,4-DICHLOROBENZENE	127	0.0240	150	1.746	13.290	0.324	0.324
2-BUTANONE	127	0.0050	0.160	0.014	0.026	0.010	0.010
2-METHYLNAPHTHALENE	127	0.0190	510	5.692	45.410	0.357	0.357
4,4'-DDD	127	0.0009	0.390	0.036	0.089	0.028	0.028
4,4'-DDE	127	0.0017	0.180	0.039	0.053	0.048	0.048
4,4'-DDT	127	0.0004	0.200	0.044	0.139	0.034	0.034
ACENAPHTHENE	127	0.0006	99	1.640	9.466	0.372	0.372
ACENAPHTHYLENE	127	0.0180	260	2.789	23.053	0.304	0.304
ACETONE	125	0.0050	0.460	0.042	0.082	0.029	0.029
ALDRIN	127	0.0005	0.036	0.004	0.007	0.003	0.003
alpha-BHC	127	0.0001	0.021	0.002	0.002	0.001	0.001
ALPHA-CHLORDANE	127	0.0009	1.700	0.092	0.263	0.069	0.069
ANTHRACENE	127	0.0160	390	5.355	36.109	0.450	0.450
AROCLOR-1260	127	0.0140	0.440	0.087	0.103	0.079	0.079
BENZO(a)ANTHRACENE	127	0.0390	370	5.804	34.675	1.245	1.245
BENZO(a)PYRENE	127	0.0230	270	4.732	26.462	1.205	1.205
BENZO(b)FLUORANTHENE	126	0.0200	320	5.472	30.640	1.508	1.508
BENZO(g,h,i)PERYLENE	126	0.0240	110	2.586	12.685	0.861	0.861
BENZO(k)FLUORANTHENE	127	0.0300	410	5.071	36.415	1.032	1.032
bis(2-ETHYLHEXYL)PHTHALATE	97	0.0510	150	3.176	15.267	1.696	1.696
BUTYLBENZYLPHTHALATE	127	0.0180	150	1.763	13.291	0.400	0.400
CARBAZOLE	127	0.0200	120	1.494	10.646	0.333	0.333
CARBON-DISULFIDE	127	0.0010	0.012	0.006	0.002	0.006	0.006
CARBON-TETRACHLORIDE	127	0.0020	0.020	0.006	0.002	0.006	0.006
CHLOROFORM	126	0.0010	0.012	0.006	0.002	0.006	0.006
CHRYSENE	127	0.0230	270	4.802	26.468	1.255	1.255
delta-BHC	127	0.0005	0.025	0.003	0.004	0.002	0.002
DI-N-BUTYLPHTHALATE	126	0.0180	150	1.694	13.347	0.273	0.273
DI-N-OCTYLPHTHALATE	127	0.0200	150	1.781	13.293	0.397	0.397
DIBENZ(a,h)ANTHRACENE	127	0.0360	42	1.001	4.590	0.362	0.362
DIBENZOFURAN	127	0.0190	350	3.734	31.036	0.352	0.352
DIELDRIN	127	0.0005	0.070	0.012	0.014	0.012	0.012
DIETHYLPHTHALATE	127	0.0220	150	1.753	13.290	0.338	0.338
ENDOSULFAN-II	127	0.0007	0.072	0.007	0.010	0.006	0.006
ENDOSULFAN-SULFATE	127	0.0002	0.220	0.006	0.021	0.004	0.004
ENDRIN	127	0.0017	0.256	0.019	0.038	0.015	0.015
ENDRIN-ALDEHYDE	127	0.0005	0.070	0.014	0.025	0.014	0.014
ENDRIN-KETONE	127	0.0004	0.220	0.006	0.020	0.004	0.004
ETHYLBENZENE	127	0.0010	0.044	0.007	0.004	0.007	0.007
FLUORANTHENE	127	0.0220	810	11.957	75.017	2.113	2.113
FLUORENE	127	0.0190	440	5.112	39.288	0.372	0.372
GAMMA-CHLORDANE	127	0.0009	1.700	0.088	0.255	0.070	0.070
HEPTACHLOR	125	0.0006	0.043	0.004	0.006	0.003	0.003
HEPTACHLOR-EPOXIDE	127	0.0004	0.084	0.015	0.040	0.011	0.011
INDENO(1,2,3-cd)PYRENE	126	0.0220	120	2.290	11.770	0.767	0.767
METHOXYCHLOR	127	0.0009	0.205	0.021	0.028	0.018	0.018
METHYLENE-CHLORIDE	121	0.0010	0.070	0.019	0.015	0.020	0.020
NAPTHALENE	127	0.0210	2300	23.712	204.183	0.408	0.408
PHENANTHRENE	127	0.0250	1400	18.511	128.649	1.321	1.321
PYRENE	127	0.0210	700	11.673	69.545	1.898	1.898
TETRACHLOROETHENE	127	0.0020	0.130	0.011	0.015	0.010	0.010
TOLUENE	127	0.0010	0.110	0.010	0.013	0.010	0.010
TRICHLOROETHENE	127	0.0010	0.020	0.006	0.002	0.006	0.006
XYLENE	127	0.0030	0.220	0.014	0.023	0.011	0.011

(a) 95% UCL = 95% Upper Confidence Limit of the mean.

Source: Ecology and Environment, Inc., 1994.

Table S.A-5

EXPOSURE POINT CONCENTRATIONS
INDOOR AIR VOCS
STUDY GROUP RESIDENCES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration ($\mu g/m^3$)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	33	0.10	40	5.28	8.9	21.7	22
1,1-DICHLOROETHENE	33	0.10	1.4	0.14	0.23	0.14	0.14
1,2,4-TRICHLOROBENZENE	33	0.10	4.2	0.22	0.71	0.18	0.18
1,2,4-TRIMETHYLBENZENE	33	0.10	60	9.93	16.2	23.4	23.4
1,2-DICHLOROBENZENE	33	0.10	1.58	0.14	0.26	0.14	0.14
1,3,5-TRIMETHYLBENZENE	33	0.10	19	2.76	4.9	12.3	12.3
1,3-DICHLOROBENZENE	33	0.10	5932	180	1033	3.0	3.0
1,4-DICHLOROBENZENE	33	0.10	3754	142	654	1127.8	1128
BENZENE	33	1.3	35	7.40	7.9	9.9	9.9
CHLOROBENZENE	33	0.10	4.15	0.22	0.70	0.17	0.17
CHLOROETHANE	33	0.10	0.92	0.15	0.19	0.16	0.16
CHLOROFORM	33	0.10	583	21	101	49.6	50
CHLOROMETHANE	33	0.10	5.39	0.94	1.0	1.7	1.7
ETHYLBENZENE	33	0.10	29	5.22	6.9	15.8	15.8
FREON 11	33	0.10	30	5.93	5.5	12.3	12.3
FREON 12	33	0.10	22	4.29	4.5	9.6	9.6
M,P-XYLENE	33	0.10	91	15	18.6	29.1	29.1
METHANE	33	0.10	24	1.82	4.8	3.1	3.1
METHYLENE CHLORIDE	33	0.10	6.85	0.46	1.3	0.44	0.44
O-XYLENE	33	0.10	37	5.44	7.1	13.8	13.8
STYRENE	33	0.10	17	2.01	3.2	6.5	6.5
TETRACHLOROETHENE	33	0.10	42	3.12	9.3	5.2	5.2
TOLUENE	33	1.62	119	28	29	51	50.8
TRICHLOROETHENE	33	0.10	5.4	0.35	1.0	0.27	0.27

(a) 95% UCL = 95% Upper Confidence Limit of the mean.

Source: Ecology and Environment, Inc., 1994.

Table S.A-6

EXPOSURE POINT CONCENTRATIONS
OUTDOOR AIR VOCS
STUDY GROUP RESIDENCES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration ($\mu g/m^3$)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	33	0.10	20	1.4	3.8	2.1	2.1
1,2,4-TRIMETHYLBENZENE	33	0.10	40	2.5	6.8	6.0	6.0
1,4-DICHLOROBENZENE	33	0.10	49	4.1	12	8.2	8.2
BENZENE	33	0.1	232	11.0	39.9	12.8	12.8
CHLOROFORM	5	1.38	411.7	85	183	21.2 (b)	21.2
CHLOROMETHANE	33	0.10	2.0	0.71	0.4	1.0	1.0
ETHYLBENZENE	33	0.10	20.1	3.5	4.9	20.6	20.1
FREON 11	33	0.10	730	25.1	126.6	10.5	10.5
FREON 12	33	0.10	18	3.3	2.7	4.5	4.5
M,P-XYLENE	33	1.72	50	8.7	13.3	11.2	11.2
O-XYLENE	33	0.10	10	1.96	2.3	3.9	3.9
TOLUENE	33	1.92	49	6.2	7.9	7.0	7.0
TRICHLOROETHENE	4	1.69	3.9	2.6	0.9	3.9	3.9

(a) 95% UCL = 95% Upper Confidence Limit of the mean.
(b) Value calulated by Uncensor (See S.4.4.1)

Source: Ecology and Environment, Inc., 1994.

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Table S.A-7

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
INORGANIC CHEMICALS
MOTON ELEMENTARY SCHOOL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
ALUMINUM	9	1959	8627	4510	2105	6701	6701
ANTIMONY	9	2.1	5.9	2.8	1.2	3.5	3.5
ARSENIC	9	1.6	7.70	3.6	2.0	5.5	5.5
BARIUM	9	50	126	76	27	97	97
BERYLLIUM	9	0.08	0.33	0.18	0.09	0.31	0.31
CADMIUM	9	0.15	0.46	0.3	0.1	0.4	0.44
CALCIUM	9	3750	122786	17941	39348	52195	(b)
CHROMIUM	9	4.4	13	8.5	2.6	11	(b)
COBALT	9	2.7	8.2	5.2	1.6	6.7	6.7
COPPER	9	2.2	14	7.1	4.2	14	14
CYANIDE	9	0.08	5.9	0.81	1.91	3.82	3.8
IRON	9	3777	13809	8346	2930	11263	11263
MAGNESIUM	9	1990	4171	2946	625	3416	(b)
MANGANESE	9	84	367	199	92	293	(b)
MERCURY	9	0.03	0.06	0.04	0.01	0.05	0.05
NICKEL	9	6.10	18.2	12.21	3.71	15.7	16
POTASSIUM	9	399.0	1485	815	415	1212	(b)
SELENIUM	6	0.11	0.24	0.14	0.05	0.19	(b)
SILVER	9	0.15	0.33	0.23	0.08	0.30	0.30
SODIUM	9	44.50	838	159.6	256	350.3	(b)
THALLIUM	6	0.22	0.34	0.25	0.05	0.29	0.29
VANADIUM	9	3.4	21	12	5.2	19	19
ZINC	9	26	84	46	19	62	(b)

(a) 95% UCL = 95% Upper Confidence Limit of the mean.
(b) Not evaluated; maximum on-site concentration less than Recommended Daily Allowance (See S.3.2)

Source: Ecology and Environment, Inc., 1994.

001160.0694

Table S.A-8

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
ORGANIC CHEMICALS
MOTON ELEMENTARY SCHOOL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (µg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1-DICHLOROETHENE	11	2.0	6.0	4.7	1.6	2.1	2.1
1,2-DICHLOROETHENE (total)	11	1.0	6.5	5.0	1.8	2.3	2.3
2-BUTANONE	11	5.0	23.0	8.5	6.5	2.2	2.2
4,4'-DDE	11	1.7	5.4	3.0	1.6	2.2	2.2
4,4'-DDT	11	1.7	17.0	6.0	5.3	2.8	2.8
ALDRIN	11	0.9	2.7	1.1	0.52	2.0	2.0
ALPHA-CHLORDANE	11	0.90	13	3.3	3.7	2.8	2.8
ANTHRACENE	11	24.0	200	135	70	2.6	2.6
AROCLOR-1260	11	17	215	76	87	3.3	3.3
BENZO(a)ANTHRACENE	11	41	360	158	102	2.4	2.4
BENZO(a)PYRENE	11	23	390	150	113	2.7	2.7
BENZO(b)FLUORANTHENE	11	20	450	178	132	2.8	2.8
BENZO(g,h,i)PERYLENE	11	36	340	149	86	2.4	2.4
BENZO(k)FLUORANTHENE	11	30	360	173	108	2.6	2.6
bis(2-ETHYLHEXYL)PHTHALATE	9	170	3100	788	961	3.5	3.5
BUTYLBENZYLPHTHALATE	11	20	215	148	75	2.8	2.8
CARBAZOLE	11	22	200	128	78	2.9	2.9
CHRYSENE	11	23	420	166	135	2.9	2.9
DI-N-BUTYLPHTHALATE	11	170	1100	290	273	2.2	2.2
DI-N-OCTYLPHTHALATE	11	20	380	142	104	2.9	2.9
DIELDRIN	11	1.7	8.5	2.8	2.0	2.2	2.2
DIETHYLPHTHALATE	11	22	215	172	51	2.4	2.4
ENDOSULFAN-I	11	0.90	2.2	1.1	0.37	1.9	1.9
ENDRIN	11	1.7	10	4.2	3.3	2.5	2.5
ENDRIN-ALDEHYDE	11	1.7	150	37	57	4.2	4.2
FLUORANTHENE	11	22	500	215	173	3.2	3.2
GAMMA-CHLORDANE	11	0.9	16	3.5	4.73	3.1	3.1
HEPTACHLOR	11	0.9	3.3	1.7	0.95	2.2	2.2
HEPTACHLOR-EPOXIDE	11	0.9	3.2	1.2	0.68	2.0	2.0
INDENO(1,2,3-cd)PYRENE	11	31	270	134	75	2.5	2.5
METHYLENE-CHLORIDE	11	3.0	10	6.0	2.0	2.0	2.0
NAPTHALENE	11	26	215	167	50	2.3	2.3
PHENANTHRENE	11	25	240	113	75	2.6	2.6
PYRENE	11	21	560	223	175	3.1	3.1
TETRACHLOROETHENE	11	2.0	6.5	5.3	1.2	2.0	2.0
TOLUENE	11	1.0	14	6.3	4.6	2.8	2.8
XYLENE	11	3.0	6.5	5.5	0.89	1.9	1.9

(a) 95% UCL = 95% Upper Confidence Limit of the mean.

Source: Ecology and Environment, Inc., 1994.

Table S.A-9
EXPOSURE POINT CONCENTRATIONS
INDOOR AIR VOCS
MOTON ELEMENTARY SCHOOL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (µg/m³) Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	2	14	33.9	24	14	27	27
1,2,4-TRIMETHYLBENZENE	2	6.0	6.0	6.0	0.00	6.0	6.0
1,3,5-TRIMETHYLBENZENE	2	2.2	2.2	2.2	0.04	2.2	2.2
1,4-DICHLOROBENZENE	1	1.6	1.6	1.6	—	1.6	1.6
BENZENE	2	3.8	5.8	4.8	1.4	4.9	4.9
CHLOROFORM	1	1.6	1.6	1.6	—	1.6	1.6
CHLOROMETHANE	2	0.87	0.93	0.90	0.04	0.90	0.90
ETHYLBENZENE	2	2.4	2.5	2.4	0.1	2.4	2.4
FREON 11	2	84	485	284	284	437	437
FREON 113	2	100	376	238	195	301	301
FREON 12	2	3.2	47	25	31	73.3	47
O-XYLENE	2	3.4	3.4	3.4	0.0	3.4	3.4
STYRENE	2	1.3	1.5	1.4	0.1	1.4	1.4
TOLUENE	2	12.8	17	15	3	15	15

(a) 95% UCL = 95% Upper Confidence Limit of the mean.

Source: Ecology and Environment, Inc., 1994.

Table S.A-10

EXPOSURE POINT CONCENTRATIONS
OUTDOOR AIR VOCS
MOTON ELEMENTARY SCHOOL
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Exposure Point Concentration (mg/m^3)
1,2,4-TRIMETHYLBENZENE	1.43E-3
BENZENE	2.59E-3
FREON 11	1.57E-3
FREON 12	2.28E-3
M,P-XYLENE	2.15E-3
O-XYLENE	8.72E-4
TOLUENE	3.27E-3

Source: Ecology and Environment, Inc., 1994

001160.0697

Table S.A-11

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
INORGANIC CHEMICALS
PRESS PARK COMMUNITY CENTER
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
ALUMINUM	5	2466	5900	4468	1480	7355	5900
ANTIMONY	5	5.7	6.2	6.0	0.18	6.0	6.0
ARSENIC	5	5.95	37.1	19.67	12.5	87.4	37.1
BARIUM	5	97	812	502	293	3952	812
BERYLLIUM	5	0.12	0.44	0.31	0.13	0.76	0.44
CADMIUM	5	0.34	3.3	1.5	1.2	27.2	3.26
CALCIUM	5	6821	29100	14122	8940	35745	(b)
CHROMIUM	5	7.7	75	40	28.1	381	(b)
COBALT	5	5.8	14.5	9.6	3.7	16.1	14.5
COPPER	5	35	887	352.56	337	20398	887
CYANIDE	5	0.55	2.7	1.3	1.0	6.4	2.7
IRON	5	9974	104167	54719	37632	535021	104167
MAGNESIUM	5	1326.13	2312	1786	472.08	2431	(b)
MANGANESE	5	204	969	499	304	1416	(b)
MERCURY	5	0.06	3.4	1.7	1.6	218983	3.37
NICKEL	5	15.1	77.0	44.01	28	170.2	77
POTASSIUM	5	433	2784	1378	925	5714	(b)
SELENIUM	5	0.33	0.36	0.34	0.01	0.34	(b)
SILVER	5	1.06	6.9	3.8	2.1	14	6.95
SODIUM	5	121	414	233	128	539	(b)
THALLIUM	5	0.45	0.98	0.57	0.23	0.86	0.86
VANADIUM	5	12	31	22.3	7.8	38	31
ZINC	5	143	2549	1280	949	41126	(b)

(a) 95% UCL = 95% Upper Confidence Limit of the mean.
(b) Not evaluated; maximum on-site concentration less than Recommended Daily Allowance (See S.3.2)

Source: Ecology and Environment, Inc., 1994.

001160.0698

Table S.A-12

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
ORGANIC CHEMICALS
PRESS PARK COMMUNITY CENTER
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg) Minimum	Maximum	Mean	Standard Deviation	95% UCLa	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	52	1.0	6.0	5.2	1.9	6.0	6.0
1,1-DICHLOROETHENE	49	2.0	5.8	5.2	1.3	5.8	5.8
1,2-DICHLOROETHENE (total)	52	1.0	6.0	5.2	1.3	6.0	6.0
2-METHYLNAPHTHALENE	52	19.0	232	166	63	232	232
4,4'-DDD	47	1.7	6.2	5.5	8.7	6.2	6.2
4,4'-DDE	47	1.7	23	16	28	23	23
4,4'-DDT	47	1.7	37	22.0	27	37	37
ACENAPHTHENE	52	0.6	309	184	65	309	309
ACENAPHTHYLENE	52	18	222	175	49	222	222
ACETONE	52	5.0	9.2	8.4	5.6	9.2	9.2
ALDRIN	47	0.9	1.2	1.1	0.6	1.2	1.2
ALPHA-CHLORDANE	47	0.9	127	78.6	254	127	127
ANTHRACENE	52	16	201	144	183	201	201
AROCLOR-1260	47	14	45.5	41.5	58	46	46
BENZO(a)ANTHRACENE	52	41	337	306	636	337	337
BENZO(a)PYRENE	52	23	365	327	715	365	365
BENZO(b)FLUORANTHENE	51	20	514	411	670	514	514
BENZO(g,h,i)PERYLENE	52	36	303	263	429	303	303
BENZO(k)FLUORANTHENE	52	30	308	302	662	308	308
BUTYLBENZYLPHTHALATE	52	18	252	178	206	252	252
CARBAZOLE	52	20	225	158	140	225	225
CHRYSENE	52	23	415	358	788	415	415
DI-N-BUTYLPHTHALATE	52	18	272	200	387	272	272
DI-N-OCTYLPHTHALATE	52	20	175	125	86	175	175
DIBENZ(a,h)ANTHRACENE	52	64	193	183	29	193	193
DIBENZOFURAN	52	19	214	179	41	214	214
DIELDRIN	47	1.7	8.8	6.9	9.2	8.8	8.8
ENDOSULFAN-II	47	1.7	2.8	2.6	2.6	2.8	2.8
ENDRIN	47	1.7	12	11	31	12	11.7
ENDRIN-ALDEHYDE	47	1.7	29	18	31	29	29
FLUORANTHENE	52	22	636	571	1531	636	636
FLUORENE	52	19	218	178	63	218	218
GAMMA-CHLORDANE	47	0.9	119	67	215	119	119
HEPTACHLOR	45	0.9	3.6	3.4	7.3	3.6	3.6
HEPTACHLOR-EPOXIDE	47	0.9	12.0	12	38	12	12
INDENO(1,2,3-cd)PYRENE	52	31	272	235	398	272	272
METHOXYCHLOR	47	0.9	13.4	12	8.5	13	13
METHYLENE-CHLORIDE	52	2.0	8.5	7.4	4.6	8.5	8.5
NAPTHALENE	52	22	212	156	66	212	212
PHENANTHRENE	52	25	309	291	764	309	309
PYRENE	52	21	577	521	1381	577	577
TETRACHLOROETHENE	52	2.0	5.8	5.4	1.1	5.8	5.8
TOLUENE	52	1.0	7.8	6.2	4.5	7.8	7.8
XYLENE	52	3.0	5.8	5.5	0.8	5.8	5.8
beta-BHC	47	0.9	1.3	1.2	0.9	1.3	1.3
bis(2-ETHYLHEXYL)PHTHALATE	42	60	1792	1079	1474.2	1792	1792
delta-BHC	47	0.9	1.5	1.5	3.1	1.5	1.5

(a) 95% UCL = 95% Upper Confidence Limit of the mean.

Source: Ecology and Environment, Inc., 1994.

Table S.A-13

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
INORGANIC SAMPLES
UNDEVELOPED AREA GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
Aluminum	52	1694	18896	8503	3694	9780	9780
Antimony	49	1.5	87.5	13.7	16.8	19.4	19.4
Arsenic	52	1.7	71	25.3	18.0	35	35
Barium	52	71	1523	685	433	900	900
Beryllium	52	0.07	1.30	0.28	0.30	0.35	0.35
Cadmium	52	0.36	23.9	7.4	6.8	14.6	14.6
Calcium	52	3755	66380	26287	13196	31877	(b)
Chromium	52	6.1	213	54	44	72	(b)
Cobalt	52	2.7	39	13.1	8.5	15.6	15.6
Copper	52	12.2	5273	623	850	1366	1366
Cyanide	52	0.09	5.1	1.25	1.21	1.76	1.76
Iron	52	3908	252910	88269	74499	147004	147004
Lead	52	38	28307	1896	3933	3677	3677
Magnesium	52	1030	5069	2695	823	2936	(b)
Manganese	52	89	2918	704	526	885	(b)
Mercury	52	0.03	5.2	0.99	1.16	1.9	1.85
Nickel	52	7.0	191	58	40	76	76
Potassium	52	324	4740	1563	943	1869	(b)
Selenium	52	0.11	2.00	0.52	0.39	0.67	(b)
Silver	52	0.15	57	5.5	9	11.6	11.6
Sodium	52	42.4	1574	371	320	463	(b)
Thallium	44	0.21	2.8	0.50	0.48	0.58	0.58
Vanadium	52	2.2	46	22	11.0	28	28
Zinc	52	103	7743	1865	1556	3320	(b)

(a) 95% UCL = 95% Upper Confidence Limit of the mean.
(b) Not evaluated; maximum on-site concentration less than Recommended Daily Allowance (See S.3.2)

Source: Ecology and Environment, Inc., 1994.

001160.0700

Table S.A-14

EXPOSURE POINT CONCENTRATIONS
SURFACE SOIL
ORGANIC CHEMICALS
UNDEVELOPED AREA GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (µg/kg) Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	52	1.0	9.0	5.22	1.87	6.1	6.1
1,1-DICHLOROETHENE	52	1.0	9.0	5.77	1.54	6.5	6.5
1,2-DICHLOROETHENE (total)	52	2.0	9.0	6	1	6.5	6.5
4,4'-DDE	43	1.7	820	102	209	256	256
4,4'-DDT	43	2.0	1200	123	236	229	229
ACENAPHTHENE	52	22	1050	193	184	286	286
ACENAPHTHYLENE	52	24	2700	198	368	250	250
ACETONE	52	5.5	26	8	4	8.3	8.3
ALDRIN	43	0.9	95	4	14	3.6	3.6
ALPHA-CHLORDANE	43	0.9	120	19	27	35	35
ANTHRACENE	52	29	3000	326	501	439	439
AROCLOR-1254	43	17	1850	139	372	119	119
AROCLOR-1260	43	17	1850	103	299	95	95
BENZO(a)ANTHRACENE	52	33	21000	1495	3364	2783	2783
BENZO(a)PYRENE	52	30	20000	1432	3165	2362	2362
BENZO(b)FLUORANTHENE	52	26	30000	1738	4430	2625	2625
BENZO(g,h,i)PERYLENE	52	24	13000	985	1909	1577	1577
BENZO(k)FLUORANTHENE	52	33	19000	1346	3218	1831	1831
bis(2-ETHYLHEXYL)PHTHALATE	48	22	3100	366	475	426	426
BUTYLBENZYLPHTHALATE	52	22	1050	236	203	308	308
CARBAZOLE	52	19	1100	184	204	246	246
CHRYSENE	52	35	21000	1534	3258	2548	2548
delta-BHC	43	0.9	95	3.54	14	2.3	2.3
DI-N-BUTYLPHTHALATE	52	26	1100	216	213	296	296
DI-N-OCTYLPHTHALATE	52	18	1050	184	145	260	260
DIBENZ(a,h)ANTHRACENE	52	50	7600	379	1031.3	348	348
DIBENZOFURAN	52	18	1050	186	156.3	265	265
DIELDRIN	43	1.7	185	14.17	29.7	19	19
DIETHYLPHTHALATE	52	21	490	196	88.2	260	260
ENDOSULFAN-II	43	1.7	370	17	56.3	16	16
ENDOSULFAN-SULFATE	43	1.7	185	8.0	27.9	6.5	6.5
ENDRIN	43	1.8	540	25	81.7	29	29
ENDRIN-ALDEHYDE	43	1.7	1100	49	167	67	67
ENDRIN-KETONE	43	1.7	185.0	8.4	28.00	7.1	7.1
FLUORANTHENE	52	42	16000	1984	3228	4096	4096
FLUORENE	52	20	1050	176	176	262	262
GAMMA-CHLORDANE	43	0.9	110.0	17	24.53	30.6	30.6
HEPTACHLOR	43	0.9	95	4.52	14.3	4.2	4.2
HEPTACHLOR-EPOXIDE	43	0.9	95	5.2	14.4	5.5	5.5
INDENO(1,2,3-cd)PYRENE	52	29	14000	952	2042	1359	1359
METHOXYCHLOR	43	8.5	950	55.56	172	42.7	42.7
METHYLENE-CHLORIDE	52	1.0	68.0	10	11.84	13.2	13.2
NAPTHALENE	52	21	1050	178	154	238	238
PHENANTHRENE	52	33	6900	926	1524	1449	1449
PYRENE	52	38	34000	2495	6050	3945	3945
TETRACHLOROETHENE	52	2.0	9.0	6.0	1.24	6.5	6.5
TOLUENE	52	1.0	32	6.3	4.27	7.3	7.3
XYLENE	52	3.0	9.0	6.1	0.96	6.4	6.4

Source: Ecology and Environment, Inc., 1994.

Table S.A-15

EXPOSURE POINT CONCENTRATIONS
COMBINED SUBSURFACE AND SURFACE SOIL
INORGANIC CHEMICALS
UNDEVELOPED AREA GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
ALUMINUM	83	1694	72367	10054	8663	10976	10976
ANTIMONY	77	1.5	87.5	15.7	17.3	21.0	21.0
ARSENIC	83	1.7	110	28.5	20.7	38	38
BARIUM	83	71	3075	753	497	937	937
BERYLLIUM	83	0.07	1.30	0.35	0.36	0.42	0.42
CADMIUM	83	0.35	28.9	7.8	7.1	14.1	14.1
CALCIUM	83	3755	66380	29604	15665	35109	(b)
CHROMIUM	83	6.1	213	60	43	76	(b)
COBALT	83	2.7	34	15.1	9.3	17.5	17.5
COPPER	83	9.9	7189	1201	3793	2042	2042
CYANIDE	83	0.09	7.2	1.37	1.40	1.75	1.75
IRON	83	3908	242691	100740	77241	154220	154220
LEAD	83	23	4657	1928	3207	3989	3989
MAGNESIUM	83	1030	10130	2896	1324	3104	(b)
MANGANESE	83	89	4889	812	727	979	(b)
MERCURY	83	0.03	5.6	1.15	1.20	2.0	1.96
NICKEL	83	7.0	191	64	44	78	78
POTASSIUM	83	324	4596	1651	1027	1893	(b)
SELENIUM	82	0.11	2.00	0.64	0.90	0.72	(b)
SILVER	83	0.15	19	7.9	14	14.6	14.6
SODIUM	83	42.4	4052	509	564	614	(b)
THALLIUM	68	0.20	21.6	1.11	2.89	1.02	1.02
VANADIUM	83	0.5	50	24	13.1	30	30
ZINC	83	48	10256	2282	1965	4209	(b)

(a) 95% UCL = 95% Upper Confidence Limit of the mean.
(b) Not evaluated; maximum on-site concentration less than Recommended Daily Allowance (See S.3.2)

Source: Ecology and Environment, Inc., 1994.

Table S.A-16

EXPOSURE POINT CONCENTRATIONS
COMBINED SUBSURFACE AND SURFACE SOIL
ORGANIC CHEMICALS
UNDEVELOPED GRID SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration (mg/kg) Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,1,1-TRICHLOROETHANE	82	0.001	0.01	0.006	0.002	0.006	0.006
1,1-DICHLOROETHENE	82	0.001	0.01	0.006	0.001	0.006	0.006
2-METHYLNAPHTHALENE	82	0.020	0.43	0.165	0.132	0.215	0.215
4,4'-DDD	82	0.001	18.00	0.254	1.986	0.070	0.070
4,4'-DDE	82	0.002	0.82	0.084	0.179	0.150	0.150
4,4'-DDT	82	0.000	4.50	0.156	0.546	0.225	0.225
ACENAPHTHENE	82	0.021	0.46	0.182	0.157	0.242	0.242
ACENAPHTHYLENE	82	0.020	2.70	0.188	0.297	0.227	0.227
ACETONE	82	0.006	0.11	0.012	0.019	0.011	0.011
ALDRIN	82	0.001	0.10	0.004	0.012	0.003	0.003
ALPHA-CHLORDANE	82	0.000	1.30	0.037	0.148	0.041	0.041
ANTHRACENE	82	0.029	3.00	0.286	0.410	0.337	0.337
AROCLOR-1254	82	0.017	1.90	0.138	0.393	0.099	0.099
AROCLOR-1260	82	0.017	1.90	0.119	0.306	0.111	0.111
BENZO(a)ANTHRACENE	82	0.024	21.00	1.195	2.738	1.823	1.823
BENZO(a)PYRENE	82	0.022	20.00	1.135	2.569	1.558	1.558
BENZO(b)FLUORANTHENE	82	0.026	30.00	1.437	3.600	2.074	2.074
BENZO(g,h,i)PERYLENE	82	0.024	13.00	0.810	1.561	1.129	1.129
BENZO(k)FLUORANTHENE	82	0.023	19.00	1.041	2.621	1.189	1.189
beta-BHC	82	0.001	0.10	0.003	0.011	0.003	0.003
bis(2-ETHYLHEXYL)PHTHALATE	74	0.022	3.10	0.351	0.427	0.393	0.393
BUTYLBENZYLPHTHALATE	82	0.022	0.96	0.235	0.176	0.276	0.276
CARBAZOLE	82	0.019	1.10	0.189	0.176	0.240	0.240
CHRYSENE	82	0.025	21.00	1.234	2.666	1.986	1.986
delta-BHC	82	0.000	0.10	0.003	0.010	0.002	0.002
DI-N-BUTYLPHTHALATE	82	0.026	1.10	0.207	0.187	0.255	0.255
DI-N-OCTYLPHTHALATE	82	0.018	0.43	0.199	0.121	0.250	0.250
DIBENZ(a,h)ANTHRACENE	82	0.050	7.60	0.336	0.826	0.313	0.313
DIBENZOFURAN	82	0.018	0.43	0.182	0.135	0.236	0.236
DIELDRIN	82	0.001	2.40	0.041	0.265	0.019	0.019
DIETHYLPHTHALATE	82	0.021	0.49	0.204	0.081	0.243	0.243
ENDOSULFAN-II	82	0.002	0.37	0.015	0.050	0.012	0.012
ENDOSULFAN-SULFATE	82	0.000	0.19	0.006	0.021	0.006	0.006
ENDRIN	82	0.002	0.54	0.019	0.061	0.019	0.019
ENDRIN-ALDEHYDE	82	0.002	0.19	0.030	0.122	0.031	0.031
ENDRIN-KETONE	82	0.001	0.23	0.011	0.035	0.008	0.008
FLUORANTHENE	82	0.028	16.00	1.644	2.753	2.873	2.873
FLUORENE	82	0.019	0.43	0.177	0.150	0.242	0.242
gama-BHC	82	0.001	0.10	0.003	0.010	0.002	0.002
GAMMA-CHLORDANE	82	0.000	0.50	0.021	0.057	0.031	0.031
HEPTACHLOR	82	0.001	0.10	0.003	0.010	0.003	0.003
HEPTACHLOR-EPOXIDE	82	0.001	0.10	0.005	0.012	0.004	0.004
INDENO(1,2,3-cd)PYRENE	82	0.029	14.00	0.773	1.660	0.935	0.935
METHOXYCHLOR	82	0.002	0.95	0.039	0.126	0.029	0.029
METHYLENE-CHLORIDE	81	0.001	0.08	0.011	0.013	0.013	0.013
NAPTHALENE	82	0.020	0.44	0.167	0.134	0.213	0.213
PHENANTHRENE	82	0.022	6.90	0.861	1.448	1.181	1.181
PYRENE	82	0.032	28.00	1.974	4.920	2.799	2.799
TETRACHLOROETHENE	82	0.002	0.01	0.006	0.003	0.007	0.007
TOLUENE	82	0.001	0.03	0.007	0.007	0.008	0.008
XYLENE	82	0.002	0.02	0.007	0.003	0.007	0.007

Source: Ecology and Environment, Inc., 1994.

Table S.A-17
EXPOSURE POINT CONCENTRATIONS
OUTDOOR AIR VOCS
UNDEVELOPED AREA
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Number of Samples	Concentration ($\mu g/m^3$)					
		Minimum	Maximum	Mean	Standard Deviation	95% UCL[a]	Exposure Point Concentration
1,2,4-TRIMETHYLBENZENE	2	0.00	1.4	0.69	0.98	1.4	1.4
BENZENE	2	3.19	5.1	4.2	1.37	4.3	4.3
CHLOROMETHANE	2	0.60	1.1	0.85	0.35	0.9	0.9
ETHYLBENZENE	2	0.92	1.0	0.98	0.09	1.0	1.0
FREON 11	2	1.82	2.0	1.9	0.16	1.9	1.9
FREON 12	2	2.62	3.0	2.8	0.26	2.8	2.8
M,P-XYLENE	2	2.84	3.2	3.0	0.26	3.0	3.0
O-XYLENE	2	1.08	1.1	1.1	0.004	1.1	1.1
TOLUENE	2	4.52	5.3	4.9	0.55	4.9	4.9

Source: Ecology and Environment, Inc., 1994.

Table S.A-18

EXPOSURE POINT CONCENTRATIONS
SELECTED[a] SHALLOW WELLS
INORGANIC CHEMICALS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Minimum	Maximum	Exposure Point Concentration (mg/L)
ALUMINUM	24	38	29
ARSENIC	0.034	0.16	0.08
BARIUM	1.7	9.3	4.7
BERYLLIUM	0.002	0.004	0.003
CADMIUM	0.005	0.046	0.02
CALCIUM	165	365	286
CHROMIUM	0.074	0.36	0.18
COBALT	0.018	0.087	0.04
COPPER	0.31	1.3	0.77
CYANIDE	0.01	0.15	0.05
IRON	44	252	164
LEAD	0.97	12	6.6
MANGANESE	1.2	2.3	2.0
MERCURY	0.00039	0.046	0.02
NICKEL	0.061	0.20	0.11
POTASSIUM	57	162	95
SELENIUM	0.002	0.11	0.05
SILVER	0.0028	0.018	0.01
VANADIUM	0.078	0.13	0.10
ZINC	2.1	23	12

(a) Arithmetic average values from Well Nos. 29, 19, and 21 used to estimate EPCs. Shallow wells are 5 to 15 feet deep.

Source: Ecology and Environment, Inc. 1994

001160.0705

Table S.A-19

EXPOSURE POINT CONCENTRATIONS
SELECTED[a] SHALLOW WELLS
ORGANIC CHEMICALS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Minimum	Maximum	Exposure Point Concentration (mg/L)
1,4-DICHLOROBENZENE	0.002	0.01	0.0040
2,4-DIMETHYLPHENOL	0.001	0.01	0.0037
4,4'-DDE	0.0001	0.00015	0.0001
4-METHYLPHENOL	0.002	0.01	0.006
ACENAPHTHENE	0.0009	0.01	0.0036
ACETONE	0.008	0.01	0.006
ALPHA-CHLORDANE	0.00003	0.00006	0.00004
BENZO(a)ANTHRACENE	0.0006	0.01	0.0035
BENZO(b)FLUORANTHENE	0.0006	0.01	0.0021
CHRYSENE	0.0008	0.01	0.0036
FLUORANTHENE	0.0009	0.01	0.0023
FLUORENE	0.0008	0.01	0.0036
GAMMA-CHLORDANE	0.00005	0.00008	0.00004
N-NITROSODIPHENYLAMINE	0.0006	0.01	0.0035
NAPTHALENE	0.002	0.01	0.004
PHENANTHRENE	0.0009	0.01	0.0023
PHENOL	0.0009	0.01	0.0036
PYRENE	0.001	0.01	0.0027

(a) Arithmetic average values from Well Nos. 29, 19, and 21 used to estimate EPCs. Shallow wells are 5 to 15 feet deep.

Source: Ecology and Environment, Inc. 1994

001160.0706

Table S.A-20

EXPOSURE POINT CONCENTRATIONS
SELECTED[a] DEEP WELLS
INORGANIC CHEMICALS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Concentration (mg/L)		
	Minimum	Maximum	Exposure Point Concentration (mg/L)
ALUMINUM	0.34	1.2	0.76
CALCIUM	129	163	146
POTASSIUM	53	141	97
SELENIUM	0.10	0.11	0.10
VANADIUM	0.0040	0.036	0.019
ZINC	0.072	0.076	0.074

(a) Arithmetric average values from Well Nos. 30 and 22 used to estimate EPCs. Deep wells are 60 to 70 feet deep.

Source: Ecology and Environment, Inc. 1994

Table S.A-21

EXPOSURE POINT CONCENTRATIONS
SELECTED DEEP WELLS[a]
ORGANIC CHEMICALS
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Chemical	Concentration (mg/L)		
	Minimum	Maximum	Exposure Point Concentration
2-METHYLPHENOL	0.01	0.032	0.019
4,4'-DDD	0.0001	0.0004	0.0002
4,4'-DDT	0.0001	0.001	0.0003
4-METHYLPHENOL	0.001	0.010	0.003
ACETONE	0.015	0.036	0.017
DI-N-OCTYLPHTHALATE	0.005	0.009	0.007
DIETHYLPHTHALATE	0.002	0.010	0.004
DIMETHYLPHTHALATE	0.010	0.029	0.017
N-NITROSODIPHENYLAMINE	0.002	0.010	0.006
NAPTHALENE	0.001	0.010	0.003
PHENOL	0.01	0.057	0.031

(a) Arithmetric average values from Well Nos. 30 and 22 used to estimate EPCs. Deep wells are 60 to 70 feet deep.

Source: Ecology and Environment, Inc. 1994

001160.0708

Table S.A-22

EXPOSURE POINT CONCENTRATIONS
HOMEGROWN PRODUCE SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

	Concentrations (mg/kg)				
	SGR 1		SGR 2		
Chemical	Carrots	Parsley	Garlic	Cabbage	Maximum
CADMIUM	0.6	0.2 *	0.35	0.25	6.0E-1
DIAZINON	2.9E-2	2.1	2.0E-3 *	2.0E-3 *	2.1E+0
MALATHION	6.0	0.68	4.0E-3 *	2.0E-3 *	6.0E+0
TRIFLURALIN	---	---	---	1.40E-2	1.4E-2

(*) One-half of the detection limit value
"--" not detected above the detection limit.

Source: Ecology and Environment, Inc., 1994.

Table S.A-23

EXPOSURE POINT CONCENTRATIONS
SURFACE AND SUBSURFACE SOIL
2,3,7,8-TCDD (EQUIVALENTS) SAMPLES
HUMAN HEALTH RISK ASSESSMENT
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Location/Soil Type	Exposure Point Concentration (mg/kg)
Surface Soils	
Undeveloped Area	3.09E-4
Moton Elementary School	3.00E-7
Surface plus Subsurface Soils	
Undeveloped Area	2.48E-4
Moton Elementary School	2.32E-4
Press Park Community Center	8.66E-5
Subsurface Soils	
Study Group Residence	2.28E-4

Source: Ecology and Environment, Inc. 1994

ATTACHMENT S.B

RISK CALCULATION SPREADSHEETS

Table S.B-1
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Child Residential RME Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times ED \times EF \times FI}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
IR	200	(mg/day)
ED	6	(years)
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	4.75E+3	4.9E-3	NA	NA	5.7E-2	NA	NA
Antimony	5.84E+0	6.0E-6	NA	NA	7.0E-5	4.00E-4	1.75E-1
Arsenic	1.13E+1	1.2E-5	1.75E+0	2.0E-5	1.4E-4	3.00E-4	4.53E-1
Barium	2.64E+2	2.7E-4	NA	NA	3.2E-3	7.00E-2	4.53E-2
Beryllium	2.32E-1	2.4E-7	4.30E+0	1.0E-6	2.8E-6	5.00E-3	5.57E-4
Cadmium	2.46E+0	2.5E-6	NA	NA	3.0E-5	5.00E-4	5.90E-2
Cobalt	7.15E+0	7.3E-6	NA	NA	8.6E-5	NA	NA
Copper	1.98E+2	2.0E-4	NA	NA	2.4E-3	3.70E-2	6.43E-2
Cyanide	6.26E-1	6.4E-7	NA	NA	7.5E-6	2.00E-2	3.75E-4
Iron	2.70E+4	2.8E-2	NA	NA	3.2E-1	NA	NA
Mercury	6.26E-1	6.4E-7	NA	NA	7.5E-6	3.00E-4	2.50E-2
Nickel	2.39E+1	2.5E-5	NA	NA	2.9E-4	2.00E-2	1.43E-2
Silver	3.23E+0	3.3E-6	NA	NA	3.9E-5	5.00E-3	7.75E-3
Thallium	3.98E-1	4.1E-7	NA	NA	4.8E-6	NA	NA
Vanadium	1.56E+1	1.6E-5	NA	NA	1.9E-4	7.00E-3	2.67E-2
1,1,1-TRICHLOROETHANE	5.98E-3	6.1E-9	NA	NA	7.2E-8	NA	NA
1,1-DICHLOROETHENE	5.76E-3	5.9E-9	6.00E-1	3.6E-9	6.9E-8	9.00E-3	7.68E-6
1,2-DICHLOROETHENE (total)	5.99E-3	6.2E-9	NA	NA	7.2E-8	9.00E-3	7.98E-6
2-METHYLNAPHTHALENE	2.32E-1	2.4E-7	NA	NA	2.8E-6	NA	NA
4,4'-DDD	6.17E-3	6.3E-9	2.40E-1	1.5E-9	7.4E-8	NA	NA
4,4'-DDE	2.28E-2	2.3E-8	3.40E-1	7.9E-9	2.7E-7	NA	NA
4,4'-DDT	3.66E-2	3.8E-8	3.40E-1	1.3E-8	4.4E-7	5.00E-4	8.77E-4
ACENAPHTHENE	3.09E-1	3.2E-7	NA	NA	3.7E-6	6.00E-1	6.16E-6
ACENAPHTHYLENE	2.22E-1	2.3E-7	NA	NA	2.7E-6	NA	NA
ACETONE	9.25E-3	9.5E-9	NA	NA	1.1E-7	1.00E+0	1.11E-7
ALDRIN	1.19E-3	1.2E-9	1.70E+1	2.1E-8	1.4E-8	3.00E-5	4.77E-4
ALPHA-CHLORDANE	1.27E-1	1.3E-7	NA	NA	1.5E-6	NA	NA
ANTHRACENE	2.01E-1	2.1E-7	NA	NA	2.4E-6	3.00E+0	8.02E-7
AROCLOR-1260	4.55E-2	4.7E-8	NA	NA	5.5E-7	NA	NA
BENZO(a)ANTHRACENE	3.37E-1	3.5E-7	7.30E-1 (*)	2.5E-7	4.0E-6	NA	NA
BENZO(a)PYRENE	3.65E-1	3.8E-7	7.30E+0	2.7E-6	4.4E-6	NA	NA
BENZO(b)FLUORANTHENE	5.14E-1	5.3E-7	7.30E-1 (*)	3.9E-7	6.2E-6	NA	NA
BENZO(g,h,i)PERYLENE	3.03E-1	3.1E-7	NA	NA	3.6E-6	NA	NA
BENZO(k)FLUORANTHENE	3.08E-1	3.2E-7	7.30E-2 (*)	2.3E-8	3.7E-6	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	2.6E-7	NA	NA	3.0E-6	2.00E+0	1.51E-6
CARBAZOLE	2.25E-1	2.3E-7	2.00E-2	4.6E-9	2.7E-6	NA	NA
CHRYSENE	4.15E-1	4.3E-7	7.30E-3 (*)	3.1E-9	5.0E-6	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	2.8E-7	NA	NA	3.3E-6	1.00E+0	3.26E-6
DI-N-OCTYLPHTHALATE	1.75E-1	1.8E-7	NA	NA	2.1E-6	2.00E-2	1.05E-4
DIBENZ(a,h)ANTHRACENE	1.93E-1	2.0E-7	7.30E+0 (*)	1.4E-6	2.3E-6	NA	NA
DIBENZOFURAN	2.14E-1	2.2E-7	NA	NA	2.6E-6	NA	NA
DIELDRIN	8.77E-3	9.0E-9	1.60E+1	1.4E-7	1.1E-7	5.00E-5	2.10E-3
ENDOSULFAN-II	2.80E-3	2.9E-9	NA	NA	3.4E-8	NA	NA
ENDRIN	1.17E-2	1.2E-8	NA	NA	1.4E-7	3.00E-4	4.66E-4
ENDRIN-ALDEHYDE	2.86E-2	2.9E-8	NA	NA	3.4E-7	NA	NA
FLUORANTHENE	6.36E-1	6.5E-7	NA	NA	7.6E-6	4.00E-1	1.91E-5
FLUORENE	2.18E-1	2.2E-7	NA	NA	2.6E-6	4.00E-1	6.53E-6
GAMMA-CHLORDANE	1.19E-1	1.2E-7	NA	NA	1.4E-6	NA	NA
HEPTACHLOR	3.59E-3	3.7E-9	4.50E+0	1.7E-8	4.3E-8	5.00E-4	8.60E-5
HEPTACHLOR-EPOXIDE	1.20E-2	1.2E-8	9.10E+0	1.1E-7	1.4E-7	1.30E-5	1.10E-2
INDENO(1,2,3-cd)PYRENE	2.72E-1	2.8E-7	7.30E-1 (*)	2.0E-7	3.3E-6	NA	NA
METHOXYCHLOR	1.34E-2	1.4E-8	NA	NA	1.6E-7	5.00E-3	3.20E-5
METHYLENE-CHLORIDE	8.51E-3	8.7E-9	7.50E-3	6.6E-11	1.0E-7	6.00E-2	1.70E-6
NAPTHALENE	2.12E-1	2.2E-7	NA	NA	2.5E-6	NA	NA
PHENANTHRENE	3.09E-1	3.2E-7	NA	NA	3.7E-6	NA	NA
PYRENE	5.77E-1	5.9E-7	NA	NA	6.9E-6	3.00E-1	2.31E-5
TETRACHLOROETHENE	5.83E-3	6.0E-9	5.20E-2	3.1E-10	7.0E-8	1.00E-1	6.99E-7
TOLUENE	7.84E-3	8.1E-9	NA	NA	9.4E-8	2.00E+0	4.70E-8
XYLENE	5.78E-3	5.9E-9	NA	NA	6.9E-8	2.00E+0	3.46E-8
beta-BHC	1.28E-3	1.3E-9	NA	NA	1.5E-8	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.79E+0	1.8E-6	1.40E-2	2.6E-8	2.1E-5	2.00E-2	1.07E-3
delta-BHC	1.46E-3	1.5E-9	NA	NA	1.8E-8	NA	NA
2,3,7,8-TCDD (Equiv)	3.09E-4	3.2E-10	1.50E+5	4.8E-5	3.7E-9	NA	NA
TOTAL				7.44E-5			0.89

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.0E-6
Summary Intake Factor, noncancer: 1.2E-5

Source: Ecology and Environment, Inc., 1994

Table S.B-2
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential RME Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times ED \times EF \times FI}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
IR	100	(mg/day)
ED	24	(years)
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	4.75E+3	2.2E-3	NA	NA	6.5E-3	NA	NA
Antimony	5.84E+0	2.7E-6	NA	NA	8.0E-6	4.00E-4	2.00E-2
Arsenic	1.13E+1	5.3E-6	1.75E+0	9.3E-6	1.6E-5	3.00E-4	5.17E-2
Barium	2.64E+2	1.2E-4	NA	NA	3.6E-4	7.00E-2	5.17E-3
Beryllium	2.32E-1	1.1E-7	4.30E+0	4.7E-7	3.2E-7	5.00E-3	6.36E-5
Cadmium	2.46E+0	1.2E-6	NA	NA	3.4E-6	5.00E-4	6.75E-3
Cobalt	7.15E+0	3.4E-6	NA	NA	9.8E-6	6.00E-2	1.63E-4
Copper	1.98E+2	9.3E-5	NA	NA	2.7E-4	3.70E-2	7.34E-3
Cyanide	6.26E-1	2.9E-7	NA	NA	8.6E-7	2.00E-2	4.29E-5
Iron	2.70E+4	1.3E-2	NA	NA	3.7E-2	NA	NA
Mercury	6.26E-1	2.9E-7	NA	NA	8.6E-7	3.00E-4	2.86E-3
Nickel	2.39E+1	1.1E-5	NA	NA	3.3E-5	2.00E-2	1.64E-3
Silver	3.23E+0	1.5E-6	NA	NA	4.4E-6	5.00E-3	8.85E-4
Thallium	3.98E-1	1.9E-7	NA	NA	5.5E-7	NA	NA
Vanadium	1.56E+1	7.3E-6	NA	NA	2.1E-5	7.00E-3	3.06E-3
1,1,1-TRICHLOROETHANE	5.98E-3	2.8E-9	NA	NA	8.2E-9	NA	NA
1,1-DICHLOROETHENE	5.76E-3	2.7E-9	6.00E-1	1.6E-9	7.9E-9	9.00E-3	8.77E-7
1,2-DICHLOROETHENE (total)	5.99E-3	2.8E-9	NA	NA	8.2E-9	9.00E-3	9.12E-7
2-METHYLNAPHTHALENE	2.32E-1	1.1E-7	NA	NA	3.2E-7	NA	NA
4,4'-DDD	6.17E-3	2.9E-9	2.40E-1	6.9E-10	8.4E-9	NA	NA
4,4'-DDE	2.28E-2	1.1E-8	3.40E-1	3.6E-9	3.1E-8	NA	NA
4,4'-DDT	3.66E-2	1.7E-8	3.40E-1	5.8E-9	5.0E-8	5.00E-4	1.00E-4
ACENAPHTHENE	3.09E-1	1.4E-7	NA	NA	4.2E-7	6.00E-2	7.04E-6
ACENAPHTHYLENE	2.22E-1	1.0E-7	NA	NA	3.0E-7	NA	NA
ACETONE	9.25E-3	4.3E-9	NA	NA	1.3E-8	1.00E-1	1.27E-7
ALDRIN	1.19E-3	5.6E-10	1.70E+1	9.5E-9	1.6E-9	3.00E-5	5.45E-5
ALPHA-CHLORDANE	1.27E-1	6.0E-8	NA	NA	1.7E-7	NA	NA
ANTHRACENE	2.01E-1	9.4E-8	NA	NA	2.7E-7	3.00E-1	9.16E-7
AROCLOR-1260	4.55E-2	2.1E-8	NA	NA	6.2E-8	NA	NA
BENZO(a)ANTHRACENE	3.37E-1	1.6E-7	7.30E-1 (*)	1.2E-7	4.6E-7	NA	NA
BENZO(a)PYRENE	3.65E-1	1.7E-7	7.30E+0	1.3E-6	5.0E-7	NA	NA
BENZO(b)FLUORANTHENE	5.14E-1	2.4E-7	7.30E-1 (*)	1.8E-7	7.0E-7	NA	NA
BENZO(g,h,i)PERYLENE	3.03E-1	1.4E-7	NA	NA	4.2E-7	NA	NA
BENZO(k)FLUORANTHENE	3.08E-1	1.4E-7	7.30E-2 (*)	1.1E-8	4.2E-7	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	1.2E-7	NA	NA	3.4E-7	2.00E-1	1.72E-6
CARBAZOLE	2.25E-1	1.1E-7	2.00E-2	2.1E-9	3.1E-7	NA	NA
CHRYSENE	4.15E-1	1.9E-7	7.30E-3 (*)	1.4E-9	5.7E-7	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	1.3E-7	NA	NA	3.7E-7	1.00E-1	3.73E-6
DI-N-OCTYLPHTHALATE	1.75E-1	8.2E-8	NA	NA	2.4E-7	2.00E-2	1.20E-5
DIBENZ(a,h)ANTHRACENE	1.93E-1	9.1E-8	7.30E+0 (*)	6.6E-7	2.6E-7	NA	NA
DIBENZOFURAN	2.14E-1	1.0E-7	NA	NA	2.9E-7	4.00E-3	7.33E-5
DIELDRIN	8.77E-3	4.1E-9	1.60E+1	6.6E-8	1.2E-8	5.00E-5	2.40E-4
ENDOSULFAN-II	2.80E-3	1.3E-9	NA	NA	3.8E-9	NA	NA
ENDRIN	1.17E-2	5.5E-9	NA	NA	1.6E-8	3.00E-4	5.33E-5
ENDRIN-ALDEHYDE	2.86E-2	1.3E-8	NA	NA	3.9E-8	NA	NA
FLUORANTHENE	6.36E-1	3.0E-7	NA	NA	8.7E-7	4.00E-2	2.18E-5
FLUORENE	2.18E-1	1.0E-7	NA	NA	3.0E-7	4.00E-2	7.47E-6
GAMMA-CHLORDANE	1.19E-1	5.6E-8	NA	NA	1.6E-7	NA	NA
HEPTACHLOR	3.59E-3	1.7E-9	4.50E+0	7.6E-9	4.9E-9	5.00E-4	9.82E-6
HEPTACHLOR-EPOXIDE	1.20E-2	5.6E-9	9.10E+0	5.1E-8	1.6E-8	1.30E-5	1.26E-3
INDENO(1,2,3-cd)PYRENE	2.72E-1	1.3E-7	7.30E-1 (*)	9.3E-8	3.7E-7	NA	NA
METHOXYCHLOR	1.34E-2	6.3E-9	NA	NA	1.8E-8	5.00E-3	3.66E-6
METHYLENE-CHLORIDE	8.51E-3	4.0E-9	7.50E-3	3.0E-11	1.2E-8	6.00E-2	1.94E-7
NAPTHALENE	2.12E-1	1.0E-7	NA	NA	2.9E-7	4.00E-2	7.26E-6
PHENANTHRENE	3.09E-1	1.5E-7	NA	NA	4.2E-7	NA	NA
PYRENE	5.77E-1	2.7E-7	NA	NA	7.9E-7	3.00E-2	2.64E-5
TETRACHLOROETHENE	5.83E-3	2.7E-9	5.20E-2	1.4E-10	8.0E-9	1.00E-2	7.99E-7
TOLUENE	7.84E-3	3.7E-9	NA	NA	1.1E-8	2.00E-1	5.37E-8
XYLENE	5.78E-3	2.7E-9	NA	NA	7.9E-9	2.00E+0	3.96E-9
beta-BHC	1.28E-3	6.0E-10	NA	NA	1.8E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.79E+0	8.4E-7	1.40E-2	1.2E-8	2.5E-6	2.00E-2	1.23E-4
delta-BHC	1.46E-3	6.9E-10	NA	NA	2.0E-9	NA	NA
2,3,7,8-TCDD (Equiv)	3.09E-4	1.5E-10	1.50E+5	2.2E-5	4.2E-10	NA	NA
TOTAL				3.40E-5			0.102

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criterion not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 4.7E-7
Summary Intake Factor, noncancer: 1.4E-6

Source: Ecology and Environment, Inc., 1994

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Table S.B-3
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential Average Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times ED \times EF \times FI}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
IR	100	(mg/day)
ED	9	(years)
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	4.75E+3	8.4E-4	NA	NA	6.5E-3	NA	NA
Antimony	5.84E+0	1.0E-6	NA	NA	8.0E-6	4.00E-4	2.0E-2
Arsenic	1.13E+1	2.0E-6	1.75E+0	3.5E-6	1.6E-5	3.00E-4	5.2E-2
Barium	2.64E+2	4.7E-5	NA	NA	3.6E-4	7.00E-2	5.2E-3
Beryllium	2.32E-1	4.1E-8	4.30E+0	1.8E-7	3.2E-7	5.00E-3	6.4E-5
Cadmium	2.46E+0	4.3E-7	NA	NA	3.4E-6	5.00E-4	6.7E-3
Cobalt	7.15E+0	1.3E-6	NA	NA	9.8E-6	6.00E-2	1.6E-4
Copper	1.98E+2	3.5E-5	NA	NA	2.7E-4	3.70E-2	7.3E-3
Cyanide	6.26E-1	1.1E-7	NA	NA	8.6E-7	2.00E-2	4.3E-5
Iron	2.70E+4	4.8E-3	NA	NA	3.7E-2	NA	NA
Mercury	6.26E-1	1.1E-7	NA	NA	8.6E-7	3.00E-4	2.9E-3
Nickel	2.39E+1	4.2E-6	NA	NA	3.3E-5	2.00E-2	1.6E-3
Silver	3.23E+0	5.7E-7	NA	NA	4.4E-6	5.00E-3	8.9E-4
Thallium	3.98E-1	7.0E-8	NA	NA	5.5E-7	NA	NA
Vanadium	1.56E+1	2.8E-6	NA	NA	2.1E-5	7.00E-3	3.1E-3
1,1,1-TRICHLOROETHANE	5.98E-3	1.1E-9	NA	NA	8.2E-9	NA	NA
1,1-DICHLOROETHENE	5.76E-3	1.0E-9	6.00E-1	6.1E-10	7.9E-9	9.00E-3	8.8E-7
1,2-DICHLOROETHENE (total)	5.99E-3	1.1E-9	NA	NA	8.2E-9	9.00E-3	9.1E-7
2-METHYLNAPHTHALENE	2.32E-1	4.1E-8	NA	NA	3.2E-7	NA	NA
4,4'-DDD	6.17E-3	1.1E-9	2.40E-1	2.6E-10	8.4E-9	NA	NA
4,4'-DDE	2.28E-2	4.0E-9	3.40E-1	1.4E-9	3.1E-8	NA	NA
4,4'-DDT	3.66E-2	6.4E-9	3.40E-1	2.2E-9	5.0E-8	5.00E-4	1.0E-4
ACENAPHTHENE	3.09E-1	5.4E-8	NA	NA	4.2E-7	6.00E-2	7.0E-6
ACENAPHTHYLENE	2.22E-1	3.9E-8	NA	NA	3.0E-7	NA	NA
ACETONE	9.25E-3	1.6E-9	NA	NA	1.3E-8	1.00E-1	1.3E-7
ALDRIN	1.19E-3	2.1E-10	1.70E+1	3.6E-9	1.6E-9	3.00E-5	5.5E-5
ALPHA-CHLORDANE	1.27E-1	2.2E-8	NA	NA	1.7E-7	NA	NA
ANTHRACENE	2.01E-1	3.5E-8	NA	NA	2.7E-7	3.00E-1	9.2E-7
AROCLOR-1260	4.55E-2	8.0E-9	NA	NA	6.2E-8	NA	NA
BENZO(a)ANTHRACENE	3.37E-1	5.9E-8	7.30E-1 (*)	4.3E-8	4.6E-7	NA	NA
BENZO(a)PYRENE	3.65E-1	6.4E-8	7.30E+0	4.7E-7	5.0E-7	NA	NA
BENZO(b)FLUORANTHENE	5.14E-1	9.0E-8	7.30E-1 (*)	6.6E-8	7.0E-7	NA	NA
BENZO(g,h,i)PERYLENE	3.03E-1	5.3E-8	NA	NA	4.2E-7	NA	NA
BENZO(k)FLUORANTHENE	3.08E-1	5.4E-8	7.30E-2 (*)	4.0E-9	4.2E-7	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	4.4E-8	NA	NA	3.4E-7	2.00E-1	1.7E-6
CARBAZOLE	2.25E-1	4.0E-8	2.00E-2	7.9E-10	3.1E-7	NA	NA
CHRYSENE	4.15E-1	7.3E-8	7.30E-3 (*)	5.3E-10	5.7E-7	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	4.8E-8	NA	NA	3.7E-7	1.00E-1	3.7E-6
DI-N-OCTYLPHTHALATE	1.75E-1	3.1E-8	NA	NA	2.4E-7	2.00E-2	1.2E-5
DIBENZ(a,h)ANTHRACENE	1.93E-1	3.4E-8	7.30E+0 (*)	2.5E-7	2.6E-7	NA	NA
DIBENZOFURAN	2.14E-1	3.8E-8	NA	NA	2.9E-7	4.00E-3	7.3E-5
DIELDRIN	8.77E-3	1.5E-9	1.60E+1	2.5E-8	1.2E-8	5.00E-5	2.4E-4
ENDOSULFAN-II	2.80E-3	4.9E-10	NA	NA	3.8E-9	NA	NA
ENDRIN	1.17E-2	2.1E-9	NA	NA	1.6E-8	3.00E-4	5.3E-5
ENDRIN-ALDEHYDE	2.86E-2	5.0E-9	NA	NA	3.9E-8	NA	NA
FLUORANTHENE	6.36E-1	1.1E-7	NA	NA	8.7E-7	4.00E-2	2.2E-5
FLUORENE	2.18E-1	3.8E-8	NA	NA	3.0E-7	4.00E-2	7.5E-6
GAMMA-CHLORDANE	1.19E-1	2.1E-8	NA	NA	1.6E-7	NA	NA
HEPTACHLOR	3.59E-3	6.3E-10	4.50E+0	2.8E-9	4.9E-9	5.00E-4	9.8E-6
HEPTACHLOR-EPOXIDE	1.20E-2	2.1E-9	9.10E+0	1.9E-8	1.6E-8	1.30E-5	1.3E-3
INDENO(1,2,3-cd)PYRENE	2.72E-1	4.8E-8	7.30E-1 (*)	3.5E-8	3.7E-7	NA	NA
METHOXYCHLOR	1.34E-2	2.4E-9	NA	NA	1.8E-8	5.00E-3	3.7E-6
METHYLENE-CHLORIDE	8.51E-3	1.5E-9	7.50E-3	1.1E-11	1.2E-8	6.00E-2	1.9E-7
NAPTHALENE	2.12E-1	3.7E-8	NA	NA	2.9E-7	4.00E-2	7.3E-6
PHENANTHRENE	3.09E-1	5.4E-8	NA	NA	4.2E-7	NA	NA
PYRENE	5.77E-1	1.0E-7	NA	NA	7.9E-7	3.00E-2	2.6E-5
TETRACHLOROETHENE	5.83E-3	1.0E-9	5.20E-2	5.3E-11	8.0E-9	1.00E-2	8.0E-7
TOLUENE	7.84E-3	1.4E-9	NA	NA	1.1E-8	2.00E-1	5.4E-8
XYLENE	5.78E-3	1.0E-9	NA	NA	7.9E-9	2.00E+0	4.0E-9
beta-BHC	1.28E-3	2.3E-10	NA	NA	1.8E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATI	1.79E+0	3.2E-7	1.40E-2	4.4E-9	2.5E-6	2.00E-2	1.2E-4
delta-BHC	1.46E-3	2.6E-10	NA	NA	2.0E-9	NA	NA
2,3,7,8-TCDD (Equiv)	3.09E-4	5.4E-11	1.50E+5	8.2E-6	4.2E-10	NA	NA
TOTAL				1.2BE-5			0.10

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criterion not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.8E-7
Summary Intake Factor, noncancer: 1.4E-6

Source: Ecology and Environment, Inc., 1994

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Table S.B-4
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Child Residential RME Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose
DA_{event}: dose absorbed per unit area per event
ED: exposure duration
EF: exposure frequency
CS: chemical conc. in soil
SA: skin surface area
AF: adherence factor
ABS: absorption factor
BW: body weight
AT: averaging time
CF: conversion factor

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	--	(unitless)
ED	6	(years)
EF	350	(days/year)
SA	1800	(cm^2)
CF	1E-6	(kg/mg)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	Carcinogenic Effects: DAD (mg/kg-day)	Carcinogenic Effects: Dermal SF $(mg/kg\text{-}day)^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: DAD (mg/kg-day)	Noncarcinogenic Effects: Subchronic Dermal RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
Aluminum	4.75E+3	0.1%	4.4E-5	NA	NA	5.1E-4	NA	NA
Antimony	5.84E+0	0.1%	5.4E-8	NA	NA	6.3E-7	2.00E-5 (b)	3.1E-2
Arsenic	1.13E+1	0.1%	1.0E-7	3.50E+1 (a)	3.7E-6	1.2E-6	1.50E-5 (b)	8.1E-2
Barium	2.64E+2	0.1%	2.4E-6	NA	NA	2.9E-5	3.50E-3 (b)	8.1E-3
Beryllium	2.32E-1	0.1%	2.1E-9	8.60E+1 (a)	1.8E-7	2.5E-8	2.50E-4 (b)	1.0E-4
Cadmium	2.46E+0	0.1%	2.3E-8	NA	NA	2.7E-7	2.50E-5 (b)	1.1E-2
Cobalt	7.15E+0	0.1%	6.6E-8	NA	NA	7.7E-7	NA	NA
Cyanide	6.26E-1	0.1%	5.8E-9	NA	NA	6.8E-8	1.00E-3 (b)	6.8E-5
Iron	2.70E+4	0.1%	2.5E-4	NA	NA	2.9E-3	NA	NA
Mercury	6.26E-1	0.1%	5.8E-9	NA	NA	6.8E-8	1.50E-5 (b)	4.5E-3
Nickel	2.39E+1	0.1%	2.2E-7	NA	NA	2.6E-6	1.00E-3 (b)	2.6E-3
Silver	3.23E+0	0.1%	3.0E-8	NA	NA	3.5E-7	2.50E-4 (b)	1.4E-3
Thallium	3.98E-1	0.1%	3.7E-9	NA	NA	4.3E-8	NA	NA
Vanadium	1.56E+1	0.1%	1.4E-7	NA	NA	1.7E-6	3.50E-4 (b)	4.8E-3
1,1,1-TRICHLOROETHANE	5.98E-3	1%	5.5E-10	NA	NA	6.4E-9	NA	NA
1,1-DICHLOROETHENE	5.76E-3	1%	5.3E-10	6.00E-1	3.2E-10	6.2E-9	9.00E-3	6.9E-7
1,2-DICHLOROETHENE (total)	5.99E-3	1%	5.5E-10	NA	NA	6.5E-9	9.00E-3	7.2E-7
2-METHYLNAPHTHALENE	2.32E-1	1%	2.1E-8	NA	NA	2.5E-7	NA	NA
4,4'-DDD	6.17E-3	1%	5.7E-10	2.40E-1	1.4E-10	6.7E-9	NA	NA
4,4'-DDE	2.28E-2	1%	2.1E-9	3.40E-1	7.2E-10	2.5E-8	NA	NA
4,4'-DDT	3.66E-2	1%	3.4E-9	3.40E-1	1.1E-9	3.9E-8	5.00E-4	7.9E-5
ACETONE	9.25E-3	1%	8.6E-10	NA	NA	1.0E-8	1.00E+0	1.0E-8
ALDRIN	1.19E-3	1%	1.1E-10	1.70E+1	1.9E-9	1.3E-9	3.00E-5	4.3E-5
ALPHA-CHLORDANE	1.27E-1	1%	1.2E-8	NA	NA	1.4E-7	NA	NA
AROCLOR-1260	4.55E-2	1%	4.2E-9	NA	NA	4.9E-8	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	1%	2.3E-8	NA	NA	2.7E-7	2.00E+0	1.4E-7
CARBAZOLE	2.25E-1	1%	2.1E-8	2.00E-2	4.2E-10	2.4E-7	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	1%	2.5E-8	NA	NA	2.9E-7	1.00E+0	2.9E-7
DI-N-OCTYLPHTHALATE	1.75E-1	1%	1.6E-8	NA	NA	1.9E-7	2.00E-2	9.4E-6
DIBENZOFURAN	2.14E-1	1%	2.0E-8	NA	NA	2.3E-7	NA	NA
DIELDRIN	8.77E-3	1%	8.1E-10	1.60E+1	1.3E-8	9.5E-9	5.00E-5	1.9E-4
ENDOSULFAN-II	2.80E-3	1%	2.6E-10	NA	NA	3.0E-9	NA	NA
ENDRIN	1.17E-2	1%	1.1E-9	NA	NA	1.3E-8	3.00E-4	4.2E-5
ENDRIN-ALDEHYDE	2.86E-2	1%	2.6E-9	NA	NA	3.1E-8	NA	NA
FLUORANTHENE	6.36E-1	1%	5.9E-8	NA	NA	6.9E-7	4.00E-1	1.7E-6
FLUORENE	2.18E-1	1%	2.0E-8	NA	NA	2.4E-7	4.00E-1	5.9E-7
GAMMA-CHLORDANE	1.19E-1	1%	1.1E-8	NA	NA	1.3E-7	NA	NA
HEPTACHLOR	3.59E-3	1%	3.3E-10	4.50E+0	1.5E-9	3.9E-9	5.00E-4	7.7E-6
HEPTACHLOR-EPOXIDE	1.20E-2	1%	1.1E-9	9.10E+0	1.0E-8	1.3E-8	1.30E-5	9.9E-4
METHOXYCHLOR	1.34E-2	1%	1.2E-9	NA	NA	1.4E-8	5.00E-3	2.9E-6
METHYLENE-CHLORIDE	8.51E-3	1%	7.9E-10	7.50E-3	5.9E-12	9.2E-9	6.00E-2	1.5E-7
NAPTHALENE	2.12E-1	1%	2.0E-8	NA	NA	2.3E-7	NA	NA
TETRACHLOROETHENE	5.83E-3	1%	5.4E-10	5.20E-2	2.8E-11	6.3E-9	1.00E-1	6.3E-8
TOLUENE	7.84E-3	1%	7.3E-10	NA	NA	8.5E-9	2.00E+0	4.2E-9
XYLENE	5.78E-3	1%	5.3E-10	NA	NA	6.2E-9	2.00E+0	3.1E-9
beta-BHC	1.28E-3	1%	1.2E-10	NA	NA	1.4E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.79E+0	1%	1.7E-7	1.40E-2	2.3E-9	1.9E-6	2.00E-2	9.7E-5
delta-BHC	1.46E-3	1%	1.4E-10	NA	NA	1.6E-9	NA	NA
2,3,7,8-TCDD (Equiv)	3.09E-4	1%	2.9E-11	1.50E+5	4.3E-6	3.3E-10	NA	NA
TOTAL					8.62E-6			0.15

NA : Toxicity criteria not available.

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Summary Intake Factor, cancer: 9.2E-6
Summary Intake Factor, noncancer: 1.1E-4

Source: Ecology and Environment, Inc., 1994

Table S.B-5
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential RME Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose
DA_{event}: dose absorbed per unit area per event
ED: exposure duration
EF: exposure frequency
CS: chemical conc. in soil
SA: skin surface area
AF: adherence factor
ABS: absorption factor
BW: body weight
AT: averaging time
CF: conversion factor

Exposure Factors:

CS*	–	(mg/kg)
DA_{event}*	–	(mg/kg-day)
AF	1	(mg/cm²-event)
ABS**	–	(unitless)
ED	24	(years)
EF	350	(days/year)
SA	5000	(cm²)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	DAD (mg/kg-day)	Dermal SF (mg/kg-day)⁻¹	Cancer Risk	DAD (mg/kg-day)	Dermal RfD (mg/kg-day)	Hazard Quotient
Aluminum	4.75E+3	0.1%	1.1E-4	NA	NA	3.3E-4	NA	NA
Antimony	5.84E+0	0.1%	1.4E-7	NA	NA	4.0E-7	2.00E-5 (b)	2.0E-2
Arsenic	1.13E+1	0.1%	2.7E-7	3.50E+1 (a)	9.3E-6	7.8E-7	1.50E-5 (b)	5.2E-2
Barium	2.64E+2	0.1%	6.2E-6	NA	NA	1.8E-5	3.50E-3 (b)	5.2E-3
Beryllium	2.32E-1	0.1%	5.5E-9	8.60E+1 (a)	4.7E-7	1.6E-8	2.50E-4 (b)	6.4E-5
Cadmium	2.46E+0	0.1%	5.8E-8	NA	NA	1.7E-7	2.50E-5 (b)	6.7E-3
Cobalt	7.15E+0	0.1%	1.7E-7	NA	NA	4.9E-7	NA	NA
Cyanide	6.26E-1	0.1%	1.5E-8	NA	NA	4.3E-8	1.00E-3 (b)	4.3E-5
Iron	2.70E+4	0.1%	6.3E-4	NA	NA	1.9E-3	NA	NA
Mercury	6.26E-1	0.1%	1.5E-8	NA	NA	4.3E-8	1.50E-5 (b)	2.9E-3
Nickel	2.39E+1	0.1%	5.6E-7	NA	NA	1.6E-6	1.00E-3 (b)	1.6E-3
Silver	3.23E+0	0.1%	7.6E-8	NA	NA	2.2E-7	2.50E-4 (b)	8.9E-4
Thallium	3.98E-1	0.1%	9.4E-9	NA	NA	2.7E-8	NA	NA
Vanadium	1.56E+1	0.1%	3.7E-7	NA	NA	1.1E-6	3.50E-4 (b)	3.1E-3
1,1,1-TRICHLOROETHANE	5.98E-3	1%	1.4E-9	NA	NA	4.1E-9	NA	NA
1,1-DICHLOROETHENE	5.76E-3	1%	1.4E-9	6.00E-1	8.1E-10	3.9E-9	9.00E-3	4.4E-7
1,2-DICHLOROETHENE (total)	5.99E-3	1%	1.4E-9	NA	NA	4.1E-9	9.00E-3	4.6E-7
2-METHYLNAPHTHALENE	2.32E-1	1%	5.5E-8	NA	NA	1.6E-7	NA	NA
4,4'-DDD	6.17E-3	1%	1.4E-9	2.40E-1	3.5E-10	4.2E-9	NA	NA
4,4'-DDE	2.28E-2	1%	5.3E-9	3.40E-1	1.8E-9	1.6E-8	NA	NA
4,4'-DDT	3.66E-2	1%	8.6E-9	3.40E-1	2.9E-9	2.5E-8	5.00E-4	5.0E-5
ACETONE	9.25E-3	1%	2.2E-9	NA	NA	6.3E-9	1.00E-1	6.3E-8
ALDRIN	1.19E-3	1%	2.8E-10	1.70E+1	4.8E-9	8.2E-10	3.00E-5	2.7E-5
ALPHA-CHLORDANE	1.27E-1	1%	3.0E-8	NA	NA	8.7E-8	NA	NA
AROCLOR-1260	4.55E-2	1%	1.1E-8	NA	NA	3.1E-8	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	1%	5.9E-8	NA	NA	1.7E-7	2.00E-1	8.6E-7
CARBAZOLE	2.25E-1	1%	5.3E-8	2.00E-2	1.1E-9	1.5E-7	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	1%	6.4E-8	NA	NA	1.9E-7	1.00E-1	1.9E-6
DI-N-OCTYLPHTHALATE	1.75E-1	1%	4.1E-8	NA	NA	1.2E-7	2.00E-2	6.0E-6
DIBENZOFURAN	2.14E-1	1%	5.0E-8	NA	NA	1.5E-7	4.00E-3	3.7E-5
DIELDRIN	8.77E-3	1%	2.1E-9	1.60E+1	3.3E-8	6.0E-9	5.00E-5	1.2E-4
ENDOSULFAN-II	2.80E-3	1%	6.6E-10	NA	NA	1.9E-9	NA	NA
ENDRIN	1.17E-2	1%	2.7E-9	NA	NA	8.0E-9	3.00E-4	2.7E-5
ENDRIN-ALDEHYDE	2.86E-2	1%	6.7E-9	NA	NA	2.0E-8	NA	NA
FLUORANTHENE	6.36E-1	1%	1.5E-7	NA	NA	4.4E-7	4.00E-2	1.1E-5
FLUORENE	2.18E-1	1%	5.1E-8	NA	NA	1.5E-7	4.00E-2	3.7E-6
GAMMA-CHLORDANE	1.19E-1	1%	2.8E-8	NA	NA	8.1E-8	NA	NA
HEPTACHLOR	3.59E-3	1%	8.4E-10	4.50E+0	3.8E-9	2.5E-9	5.00E-4	4.9E-6
HEPTACHLOR-EPOXIDE	1.20E-2	1%	2.8E-9	9.10E+0	2.6E-8	8.2E-9	1.30E-5	6.3E-4
METHOXYCHLOR	1.34E-2	1%	3.1E-9	NA	NA	9.1E-9	5.00E-3	1.8E-6
METHYLENE-CHLORIDE	8.51E-3	1%	2.0E-9	7.50E-3	1.5E-11	5.8E-9	6.00E-2	9.7E-8
NAPTHALENE	2.12E-1	1%	5.0E-8	NA	NA	1.5E-7	4.00E-2	3.6E-6
TETRACHLOROETHENE	5.83E-3	1%	1.4E-9	5.20E-2	7.1E-11	4.0E-9	1.00E-2	4.0E-7
TOLUENE	7.84E-3	1%	1.8E-9	NA	NA	5.4E-9	2.00E-1	2.7E-8
XYLENE	5.78E-3	1%	1.4E-9	NA	NA	4.0E-9	2.00E+0	2.0E-9
beta-BHC	1.28E-3	1%	3.0E-10	NA	NA	8.8E-10	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.79E+0	1%	4.2E-7	1.40E-2	5.9E-9	1.2E-6	2.00E-2	6.1E-5
delta-BHC	1.46E-3	1%	3.4E-10	NA	NA	1.0E-9	NA	NA
2,3,7,8-TCDD (Equiv)	3.09E-4	1%	7.3E-11	1.50E+5	1.1E-5	2.1E-10	NA	NA
TOTAL					2.19E-5			0.09

NA : Toxicity criteria not available.

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption efficiency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption efficiency

Summary Intake Factor, cancer: 2.3E-5
Summary Intake Factor, noncancer: 6.8E-5

Source: Ecology and Environment, Inc., 1994

Table S.B-6
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential Average Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	AF: adherence factor
	ABS: absorption factor
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time
CS: chemical conc. in soil	CF: conversion factor

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	0.2	(mg/cm^2-event)
ABS**	--	(unitless)
ED	9	(years)
EF	350	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	Carcinogenic Effects: DAD (mg/kg-day)	Carcinogenic Effects: Dermal SF $(mg/kg\text{-}day)^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: DAD (mg/kg-day)	Noncarcinogenic Effects: Dermal RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
Aluminum	4.75E+3	0.1%	8.4E-6	NA	NA	6.5E-5	NA	NA
Antimony	5.84E+0	0.1%	1.0E-8	NA	NA	8.0E-8	2.00E-5 (b)	4.0E-3
Arsenic	1.13E+1	0.1%	2.0E-8	3.50E+1 (a)	7.0E-7	1.6E-7	1.50E-5 (b)	1.0E-2
Barium	2.64E+2	0.1%	4.7E-7	NA	NA	3.6E-6	3.50E-3 (b)	1.0E-3
Beryllium	2.32E-1	0.1%	4.1E-10	8.60E+1 (a)	3.5E-8	3.2E-9	2.50E-4 (b)	1.3E-5
Cadmium	2.46E+0	0.1%	4.3E-9	NA	NA	3.4E-8	2.50E-5 (b)	1.3E-3
Cobalt	7.15E+0	0.1%	1.3E-8	NA	NA	9.8E-8	NA	NA
Cyanide	6.26E-1	0.1%	1.1E-9	NA	NA	8.6E-9	1.00E-3 (b)	8.6E-6
Iron	2.70E+4	0.1%	4.8E-5	NA	NA	3.7E-4	NA	NA
Mercury	6.26E-1	0.1%	1.1E-9	NA	NA	8.6E-9	1.50E-5 (b)	5.7E-4
Nickel	2.39E+1	0.1%	4.2E-8	NA	NA	3.3E-7	1.00E-3 (b)	3.3E-4
Silver	3.23E+0	0.1%	5.7E-9	NA	NA	4.4E-8	2.50E-4 (b)	1.8E-4
Thallium	3.98E-1	0.1%	7.0E-10	NA	NA	5.5E-9	NA	NA
Vanadium	1.56E+1	0.1%	2.8E-8	NA	NA	2.1E-7	3.50E-4 (b)	6.1E-4
1,1,1-TRICHLOROETHANE	5.98E-3	1%	1.1E-10	NA	NA	8.2E-10	NA	NA
1,1-DICHLOROETHENE	5.76E-3	1%	1.0E-10	6.00E-1	6.1E-11	7.9E-10	9.00E-3	8.8E-8
1,2-DICHLOROETHENE (total)	5.99E-3	1%	1.1E-10	NA	NA	8.2E-10	9.00E-3	9.1E-8
2-METHYLNAPHTHALENE	2.32E-1	1%	4.1E-9	NA	NA	3.2E-8	NA	NA
4,4'-DDD	6.17E-3	1%	1.1E-10	2.40E-1	2.6E-11	8.4E-10	NA	NA
4,4'-DDE	2.28E-2	1%	4.0E-10	3.40E-1	1.4E-10	3.1E-9	NA	NA
4,4'-DDT	3.66E-2	1%	6.4E-10	3.40E-1	2.2E-10	5.0E-9	5.00E-4	1.0E-5
ACETONE	9.25E-3	1%	1.6E-10	NA	NA	1.3E-9	1.00E+0	1.3E-9
ALDRIN	1.19E-3	1%	2.1E-11	1.70E+1	3.6E-10	1.6E-10	3.00E-5	5.5E-6
ALPHA-CHLORDANE	1.27E-1	1%	2.2E-9	NA	NA	1.7E-8	NA	NA
AROCLOR-1260	4.55E-2	1%	8.0E-10	NA	NA	6.2E-9	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	1%	4.4E-9	NA	NA	3.4E-8	2.00E+0	1.7E-8
CARBAZOLE	2.25E-1	1%	4.0E-9	2.00E-2	7.9E-11	3.1E-8	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	1%	4.8E-9	NA	NA	3.7E-8	1.00E+0	3.7E-8
DI-N-OCTYLPHTHALATE	1.75E-1	1%	3.1E-9	NA	NA	2.4E-8	2.00E-2	1.2E-6
DIBENZOFURAN	2.14E-1	1%	3.8E-9	NA	NA	2.9E-8	NA	NA
DIELDRIN	8.77E-3	1%	1.5E-10	1.60E+1	2.5E-9	1.2E-9	5.00E-5	2.4E-5
ENDOSULFAN-II	2.80E-3	1%	4.9E-11	NA	NA	3.8E-10	NA	NA
ENDRIN	1.17E-2	1%	2.1E-10	NA	NA	1.6E-9	3.00E-4	5.3E-6
ENDRIN-ALDEHYDE	2.86E-2	1%	5.0E-10	NA	NA	3.9E-9	NA	NA
FLUORANTHENE	6.36E-1	1%	1.1E-8	NA	NA	8.7E-8	4.00E-1	2.2E-7
FLUORENE	2.18E-1	1%	3.8E-9	NA	NA	3.0E-8	4.00E-1	7.5E-8
GAMMA-CHLORDANE	1.19E-1	1%	2.1E-9	NA	NA	1.6E-8	NA	NA
HEPTACHLOR	3.59E-3	1%	6.3E-11	4.50E+0	2.8E-10	4.9E-10	5.00E-4	9.8E-7
HEPTACHLOR-EPOXIDE	1.20E-2	1%	2.1E-10	9.10E+0	1.9E-9	1.6E-9	1.30E-5	1.3E-4
METHOXYCHLOR	1.34E-2	1%	2.4E-10	NA	NA	1.8E-9	5.00E-3	3.7E-7
METHYLENE-CHLORIDE	8.51E-3	1%	1.5E-10	7.50E-3	1.1E-12	1.2E-9	6.00E-2	1.9E-8
NAPTHALENE	2.12E-1	1%	3.7E-9	NA	NA	2.9E-8	NA	NA
TETRACHLOROETHENE	5.83E-3	1%	1.0E-10	5.20E-2	5.3E-12	8.0E-10	1.00E-1	8.0E-9
TOLUENE	7.84E-3	1%	1.4E-10	NA	NA	1.1E-9	2.00E+0	5.4E-10
XYLENE	5.78E-3	1%	1.0E-10	NA	NA	7.9E-10	2.00E+0	4.0E-10
beta-BHC	1.28E-3	1%	2.3E-11	NA	NA	1.8E-10	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.79E+0	1%	3.2E-8	1.40E-2	4.4E-10	2.5E-7	2.00E-2	1.2E-5
delta-BHC	1.46E-3	1%	2.6E-11	NA	NA	2.0E-10	NA	NA
2,3,7,8-TCDD (Equiv)	3.09E-4	1%	5.4E-12	1.50E+5	8.2E-7	4.2E-11	NA	NA
TOTAL					**1.64E-6**			**0.02**

NA : Toxicity criteria not available.

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Source: Ecology and Environment, Inc., 1994

Summary Intake Factor, cancer: 1.8E-6
Summary Intake Factor, noncancer: 1.4E-5

Table S.B-9
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential Average Scenario: Incidental Ingestion of Produce

Exposure Equation:

$$\text{Intake} = \frac{CF \times IR \times FI \times ED \times EF}{BW \times AT}$$

CF: chemical conc. in produce	FI: fraction ingested
IR: ingestion rate	BW: body weight
ED: exposure duration	AT: averaging time
EF: exposure frequency	

Exposure Factors:

CF*	–	(mg/kg)
IR	0.080	(mg/day)
ED	9	(years)
EF	350	(days/year)
FI	0.25	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
CADMIUM	6.00E-1	2.1E-5	NA	NA	1.6E-4	5.00E-4	3.3E-1
DIAZINON	2.10E+0	7.4E-5	NA	NA	5.8E-4	9E-4	6.4E-1
MALATHION	6.00E+0	2.1E-4	NA	NA	1.6E-3	2E-2	8.2E-2
TRIFLURALIN	1.40E-2	4.9E-7	7.7E-3	3.8E-9	3.8E-6	7.5E-3	5.1E-4
TOTAL				**3.8E-9**			**1.1**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criterion not available.

Summary Intake Factor, cancer: 3.5E-5
Summary Intake Factor, noncancer: 2.7E-4

Source: Ecology and Environment, Inc., 1994

Table S.B-10
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Currrent Child Residential RME Scenario: Inhalation of Indoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air	EF: exposure frequency
IR: inhalation rate	BW: body weight
ED: exposure duration	AT: averaging time
FI: fraction inhaled from contaminated source	

Exposure Factors:

CA*	--	(mg/m^3)
IR	5	(m^3/day)
ED	6	(years)
EF	350	(days/year)
FI	1	unitless
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

Chemical	Air Concentration (mg/m^3)	Carcinogenic Effects: LADI (mg/kg-day)	Carcinogenic Effects: Inhalation SF $(mg/kg\text{-}day)^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: CDI (mg/kg-day)	Noncarcinogenic Effects: Inhalation RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
1,1,1-TRICHLOROETHANE	2.17E-2	5.6E-4	NA	NA	6.5E-3	NA	NA
1,1-DICHLOROETHENE	1.41E-4	3.6E-6	1.75E-1	6.3E-7	4.2E-5	NA	NA
1,2,4-TRICHLOROBENZENE	1.75E-4	4.5E-6	NA	NA	5.2E-5	5.70E-2	9.2E-4
1,2,4-TRIMETHYLBENZENE	2.34E-2	6.0E-4	NA	NA	7.0E-3	NA	NA
1,2-DICHLOROBENZENE	1.43E-4	3.7E-6	NA	NA	4.3E-5	5.70E-2	7.5E-4
1,3,5-TRIMETHYLBENZENE	1.23E-2	3.2E-4	NA	NA	3.7E-3	NA	NA
1,3-DICHLOROBENZENE	3.00E-3	7.7E-5	NA	NA	9.0E-4	NA	NA
1,4-DICHLOROBENZENE	1.13E+0	2.9E-2	NA	NA	3.4E-1	2.28E-1	1.5E+0
BENZENE	9.86E-3	2.5E-4	2.90E-2	7.3E-6	3.0E-3	NA	NA
CHLOROBENZENE	1.75E-4	4.5E-6	NA	NA	5.2E-5	5.70E-3	9.2E-3
CHLOROETHANE	1.57E-4	4.0E-6	NA	NA	4.7E-5	2.86E+0	1.6E-5
CHLOROFORM	4.96E-2	1.3E-3	8.00E-2	1.0E-4	1.5E-2	NA	NA
CHLOROMETHANE	1.66E-3	4.3E-5	6.30E-3	2.7E-7	5.0E-4	NA	NA
ETHYLBENZENE	1.58E-2	4.1E-4	NA	NA	4.7E-3	2.85E-1	1.7E-2
FREON 11	1.23E-2	3.2E-4	NA	NA	3.7E-3	NA	NA
FREON 12	9.60E-3	2.5E-4	NA	NA	2.9E-3	NA	NA
M,P-XYLENE	2.91E-2	7.5E-4	NA	NA	8.7E-3	NA	NA
METHANE	3.07E-3	7.9E-5	NA	NA	9.2E-4	NA	NA
METHYLENE-CHLORIDE	4.41E-4	1.1E-5	1.64E-3	1.9E-8	1.3E-4	8.57E-1	1.5E-4
O-XYLENE	1.38E-2	3.6E-4	NA	NA	4.1E-3	NA	NA
STYRENE	6.52E-3	1.7E-4	NA	NA	2.0E-3	2.80E-1	7.0E-3
TETRACHLOROETHENE	5.17E-3	1.3E-4	2.00E-2	2.7E-6	1.5E-3	NA	NA
TOLUENE	5.08E-2	1.3E-3	NA	NA	1.5E-2	1.10E-1	1.4E-1
TRICHLOROETHENE	2.68E-4	6.9E-6	6.00E-3	4.1E-8	8.0E-5	NA	NA
TOTAL				**1.13E-4**			**1.66**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.6E-2
Summary Intake Factor, noncancer: 3.0E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-11
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential RME Scenario: Inhalation of Indoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air — EF: exposure frequency
IR: inhalation rate — BW: body weight
ED: exposure duration — AT: averaging time
FI: fraction inhaled from contmaminated source

Exposure Factors:

CA*	--	(mg/m^3)
IR	15	(m^3/day)
ED	24	(years)
EF	350	(days/year)
FI	1	unitless
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,1,1-TRICHLOROETHANE	2.17E-2	1.5E-3	NA	NA	4.5E-3	NA	NA
1,1-DICHLOROETHENE	1.41E-4	9.9E-6	1.75E-1	1.7E-6	2.9E-5	NA	NA
1,2,4-TRICHLOROBENZENI	1.75E-4	1.2E-5	NA	NA	3.6E-5	5.70E-2	6.3E-4
1,2,4-TRIMETHYLBENZENE	2.34E-2	1.7E-3	NA	NA	4.8E-3	NA	NA
1,2-DICHLOROBENZENE	1.43E-4	1.0E-5	NA	NA	2.9E-5	5.70E-2	5.2E-4
1,3,5-TRIMETHYLBENZENE	1.23E-2	8.6E-4	NA	NA	2.5E-3	NA	NA
1,3-DICHLOROBENZENE	3.00E-3	2.1E-4	NA	NA	6.2E-4	NA	NA
1,4-DICHLOROBENZENE	1.13E+0	7.9E-2	NA	NA	2.3E-1	2.28E-1	1.0E+0
BENZENE	9.86E-3	6.9E-4	2.90E-2	2.0E-5	2.0E-3	NA	NA
CHLOROBENZENE	1.75E-4	1.2E-5	NA	NA	3.6E-5	5.70E-3	6.3E-3
CHLOROETHANE	1.57E-4	1.1E-5	NA	NA	3.2E-5	2.86E+0	1.1E-5
CHLOROFORM	4.96E-2	3.5E-3	8.00E-2	2.8E-4	1.0E-2	NA	NA
CHLOROMETHANE	1.66E-3	1.2E-4	6.30E-3	7.4E-7	3.4E-4	NA	NA
ETHYLBENZENE	1.58E-2	1.1E-3	NA	NA	3.2E-3	2.85E-1	1.1E-2
FREON 11	1.23E-2	8.7E-4	NA	NA	2.5E-3	NA	NA
FREON 12	9.60E-3	6.8E-4	NA	NA	2.0E-3	NA	NA
M,P-XYLENE	2.91E-2	2.1E-3	NA	NA	6.0E-3	NA	NA
METHANE	3.07E-3	2.2E-4	NA	NA	6.3E-4	NA	NA
METHYLENE-CHLORIDE	4.41E-4	3.1E-5	1.64E-3	5.1E-8	9.1E-5	8.57E-1	1.1E-4
O-XYLENE	1.38E-2	9.8E-4	NA	NA	2.8E-3	NA	NA
STYRENE	6.52E-3	4.6E-4	NA	NA	1.3E-3	2.80E-1	4.8E-3
TETRACHLOROETHENE	5.17E-3	3.6E-4	2.00E-2	7.3E-6	1.1E-3	NA	NA
TOLUENE	5.08E-2	3.6E-3	NA	NA	1.0E-2	1.10E-1	9.5E-2
TRICHLOROETHENE	2.68E-4	1.9E-5	6.00E-3	1.1E-7	5.5E-5	NA	NA
TOTAL				3.10E-4			1.14

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 7.0E-2
Summary Intake Factor, noncancer: 2.1E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-12
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential Average Scenario: Inhalation of Indoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air
IR: inhalation rate
ED: exposure duration
FI: fraction inhaled from contaminated source
EF: exposure frequency
BW: body weight
AT: averaging time

Exposure Factors:

CA*	--	(mg/m^3)
IR	15	(m^3/day)
ED	9	(years)
EF	350	(days/year)
FI	1	unitless
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-day})^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,1,1-TRICHLOROETHANE	2.17E-2	5.7E-4	NA	NA	4.5E-3	NA	NA
1,1-DICHLOROETHENE	1.41E-4	3.7E-6	1.75E-1	6.5E-7	2.9E-5	NA	NA
1,2,4-TRICHLOROBENZENE	1.75E-4	4.6E-6	NA	NA	3.6E-5	5.70E-2	6.3E-4
1,2,4-TRIMETHYLBENZENE	2.34E-2	6.2E-4	NA	NA	4.8E-3	NA	NA
1,2-DICHLOROBENZENE	1.43E-4	3.8E-6	NA	NA	2.9E-5	5.70E-2	5.2E-4
1,3,5-TRIMETHYLBENZENE	1.23E-2	3.2E-4	NA	NA	2.5E-3	NA	NA
1,3-DICHLOROBENZENE	3.00E-3	7.9E-5	NA	NA	6.2E-4	NA	NA
1,4-DICHLOROBENZENE	1.13E+0	3.0E-2	NA	NA	2.3E-1	2.28E-1	1.0E+0
BENZENE	9.86E-3	2.6E-4	2.90E-2	7.6E-6	2.0E-3	NA	NA
CHLOROBENZENE	1.75E-4	4.6E-6	NA	NA	3.6E-5	5.70E-3	6.3E-3
CHLOROETHANE	1.57E-4	4.2E-6	NA	NA	3.2E-5	2.86E+0	1.1E-5
CHLOROFORM	4.96E-2	1.3E-3	8.00E-2	1.0E-4	1.0E-2	NA	NA
CHLOROMETHANE	1.66E-3	4.4E-5	6.30E-3	2.8E-7	3.4E-4	NA	NA
ETHYLBENZENE	1.58E-2	4.2E-4	NA	NA	3.2E-3	2.85E-1	1.1E-2
FREON 11	1.23E-2	3.3E-4	NA	NA	2.5E-3	NA	NA
FREON 12	9.60E-3	2.5E-4	NA	NA	2.0E-3	NA	NA
M,P-XYLENE	2.91E-2	7.7E-4	NA	NA	6.0E-3	NA	NA
METHANE	3.07E-3	8.1E-5	NA	NA	6.3E-4	NA	NA
METHYLENE-CHLORIDE	4.41E-4	1.2E-5	1.64E-3	1.9E-8	9.1E-5	8.57E-1	1.1E-4
O-XYLENE	1.38E-2	3.7E-4	NA	NA	2.8E-3	NA	NA
STYRENE	6.52E-3	1.7E-4	NA	NA	1.3E-3	2.80E-1	4.8E-3
TETRACHLOROETHENE	5.17E-3	1.4E-4	2.00E-2	2.7E-6	1.1E-3	NA	NA
TOLUENE	5.08E-2	1.3E-3	NA	NA	1.0E-2	1.10E-1	9.5E-2
TRICHLOROETHENE	2.68E-4	7.1E-6	6.00E-3	4.2E-8	5.5E-5	NA	NA
TOTAL				**1.16E-4**			**1.14**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.6E-2
Summary Intake Factor, noncancer: 2.1E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-15

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Adult Residential Average Scenario: Inhalation of Outdoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air
IR: inhalation rate
ED: exposure duration
FI: fraction inhaled from source
EF: exposure frequency
BW: body weight
AT: averaging time

Exposure Factors:

CA*	–	(mg/m^3)
IR	20	(m^3/day)
ED	9	(years)
EF	350	(days/year)
FI	1	unitless
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,1,1-TRICHLOROETHANE	2.13E-3	7.5E-5	NA	NA	5.8E-4	NA	NA
1,2,4-TRIMETHYLBENZEN	5.96E-3	2.1E-4	NA	NA	1.6E-3	NA	NA
1,4-DICHLOROBENZENE	8.18E-3	2.9E-4	NA	NA	2.2E-3	2.28E-1	9.8E-3
BENZENE	1.28E-2	4.5E-4	2.90E-2	1.3E-5	3.5E-3	NA	NA
CHLOROFORM	2.12E-2	7.5E-4	8.00E-2	6.0E-5	5.8E-3	NA	NA
CHLOROMETHANE	9.53E-4	3.4E-5	6.30E-3	2.1E-7	2.6E-4	NA	NA
ETHYLBENZENE	2.01E-2	7.1E-4	NA	NA	5.5E-3	2.85E-1	1.9E-2
FREON 11	1.05E-2	3.7E-4	NA	NA	2.9E-3	NA	NA
FREON 12	4.45E-3	1.6E-4	NA	NA	1.2E-3	NA	NA
M,P-XYLENE	1.12E-2	4.0E-4	NA	NA	3.1E-3	NA	NA
O-XYLENE	3.92E-3	1.4E-4	NA	NA	1.1E-3	NA	NA
TOLUENE	6.99E-3	2.5E-4	NA	NA	1.9E-3	1.10E-1	1.7E-2
TRICHLOROETHENE	3.89E-3	1.4E-4	6.00E-3	8.2E-7	1.1E-3	NA	NA
TOTAL				**7.37E-5**			**0.04657**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 3.5E-2
Summary Intake Factor, noncancer: 2.7E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-16
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Child Current Moton Elementary School RME Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times ED \times EF \times FI}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	–	(mg/kg)
IR	100	(mg/day)
ED	6	(years)
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	30	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	6.7E+3	1.8E-3	NA	NA	2.1E-2	NA	NA
ANTIMONY	3.5E+0	9.7E-7	NA	NA	1.1E-5	4.00E-4	2.82E-2
ARSENIC	5.5E+0	1.5E-6	1.75E+0	2.7E-6	1.8E-5	3.00E-4	5.90E-2
BARIUM	9.7E+1	2.6E-5	NA	NA	3.1E-4	7.00E-2	4.41E-3
BERYLLIUM	3.1E-1	8.6E-8	4.30E+0	3.7E-7	1.0E-6	5.00E-3	2.00E-4
CADMIUM	4.4E-1	1.2E-7	NA	NA	1.4E-6	5.00E-4	2.83E-3
COBALT	6.7E+0	1.8E-6	NA	NA	2.1E-5	NA	NA
COPPER	1.4E+1	3.8E-6	NA	NA	4.4E-5	3.70E-2	1.19E-3
CYANIDE	3.8E+0	1.0E-6	NA	NA	1.2E-5	2.00E-2	6.10E-4
IRON	1.1E+4	3.1E-3	NA	NA	3.6E-2	NA	NA
MERCURY	5.5E-2	1.5E-8	NA	NA	1.7E-7	3.00E-4	5.82E-4
NICKEL	1.6E+1	4.3E-6	NA	NA	5.0E-5	2.00E-2	2.51E-3
SILVER	3.0E-1	8.1E-8	NA	NA	9.5E-7	5.00E-3	1.89E-4
THALLIUM	2.9E-1	8.0E-8	NA	NA	9.4E-7	NA	NA
VANADIUM	1.9E+1	5.3E-6	NA	NA	6.2E-5	7.00E-3	8.80E-3
1,1-DICHLOROETHENE	2.1E-3	5.8E-10	6.00E-1	3.5E-10	6.7E-9	9.00E-3	7.45E-7
1,2-DICHLOROETHENE (total)	2.3E-3	6.3E-10	NA	NA	7.4E-9	9.00E-3	8.18E-7
2-BUTANONE	2.2E-3	6.1E-10	NA	NA	7.2E-9	NA	NA
4,4'-DDE	2.2E-3	6.0E-10	3.40E-1	2.0E-10	7.0E-9	NA	NA
4,4'-DDT	2.8E-3	7.6E-10	3.40E-1	2.6E-10	8.8E-9	5.00E-4	1.76E-5
ALDRIN	2.0E-3	5.4E-10	1.70E+1	9.2E-9	6.3E-9	3.00E-5	2.09E-4
ALPHA-CHLORDANE	2.8E-3	7.8E-10	NA	NA	9.1E-9	NA	NA
ANTHRACENE	2.6E-3	7.1E-10	NA	NA	8.3E-9	3.00E+0	2.76E-9
AROCLOR-1260	3.3E-3	9.0E-10	NA	NA	1.1E-8	NA	NA
BENZO(a)ANTHRACENE	2.4E-3	6.6E-10	7.30E-1 (*)	4.8E-10	7.7E-9	NA	NA
BENZO(a)PYRENE	2.7E-3	7.5E-10	7.30E+0	5.4E-9	8.7E-9	NA	NA
BENZO(b)FLUORANTHENE	2.8E-3	7.7E-10	7.30E-1 (*)	5.6E-10	9.0E-9	NA	NA
BENZO(g,h,i)PERYLENE	2.4E-3	6.6E-10	NA	NA	7.7E-9	NA	NA
BENZO(k)FLUORANTHENE	2.6E-3	7.1E-10	7.30E-2 (*)	5.2E-11	8.3E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALA	3.5E-3	9.5E-10	1.40E-2	1.3E-11	1.1E-8	2.00E-2	5.51E-7
BUTYLBENZYLPHTHALATE	2.8E-3	7.6E-10	NA	NA	8.9E-9	2.00E+0	4.44E-9
CARBAZOLE	2.9E-3	7.9E-10	2.00E-2	1.6E-11	9.2E-9	NA	NA
CHRYSENE	2.9E-3	8.1E-10	7.30E-3 (*)	5.9E-12	9.4E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.2E-3	6.1E-10	NA	NA	7.2E-9	1.00E+0	7.16E-9
DI-N-OCTYLPHTHALATE	2.9E-3	7.9E-10	NA	NA	9.2E-9	2.00E-2	4.60E-7
DIELDRIN	2.2E-3	6.0E-10	1.60E+1	9.6E-9	7.0E-9	5.00E-5	1.40E-4
DIETHYLPHTHALATE	2.4E-3	6.6E-10	NA	NA	7.6E-9	8.00E+0	9.56E-10
ENDOSULFAN-I	1.9E-3	5.2E-10	NA	NA	6.1E-9	NA	NA
ENDRIN	2.5E-3	6.9E-10	NA	NA	8.0E-9	3.00E-4	2.68E-5
ENDRIN ALDEHYDE	4.2E-3	1.2E-9	NA	NA	1.4E-8	NA	NA
FLUORANTHENE	3.2E-3	8.7E-10	NA	NA	1.0E-8	4.00E-1	2.55E-8
GAMMA-CHLORDANE	3.1E-3	8.5E-10	NA	NA	9.9E-9	NA	NA
HEPTACHLOR	2.2E-3	6.1E-10	4.50E+0	2.7E-9	7.1E-9	5.00E-4	1.42E-5
HEPTACHLOR-EPOXIDE	2.0E-3	5.5E-10	9.10E+0	5.0E-9	6.5E-9	1.30E-5	4.97E-4
INDENO(1,2,3-cd)PYRENE	2.5E-3	6.8E-10	7.30E-1 (*)	4.9E-10	7.9E-9	NA	NA
METHYLENE-CHLORIDE	2.0E-3	5.5E-10	7.50E-3	4.2E-12	6.5E-9	6.00E-2	1.08E-7
NAPTHALENE	2.3E-3	6.3E-10	NA	NA	7.4E-9	NA	NA
PHENANTHRENE	2.6E-3	7.0E-10	NA	NA	8.2E-9	NA	NA
PYRENE	3.1E-3	8.6E-10	NA	NA	1.0E-8	3.00E-1	3.34E-8
TETRACHLOROETHENE	2.0E-3	5.4E-10	5.20E-2	2.8E-11	6.3E-9	1.00E-1	6.31E-8
TOLUENE	2.8E-3	7.6E-10	NA	NA	8.9E-9	2.00E+0	4.46E-9
XYLENE	1.9E-3	5.1E-10	NA	NA	6.0E-9	2.00E+0	2.98E-9
2,3,7,8-TCDD (Equiv)	3.0E-7	8.2E-14	1.50E+5	1.2E-8	9.6E-13	NA	NA
TOTAL				3.07E-6			0.109

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 2.7E-7
Summary Intake Factor, noncancer: 3.2E-6

Source: Ecology and Environment, Inc., 1994

Table S.B-17
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Child Moton Elementary School RME Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	AF: adherence factor
	ABS: absorption factor
ED: exposure duration	BW: bodyweight
EF: exposure frequency	AT: averaging time
CS: chemical conc. in soil	CF: conversion factor

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	--	(unitless)
ED	6	(years)
EF	350	(days/year)
SA	2620	(cm^2)
CF	1E-6	(kg/mg)
BW	30	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	DAD (mg/kg-day)	Dermal SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	DAD (mg/kg-day)	Subchronic Dermal RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	8.7E+3	0.1%	4.8E-5	NA	NA	5.6E-4	NA	NA
ANTIMONY	3.5E+0	0.1%	2.5E-8	NA	NA	3.0E-7	2.00E-5 (b)	1.5E-2
ARSENIC	5.5E+0	0.1%	4.0E-8	3.50E+1 (a)	1.4E-6	4.6E-7	1.50E-5 (b)	3.1E-2
BARIUM	9.7E+1	0.1%	6.9E-7	NA	NA	8.1E-6	3.50E-3 (b)	2.3E-3
BERYLLIUM	3.1E-1	0.1%	2.2E-9	8.60E+1 (a)	1.9E-7	2.6E-8	2.50E-4 (b)	1.0E-4
CADMIUM	4.4E-1	0.1%	3.2E-9	NA	NA	3.7E-8	2.50E-5 (b)	1.5E-3
COBALT	6.7E+0	0.1%	4.8E-8	NA	NA	5.6E-7	NA	NA
COPPER	1.4E+1	0.1%	9.9E-8	NA	NA	1.1E-6	1.85E-3 (b)	6.2E-4
CYANIDE	3.8E+0	0.1%	2.7E-8	NA	NA	3.2E-7	1.00E-3 (b)	3.2E-4
IRON	1.1E+4	0.1%	8.1E-5	NA	NA	9.4E-4	NA	NA
MERCURY	5.5E-2	0.1%	3.9E-10	NA	NA	4.6E-9	1.50E-5 (b)	3.0E-4
NICKEL	1.6E+1	0.1%	1.1E-7	NA	NA	1.3E-6	1.00E-3 (b)	1.3E-3
SILVER	3.0E-1	0.1%	2.1E-9	NA	NA	2.5E-8	2.50E-4 (b)	9.9E-5
THALLIUM	2.9E-1	0.1%	2.1E-9	NA	NA	2.5E-8	NA	NA
VANADIUM	1.9E+1	0.1%	1.4E-7	NA	NA	1.6E-6	3.50E-4 (b)	4.6E-3
1,1-DICHLOROETHENE	2.1E-3	1.0%	1.5E-10	6.00E-1	9.0E-11	1.8E-9	9.00E-3	2.0E-7
1,2-DICHLOROETHENE (total)	2.3E-3	1.0%	1.7E-10	NA	NA	1.9E-9	9.00E-3	2.1E-7
2-BUTANONE	2.2E-3	1.0%	1.6E-10	NA	NA	1.9E-9	NA	NA
4,4'-DDE	2.2E-3	1.0%	1.6E-10	3.40E-1	5.4E-11	1.8E-9	NA	NA
4,4'-DDT	2.8E-3	1.0%	2.0E-10	3.40E-1	6.7E-11	2.3E-9	5.00E-4	4.6E-6
ALDRIN	2.0E-3	1.0%	1.4E-10	1.70E+1	2.4E-9	1.6E-9	3.00E-5	5.5E-5
ALPHA-CHLORDANE	2.8E-3	1.0%	2.0E-10	NA	NA	2.4E-9	NA	NA
ANTHRACENE	2.6E-3	1.0%	1.9E-10	NA	NA	2.2E-9	3.00E+0	7.2E-10
AROCLOR-1260	3.3E-3	1.0%	2.4E-10	NA	NA	2.8E-9	NA	NA
BENZO(a)ANTHRACENE	2.4E-3	1.0%	1.7E-10	7.30E-1	1.3E-10	2.0E-9	NA	NA
BENZO(a)PYRENE	2.7E-3	1.0%	2.0E-10	7.30E+0	1.4E-9	2.3E-9	NA	NA
BENZO(b)FLUORANTHENE	2.8E-3	1.0%	2.0E-10	7.30E-1	1.5E-10	2.4E-9	NA	NA
BENZO(g,h,i)PERYLENE	2.4E-3	1.0%	1.7E-10	NA	NA	2.0E-9	NA	NA
BENZO(k)FLUORANTHENE	2.6E-3	1.0%	1.9E-10	7.30E-2	1.4E-11	2.2E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALA	3.5E-3	1.0%	2.5E-10	1.40E-2	3.5E-12	2.9E-9	2.00E-2	1.4E-7
BUTYLBENZYLPHTHALATE	2.8E-3	1.0%	2.0E-10	NA	NA	2.3E-9	2.00E+0	1.2E-9
CARBAZOLE	2.9E-3	1.0%	2.1E-10	2.00E-2	4.1E-12	2.4E-9	NA	NA
CHRYSENE	2.9E-3	1.0%	2.1E-10	7.30E-3	1.5E-12	2.5E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.2E-3	1.0%	1.6E-10	NA	NA	1.9E-9	1.00E+0	1.9E-9
DI-N-OCTYLPHTHALATE	2.9E-3	1.0%	2.1E-10	NA	NA	2.4E-9	2.00E-2	1.2E-7
DIELDRIN	2.2E-3	1.0%	1.6E-10	1.60E+1	2.5E-9	1.8E-9	5.00E-5	3.7E-5
DIETHYLPHTHALATE	2.4E-3	1.0%	1.7E-10	NA	NA	2.0E-9	8.00E+0	2.5E-10
ENDOSULFAN-I	1.9E-3	1.0%	1.4E-10	NA	NA	NA	NA	NA
ENDRIN	2.5E-3	1.0%	1.8E-10	NA	NA	2.1E-9	3.00E-4	7.0E-6
ENDRIN-ALDEHYDE	4.2E-3	1.0%	3.0E-10	NA	NA	3.6E-9	NA	NA
FLUORANTHENE	3.2E-3	1.0%	2.3E-10	NA	NA	2.7E-9	4.00E-1	6.7E-9
GAMMA-CHLORDANE	3.1E-3	1.0%	2.2E-10	NA	NA	2.6E-9	NA	NA
HEPTACHLOR	2.2E-3	1.0%	1.6E-10	4.50E+0	7.2E-10	1.9E-9	5.00E-4	3.7E-6
HEPTACHLOR-EPOXIDE	2.0E-3	1.0%	1.5E-10	9.10E+0	1.3E-9	1.7E-9	1.30E-5	1.3E-4
INDENO(1,2,3-cd)PYRENE	2.5E-3	1.0%	1.8E-10	7.30E-1	1.3E-10	2.1E-9	NA	NA
METHYLENE-CHLORIDE	2.0E-3	1.0%	1.5E-10	7.50E-3	1.1E-12	NA	6.00E-2	
NAPTHALENE	2.3E-3	1.0%	1.7E-10	NA	NA	1.9E-9	NA	NA
PHENANTHRENE	2.6E-3	1.0%	1.8E-10	NA	NA	2.1E-9	NA	NA
PYRENE	3.1E-3	1.0%	2.3E-10	NA	NA	2.6E-9	3.00E-1	8.8E-9
TETRACHLOROETHENE	2.0E-3	1.0%	1.4E-10	5.20E-2	7.4E-12	1.7E-9	1.00E-1	1.7E-8
TOLUENE	2.8E-3	1.0%	2.0E-10	NA	NA	2.3E-9	2.00E+0	1.2E-9
XYLENE	1.9E-3	1.0%	1.3E-10	NA	NA	1.6E-9	2.00E+0	7.8E-10
2,3,7,8-TCDD (Equiv)	3.0E-7	1.0%	2.2E-14	1.50E+5	3.2E-9	2.5E-13	NA	NA
TOTAL					**1.60E-6**			**0.0571**

NA : Toxicity criteria not available.
(*) SF derived using relative potencies (EPA 1993a)
(a) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Summary Intake Factor, cancer: 7.2E-6
Summary Intake Factor, noncancer: 8.4E-5

Source: Ecology and Environment, Inc., 1994

Table S.B-18
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Child Moton Elementary School RME Scenario: Inhalation of Indoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air	EF: exposure frequency
IR: inhalation rate	BW: body weight
ED: exposure duration	AT: averaging time
FI: fraction inhaled from contaminated source	

Exposure Factors:

CA*	–	(mg/m^3)
IR	17	(m^3/day)
ED	6	(years)
EF	180	(days/year)
FI	1	unitless
BW	30	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

Chemical	Air Concentration (mg/m^3)	Carcinogenic Effects: LADI (mg/kg-day)	Carcinogenic Effects: Inhalation SF (mg/kg-day)$^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: CDI (mg/kg-day)	Noncarcinogenic Effects: Inhalation RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
1,1,1-TRICHLOROETHANE	2.7E-2	6.4E-4	NA	NA	7.4E-3	NA	NA
1,2,4-TRIMETHYLBENZENE	6.0E-3	1.4E-4	NA	NA	1.7E-3	NA	NA
1,3,5-TRIMETHYLBENZENE	2.2E-3	5.3E-5	NA	NA	6.1E-4	NA	NA
1,4-DICHLOROBENZENE	1.6E-3	3.8E-5	NA	NA	4.4E-4	2.28E-1	1.9E-3
BENZENE	4.9E-3	1.2E-4	2.90E-2	3.4E-6	1.4E-3	NA	NA
CHLOROFORM	1.6E-3	3.7E-5	8.00E-2	3.0E-6	4.4E-4	NA	NA
CHLOROMETHANE	9.0E-4	2.2E-5	6.30E-3	1.4E-7	2.5E-4	NA	NA
ETHYLBENZENE	2.4E-3	5.8E-5	NA	NA	6.8E-4	2.85E-1	2.4E-3
FREON 11	4.4E-1	1.0E-2	NA	NA	1.2E-1	NA	NA
FREON 113	3.0E-1	7.2E-3	NA	NA	8.4E-2	8.57E+0	9.8E-3
FREON 12	4.7E-2	1.1E-3	NA	NA	1.3E-2	NA	NA
O-XYLENE	3.4E-3	8.0E-5	NA	NA	9.4E-4	NA	NA
STYRENE	1.4E-3	3.3E-5	NA	NA	3.9E-4	2.80E-1	1.4E-3
TOLUENE	1.5E-2	3.6E-4	NA	NA	4.2E-3	1.10E-1	3.8E-2
TOTAL				**6.54E-6**			**0.053**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.4E-2
Summary Intake Factor, noncancer: 2.8E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-19

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Child Moton Elementary School RME Scenario: Inhalation of Outdoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air
IR: inhalation rate
ED: exposure duration
FI: fraction inhaled from contaminated source
EF: exposure frequency
BW: body weight
AT: averaging time

Exposure Factors:

CA*	--	(mg/m^3)
IR	17	(m^3/day)
ED	6	(years)
EF	350	(days/year)
FI	1	unitless
BW	30	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,2,4-TRIMETHYLBENZEN	1.4E-3	6.7E-5	NA	NA	7.8E-4	NA	NA
BENZENE	2.6E-3	1.2E-4	2.90E-2	3.5E-6	1.4E-3	NA	NA
FREON 11	1.6E-3	7.3E-5	NA	NA	8.5E-4	NA	NA
FREON 12	2.3E-3	1.1E-4	NA	NA	1.2E-3	NA	NA
M,P-XYLENE	2.1E-3	1.0E-4	NA	NA	1.2E-3	NA	NA
O-XYLENE	8.7E-4	4.1E-5	NA	NA	4.7E-4	NA	NA
TOLUENE	3.3E-3	1.5E-4	NA	NA	1.8E-3	1.10E-1	1.6E-2
TOTAL				**3.50E-6**			**0.016169**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 4.7E-2
Summary Intake Factor, noncancer: 5.4E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-20
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Child Press Park RME Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times ED \times EF \times FI}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	–	(mg/kg)
IR	100	(mg/day)
ED	6	(years)
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	30	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	5.90E+3	1.6E-3	NA	NA	1.9E-2	NA	NA
ANTIMONY	5.97E+0	1.6E-6	NA	NA	1.9E-5	4.00E-4	4.77E-2
ARSENIC	3.71E+1	1.0E-5	1.75E+0	1.8E-5	1.2E-4	3.00E-4	3.96E-1
BARIUM	8.12E+2	2.2E-4	NA	NA	2.6E-3	7.00E-2	3.71E-2
BERYLLIUM	4.37E-1	1.2E-7	4.30E+0	5.1E-7	1.4E-6	5.00E-3	2.79E-4
CADMIUM	3.26E+0	8.9E-7	NA	NA	1.0E-5	5.00E-4	2.09E-2
COBALT	1.45E+1	4.0E-6	NA	NA	4.6E-5	NA	NA
COPPER	8.87E+2	2.4E-4	NA	NA	2.8E-3	3.70E-2	7.66E-2
CYANIDE	2.71E+0	7.4E-7	NA	NA	8.7E-6	2.00E-2	4.33E-4
IRON	1.04E+5	2.9E-2	NA	NA	3.3E-1	NA	NA
MERCURY	3.37E+0	9.2E-7	NA	NA	1.1E-5	3.00E-4	3.59E-2
NICKEL	7.70E+1	2.1E-5	NA	NA	2.5E-4	2.00E-2	1.23E-2
SILVER	6.95E+0	1.9E-6	NA	NA	2.2E-5	5.00E-3	4.44E-3
THALLIUM	8.61E-1	2.4E-7	NA	NA	2.8E-6	NA	NA
VANADIUM	3.13E+1	8.6E-6	NA	NA	1.0E-4	7.00E-3	1.43E-2
1,1,1-TRICHLOROETHANE	5.98E-3	1.6E-9	NA	NA	1.9E-8	NA	NA
1,1-DICHLOROETHENE	5.76E-3	1.6E-9	6.00E-1	9.5E-10	1.8E-8	9.00E-3	2.05E-6
1,2-DICHLOROETHENE (total)	5.99E-3	1.6E-9	NA	NA	1.9E-8	9.00E-3	2.13E-6
2-METHYLNAPHTHALENE	2.32E-1	6.4E-8	NA	NA	7.4E-7	NA	NA
4,4'-DDD	6.17E-3	1.7E-9	2.40E-1	4.1E-10	2.0E-8	NA	NA
4,4'-DDE	2.28E-2	6.2E-9	3.40E-1 (*)	2.1E-9	7.3E-8	NA	NA
4,4'-DDT	3.66E-2	1.0E-8	3.40E-1	3.4E-9	1.2E-7	5.00E-4	2.34E-4
ACENAPHTHENE	3.09E-1	8.5E-8	NA	NA	9.9E-7	6.00E-1	1.64E-6
ACENAPHTHYLENE	2.22E-1	6.1E-8	NA	NA	7.1E-7	NA	NA
ACETONE	9.25E-3	2.5E-9	NA	NA	3.0E-8	1.00E+0	2.96E-8
ALDRIN	1.19E-3	3.3E-10	1.70E+1 (*)	5.6E-9	3.8E-9	3.00E-5	1.27E-4
ALPHA-CHLORDANE	1.27E-1	3.5E-8	NA	NA	4.1E-7	NA	NA
ANTHRACENE	2.01E-1	5.5E-8	NA	NA	6.4E-7	3.00E+0	2.14E-7
AROCLOR-1260	4.55E-2	1.2E-8	NA	NA	1.5E-7	NA	NA
BENZO(a)ANTHRACENE	3.37E-1	9.2E-8	7.30E-1 (*)	6.7E-8	1.1E-6	NA	NA
BENZO(a)PYRENE	3.65E-1	1.0E-7	7.30E+0	7.3E-7	1.2E-6	NA	NA
BENZO(b)FLUORANTHENE	5.14E-1	1.4E-7	7.30E-1 (*)	1.0E-7	1.6E-6	NA	NA
BENZO(g,h,i)PERYLENE	3.03E-1	8.3E-8	NA	NA	9.7E-7	NA	NA
BENZO(k)FLUORANTHENE	3.08E-1	8.4E-8	7.30E-2 (*)	6.2E-9	9.9E-7	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	6.9E-8	NA	NA	8.0E-7	2.00E+0	4.02E-7
CARBAZOLE	2.25E-1	6.2E-8	2.00E-2	1.2E-9	7.2E-7	NA	NA
CHRYSENE	4.15E-1	1.1E-7	7.3E-3	8.3E-10	1.3E-6	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	7.5E-8	NA	NA	8.7E-7	1.00E+0	8.70E-7
DI-N-OCTYLPHTHALATE	1.75E-1	4.8E-8	NA	NA	5.6E-7	2.00E-2	2.80E-5
DIBENZ(a,h)ANTHRACENE	1.93E-1	5.3E-8	7.30E+0 (*)	3.9E-7	6.2E-7	NA	NA
DIBENZOFURAN	2.14E-1	5.9E-8	NA	NA	6.8E-7	NA	NA
DIELDRIN	8.77E-3	2.4E-9	1.6E+1	3.8E-8	2.8E-8	5.00E-5	5.61E-4
ENDOSULFAN-II	2.80E-3	7.7E-10	NA	NA	9.0E-9	NA	NA
ENDRIN	1.17E-2	3.2E-9	NA	NA	3.7E-8	3.00E-4	1.24E-4
ENDRIN-ALDEHYDE	2.86E-2	7.8E-9	NA	NA	9.2E-8	NA	NA
FLUORANTHENE	6.36E-1	1.7E-7	NA	NA	2.0E-6	4.00E-1	5.08E-6
FLUORENE	2.18E-1	6.0E-8	NA	NA	7.0E-7	4.00E-1	1.74E-6
GAMMA-CHLORDANE	1.19E-1	3.3E-8	NA	NA	3.8E-7	NA	NA
HEPTACHLOR	3.59E-3	9.8E-10	4.5E+0	4.4E-9	1.1E-8	5.00E-4	2.29E-5
HEPTACHLOR-EPOXIDE	1.20E-2	3.3E-9	9.1E+0	3.0E-8	3.8E-8	1.30E-5	2.95E-3
INDENO(1,2,3-cd)PYRENE	2.72E-1	7.4E-8	7.30E-1 (*)	5.4E-8	8.7E-7	NA	NA
METHOXYCHLOR	1.34E-2	3.7E-9	NA	NA	4.3E-8	5.00E-3	8.53E-6
METHYLENE-CHLORIDE	8.51E-3	2.3E-9	7.5E-3	1.7E-11	2.7E-8	6.00E-2	4.53E-7
NAPTHALENE	2.12E-1	5.8E-8	NA	NA	6.8E-7	NA	NA
PHENANTHRENE	3.09E-1	8.5E-8	NA	NA	9.9E-7	NA	NA
PYRENE	5.77E-1	1.6E-7	NA	NA	1.8E-6	3.00E-1	6.15E-6
TETRACHLOROETHENE	5.83E-3	1.6E-9	5.2E-2	8.3E-11	1.9E-8	1.00E-1	1.86E-7
TOLUENE	7.84E-3	2.1E-9	NA	NA	2.5E-8	2.00E+0	1.25E-8
XYLENE	5.78E-3	1.6E-9	NA	NA	1.8E-8	2.00E+0	9.24E-9
beta-BHC	1.28E-3	3.5E-10	NA	NA	4.1E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.79E+0	4.9E-7	1.4E-2	6.9E-9	5.7E-6	2.00E-2	2.86E-4
delta-BHC	1.46E-3	4.0E-10	NA	NA	4.7E-9	NA	NA
2,3,7,8-TCDD (Equiv)	8.66E-5	2.4E-11	1.5E+5	3.6E-6	2.8E-10	NA	NA
TOTAL				**2.33E-5**			**0.65**

(*) SF derived using relative potencies (EPA 1993a)

CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.7E-7
Summary Intake Factor, noncancer: 3.2E-6

Source: Ecology and Environment, Inc., 1994

Table S.B-21
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Child Press Park RME Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	AF: adherence factor
	ABS: absorption factor
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time
CS: chemical conc. in soil	CF: conversion factor

Exposure Factors:

CS*	–	(mg/kg)
DA_{event}*	–	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	–	(unitless)
ED	6	(years)
EF	350	(days/year)
SA	2620	(cm^2)
CF	1E-6	(kg/mg)
BW	30	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	Carcinogenic Effects: DAD (mg/kg-day)	Carcinogenic Effects: Dermal SF $(mg/kg\text{-}day)^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: DAD (mg/kg-day)	Noncarcinogenic Effects: Subchronic Dermal RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
ALUMINUM	5.90E+3	0.1%	4.2E-5	NA	NA	4.9E-4	NA	NA
ANTIMONY	5.97E+0	0.1%	4.3E-8	NA	NA	5.0E-7	2.00E-5 (b)	2.5E-2
ARSENIC	3.71E+1	0.1%	2.7E-7	3.50E+1 (a)	9.3E-6	3.1E-6	1.50E-5 (b)	2.1E-1
BARIUM	8.12E+2	0.1%	5.8E-6	NA	NA	6.8E-5	3.50E-3 (b)	1.9E-2
BERYLLIUM	4.37E-1	0.1%	3.1E-9	8.60E+1 (a)	2.7E-7	3.7E-8	2.50E-4 (b)	1.5E-4
COBALT	1.45E+1	0.1%	1.0E-7	NA	NA	1.2E-6	NA	NA
COPPER	8.87E+2	0.1%	6.4E-6	NA	NA	7.4E-5	1.85E-3 (b)	4.0E-2
CYANIDE	2.71E+0	0.1%	1.9E-8	NA	NA	2.3E-7	1.00E-3 (b)	2.3E-4
IRON	1.04E+5	0.1%	7.5E-4	NA	NA	8.7E-3	NA	NA
MERCURY	3.37E+0	0.1%	2.4E-8	NA	NA	2.8E-7	1.50E-5 (b)	1.9E-2
NICKEL	7.70E+1	0.1%	5.5E-7	NA	NA	6.4E-6	1.00E-3 (b)	6.4E-3
SILVER	6.95E+0	1%	5.0E-7	NA	NA	5.8E-6	5.00E-3	1.2E-3
THALLIUM	8.61E-1	1%	6.2E-8	NA	NA	7.2E-7	NA	NA
VANADIUM	3.13E+1	1%	2.2E-6	NA	NA	2.6E-5	7.00E-3	3.7E-3
1,1,1-TRICHLOROETHANE	5.98E-3	1%	4.3E-10	NA	NA	5.0E-9	NA	NA
1,1-DICHLOROETHENE	5.76E-3	1%	4.1E-10	6.00E-1	2.5E-10	4.8E-9	9.00E-3	5.4E-7
1,2-DICHLOROETHENE (total)	5.99E-3	1%	4.3E-10	NA	NA	5.0E-9	9.00E-3	5.6E-7
2-METHYLNAPHTHALENE	2.32E-1	1%	1.7E-8	NA	NA	1.9E-7	NA	NA
4,4'-DDT	3.66E-2	1%	2.6E-9	3.40E-1	8.9E-10	3.1E-8	5.00E-4	6.1E-5
ACENAPHTHENE	3.09E-1	1%	2.2E-8	NA	NA	2.6E-7	6.00E-1	4.3E-7
ACENAPHTHYLENE	2.22E-1	1%	1.5E-8	NA	NA	1.9E-7	NA	NA
ALDRIN	1.19E-3	1%	8.6E-11	NA	NA	1.0E-9	3.00E-5	3.3E-5
BENZO(b)FLUORANTHENE	5.14E-1	1%	3.7E-8	7.30E-1	2.7E-8	4.3E-7	NA	NA
BENZO(g,h,i)PERYLENE	3.03E-1	1%	2.2E-8	NA	NA	2.5E-7	NA	NA
BUTYLBENZYLPHTHALATE	2.52E-1	1%	1.8E-8	NA	NA	2.1E-7	2.00E+0	1.1E-7
CARBAZOLE	2.25E-1	1%	1.6E-8	2.00E-2	3.2E-10	1.9E-7	NA	NA
CHRYSENE	4.15E-1	1%	3.0E-8	7.30E-3	2.2E-10	3.5E-7	NA	NA
DI-N-BUTYLPHTHALATE	2.72E-1	1%	2.0E-8	NA	NA	2.3E-7	1.00E+0	NA
DI-N-OCTYLPHTHALATE	1.75E-1	1%	1.3E-8	NA	NA	1.5E-7	2.00E-2	NA
DIBENZ(a,h)ANTHRACENE	1.93E-1	1%	1.4E-8	7.30E+0	1.0E-7	1.6E-7	NA	NA
DIBENZOFURAN	2.14E-1	1%	1.5E-8	NA	NA	1.8E-7	NA	NA
DIELDRIN	8.77E-3	1%	6.3E-10	1.60E+1	1.0E-8	7.3E-9	5.00E-5	1.5E-4
ENDRIN	1.17E-2	1%	8.4E-10	NA	NA	9.8E-9	3.00E-4	3.3E-5
ENDRIN ALDEHYDE	2.86E-2	1%	2.1E-9	NA	NA	2.4E-8	NA	NA
FLUORANTHENE	6.36E-1	1%	4.6E-8	NA	NA	5.3E-7	4.00E-1	1.3E-6
FLUORENE	2.18E-1	1%	1.6E-8	NA	NA	1.8E-7	4.00E-1	4.6E-7
HEPTACHLOR	3.59E-3	1%	2.6E-10	4.50E+0	1.2E-9	3.0E-9	5.00E-4	6.0E-6
HEPTACHLOR-EPOXIDE	1.20E-2	1%	8.6E-10	9.10E+0	7.8E-9	1.0E-8	1.30E-5	7.7E-4
INDENO(1,2,3-cd)PYRENE	2.72E-1	1%	2.0E-8	7.30E-1	1.4E-8	2.3E-7	NA	NA
NAPTHALENE	2.12E-1	1%	1.5E-8	NA	NA	1.8E-7	NA	NA
PHENANTHRENE	3.09E-1	1%	2.2E-8	NA	NA	2.6E-7	NA	NA
PYRENE	5.77E-1	1%	4.1E-8	NA	NA	4.8E-7	3.00E-1	1.6E-6
TETRACHLOROETHENE	5.83E-3	1%	4.2E-10	5.20E-2	2.2E-11	4.9E-9	1.00E-1	4.9E-8
TOLUENE	7.84E-3	1%	5.6E-10	NA	NA	6.6E-9	2.00E+0	3.3E-9
XYLENE	5.78E-3	1%	4.1E-10	NA	NA	4.8E-9	2.00E+0	2.4E-9
beta-BHC	1.28E-3	1%	9.2E-11	NA	NA	1.1E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.79E+0	1%	1.3E-7	1.40E-2	1.8E-9	1.5E-8	2.00E-2	7.5E-5
delta-BHC	1.46E-3	1%	1.1E-10	NA	NA	1.2E-9	NA	NA
2,3,7,8-TCDD (Equiv)	8.66E-5	1%	6.2E-12	1.50E+5	9.3E-7	7.3E-11	NA	NA
TOTAL					1.07E-5			0.324

NA : Toxicity criteria not available.
(*) SF derived using relative potencies (EPA 1993a)

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Source: Ecology and Environment, Inc., 1994

Summary Intake Factor, cancer: 7.2E-6
Summary Intake Factor, noncancer: 8.4E-5

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Table S.B-22

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current RME Worker Scenario - Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times FI \times ED \times EF}{BW \times AT}$$

CS: chemical conc. in soil
CF: conversion factor
IR: ingestion rate
BW: body weight
ED: exposure duration
AT: averaging time
EF: exposure frequency
FI: fraction ingested

Exposure Factors:

CS*	–	(mg/kg)
IR	50	(mg/day)
ED	25	(years)
EF	250	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	9,125	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	5.77E+3	1.0E-3	NA	NA	2.8E-3	NA	NA
ANTIMONY	8.54E+0	1.5E-6	NA	NA	4.2E-6	4.00E-4	1.04E-2
ARSENIC	1.70E+1	3.0E-6	1.75E+0	5.2E-6	8.3E-6	3.00E-4	2.77E-2
BARIUM	4.28E+2	7.5E-5	NA	NA	2.1E-4	7.00E-2	2.99E-3
BERYLLIUM	3.06E-1	5.3E-8	4.30E+0	2.3E-7	1.5E-7	5.00E-3	2.99E-5
CADMIUM	4.01E+0	7.0E-7	NA	NA	2.0E-6	5.00E-4	3.92E-3
COBALT	1.03E+1	1.8E-6	NA	NA	5.0E-6	6.00E-2	8.40E-5
COPPER	3.71E+2	6.5E-5	NA	NA	1.8E-4	3.70E-2	4.90E-3
CYANIDE	9.22E-1	1.6E-7	NA	NA	4.5E-7	2.00E-2	2.26E-5
IRON	5.29E+4	9.2E-3	NA	NA	2.6E-2	NA	NA
MERCURY	1.05E+0	1.8E-7	NA	NA	5.1E-7	3.00E-4	1.70E-3
NICKEL	3.65E+1	6.4E-6	NA	NA	1.8E-5	2.00E-2	8.93E-4
SILVER	4.00E+0	7.0E-7	NA	NA	2.0E-6	5.00E-3	3.91E-4
THALLIUM	5.50E-1	9.6E-8	NA	NA	2.7E-7	NA	NA
VANADIUM	1.80E+1	3.2E-6	NA	NA	8.8E-6	7.00E-3	1.26E-3
1,1,1-TRICHLOROETHANE	6.47E-3	1.1E-9	NA	NA	3.2E-9	NA	NA
1,1-DICHLOROETHENE	6.47E-3	1.1E-9	6.00E-1	6.8E-10	3.2E-9	9.00E-3	3.52E-7
1,2-DICHLOROETHENE (total)	6.41E-3	1.1E-9	NA	NA	3.1E-9	9.00E-3	3.48E-7
1,4-DICHLOROBENZENE	3.24E-1	5.7E-8	2.40E-2	1.4E-9	1.6E-7	NA	NA
2-BUTANONE	1.00E-2	1.7E-9	NA	NA	4.9E-9	NA	NA
2-METHYLNAPHTHALENE	3.57E-1	6.2E-8	NA	NA	1.7E-7	NA	NA
4,4'-DDD	2.84E-2	5.0E-9	2.40E-1	1.2E-9	1.4E-8	NA	NA
4,4'-DDE	4.81E-2	8.4E-9	3.40E-1	2.9E-9	2.4E-8	NA	NA
4,4'-DDT	3.39E-2	5.9E-9	3.40E-1	2.0E-9	1.7E-8	5.00E-4	3.32E-5
ACENAPHTHENE	3.72E-1	6.5E-8	NA	NA	1.8E-7	6.00E-2	3.03E-6
ACENAPHTHYLENE	3.04E-1	5.3E-8	NA	NA	1.5E-7	NA	NA
ACETONE	2.93E-2	5.1E-9	NA	NA	1.4E-8	1.00E-1	1.44E-7
ALDRIN	2.99E-3	5.2E-10	1.70E+1	8.9E-9	1.5E-9	3.00E-5	4.88E-5
alpha-BHC	1.44E-3	2.5E-10	NA	NA	7.0E-10	NA	NA
ALPHA-CHLORDANE	6.89E-2	1.2E-8	NA	NA	3.4E-8	NA	NA
ANTHRACENE	4.50E-1	7.9E-8	NA	NA	2.2E-7	3.00E-1	7.34E-7
AROCLOR-1260	7.90E-2	1.4E-8	NA	NA	3.9E-8	NA	NA
BENZO(a)ANTHRACENE	1.25E+0	2.2E-7	7.30E-1 (*)	1.6E-7	6.1E-7	NA	NA
BENZO(a)PYRENE	1.20E+0	2.1E-7	7.30E+0 (*)	1.5E-6	5.9E-7	NA	NA
BENZO(b)FLUORANTHENE	1.51E+0	2.6E-7	7.30E-1 (*)	1.9E-7	7.4E-7	NA	NA
BENZO(g,h,i)PERYLENE	8.61E-1	1.5E-7	NA	NA	4.2E-7	NA	NA
BENZO(k)FLUORANTHENE	1.03E+0	1.8E-7	7.30E-2 (*)	1.3E-8	5.0E-7	NA	NA
bis(2-ETHYLHEXYL)PHTHALAT	1.70E+0	3.0E-7	1.40E-2	4.1E-9	8.3E-7	2.00E-2	4.15E-5
BUTYLBENZYLPHTHALATE	4.00E-1	7.0E-8	NA	NA	2.0E-7	2.00E-1	9.79E-7
CARBAZOLE	3.33E-1	5.8E-8	2.00E-2	1.2E-9	1.6E-7	NA	NA
CARBON-DISULFIDE	6.22E-3	1.1E-9	NA	NA	3.0E-9	1.00E-1	3.04E-8
CARBON-TETRACHLORIDE	6.42E-3	1.1E-9	1.30E-1	1.5E-10	3.1E-9	7.00E-4	4.48E-6
CHLOROFORM	6.12E-3	1.1E-9	6.10E-3	6.5E-12	3.0E-9	1.00E-2	3.00E-7
CHRYSENE	1.26E+0	2.2E-7	7.30E-3 (*)	1.6E-9	6.1E-7	NA	NA
delta-BHC	2.47E-3	4.3E-10	NA	NA	1.2E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.73E-1	4.8E-8	NA	NA	1.3E-7	1.00E-1	1.33E-6
DI-N-OCTYLPHTHALATE	3.97E-1	6.9E-8	NA	NA	1.9E-7	2.00E-2	9.70E-6
DIBENZ(a,h)ANTHRACENE	3.62E-1	6.3E-8	7.30E+0 (*)	4.6E-7	1.8E-7	NA	NA
DIBENZOFURAN	3.52E-1	6.2E-8	NA	NA	1.7E-7	4.00E-3	4.31E-5
DIELDRIN	1.21E-2	2.1E-9	1.60E+1	3.4E-8	5.9E-9	5.00E-5	1.18E-4
DIETHYLPHTHALATE	3.38E-1	5.9E-8	NA	NA	1.7E-7	8.00E-1	2.07E-7
ENDOSULFAN-II	5.94E-3	1.0E-9	NA	NA	2.9E-9	NA	NA
ENDOSULFAN-SULFATE	3.64E-3	6.4E-10	NA	NA	1.8E-9	NA	NA
ENDRIN	1.54E-2	2.7E-9	NA	NA	7.6E-9	3.00E-4	2.52E-5
ENDRIN-ALDEHYDE	1.41E-2	2.5E-9	NA	NA	6.9E-9	NA	NA
ENDRIN-KETONE	4.02E-3	7.0E-10	NA	NA	2.0E-9	NA	NA
ETHYLBENZENE	6.51E-3	1.1E-9	NA	NA	3.2E-9	1.00E-1	3.19E-8
FLUORANTHENE	2.11E+0	3.7E-7	NA	NA	1.0E-6	4.00E-2	2.58E-5
FLUORENE	3.72E-1	6.5E-8	NA	NA	1.8E-7	4.00E-2	4.55E-6
GAMMA-CHLORDANE	7.02E-2	1.2E-8	NA	NA	3.4E-8	NA	NA
HEPTACHLOR	3.02E-3	5.3E-10	4.50E+0	2.4E-9	1.5E-9	5.00E-4	2.96E-6
HEPTACHLOR-EPOXIDE	1.08E-2	1.9E-9	9.10E+0	1.7E-8	5.3E-9	1.30E-5	4.07E-4
INDENO(1,2,3-cd)PYRENE	7.67E-1	1.3E-7	7.30E-1 (*)	9.8E-8	3.8E-7	NA	NA
METHOXYCHLOR	1.80E-2	3.1E-9	NA	NA	8.8E-9	5.00E-3	1.76E-6
METHYLENE-CHLORIDE	1.98E-2	3.5E-9	7.50E-3	2.6E-11	9.7E-9	6.00E-2	1.62E-7
NAPTHALENE	4.08E-1	7.1E-8	NA	NA	2.0E-7	4.00E-2	4.99E-6
PHENANTHRENE	1.32E+0	2.3E-7	NA	NA	6.5E-7	NA	NA
PYRENE	1.90E+0	3.3E-7	NA	NA	9.3E-7	3.00E-2	3.10E-5
TETRACHLOROETHENE	9.89E-3	1.7E-9	5.20E-2	9.0E-11	4.8E-9	1.00E-2	4.84E-7
TOLUENE	1.00E-2	1.8E-9	NA	NA	4.9E-9	2.00E-1	2.45E-8
TRICHLOROETHENE	6.24E-3	1.1E-9	1.10E-2	1.2E-11	3.1E-9	NA	NA
XYLENE	1.14E-2	2.0E-9	NA	NA	5.6E-9	2.00E+0	2.79E-9
2,3,7,8-TCDD (Equiv)	2.28E-4	4.0E-11	1.50E+5	6.0E-6	1.1E-10	NA	NA
TOTAL				1.39E-5			0.055

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.7E-7
Summary Intake Factor, noncancer: 4.9E-7

Source: Ecology and Environment, Inc., 1994

Table S.B-23
AGRICULTURAL LANDFILL SITE: HUMAN HEALTH RISK ASSESSMENT
Current Average Work Scenario - Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times FI \times ED \times EF}{BW \times AT}$$

CS: chemical conc. in soil
IR: ingestion rate
ED: exposure duration
EF: exposure frequency
FI: fraction ingested
CF: conversion factor
BW: body weight
AT: averaging time

Exposure Factors:

CS*	–	(mg/kg)
IR	50	(mg/day)
ED	9	(years)
EF	40	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

Chemical	Exposure Point Concentration (mg/kg)	Carcinogenic Effects: LADI (mg/kg-day)	Carcinogenic Effects: Oral SF (mg/kg-day)-1	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: CDI (mg/kg-day)	Noncarcinogenic Effects: Oral RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
ALUMINUM	5.77E+3	5.8E-5	NA	NA	4.5E-4	NA	NA
ANTIMONY	8.54E+0	8.8E-8	NA	NA	6.7E-7	4.00E-4	1.67E-3
ARSENIC	.70E+1	1.7E-7	1.75E+0	3.0E-7	1.3E-6	3.00E-4	4.43E-3
BARIUM	4.28E+2	4.3E-6	NA	NA	3.3E-5	7.00E-2	4.78E-4
BERYLLIUM	3.06E-1	3.1E-9	4.30E+0	1.3E-8	2.4E-8	5.00E-3	4.78E-6
CADMIUM	4.01E+0	4.0E-8	NA	NA	3.1E-7	5.00E-4	6.27E-4
COBALT	1.03E+1	1.0E-7	NA	NA	8.1E-7	6.00E-2	1.34E-5
COPPER	3.71E+2	3.7E-6	NA	NA	2.9E-5	3.70E-2	7.84E-4
CYANIDE	9.22E-1	9.3E-9	NA	NA	7.2E-8	2.00E-2	3.61E-6
IRON	5.29E+4	5.3E-4	NA	NA	4.1E-3	NA	NA
MERCURY	1.05E+0	1.1E-8	NA	NA	8.2E-8	3.00E-4	2.73E-4
NICKEL	3.65E+1	3.7E-7	NA	NA	2.9E-6	2.00E-2	1.43E-4
SILVER	4.00E+0	4.0E-8	NA	NA	3.1E-7	5.00E-3	6.26E-5
THALLIUM	5.50E-1	5.5E-9	NA	NA	4.3E-8	NA	NA
VANADIUM	1.80E+1	1.8E-7	NA	NA	1.4E-6	7.00E-3	2.02E-4
1,1,1-TRICHLOROETHANE	6.47E-3	6.5E-11	NA	NA	5.1E-10	NA	NA
1,1-DICHLOROETHENE	6.47E-3	6.5E-11	6.00E-1	3.9E-11	5.1E-10	9.00E-3	5.63E-8
1,2-DICHLOROETHENE (total)	6.41E-3	6.4E-11	NA	NA	5.0E-10	9.00E-3	5.57E-8
1,4-DICHLOROBENZENE	3.24E-1	3.3E-9	2.40E-2	7.8E-11	2.5E-8	NA	NA
2-BUTANONE	1.00E-2	1.0E-10	NA	NA	7.8E-10	NA	NA
2-METHYLNAPHTHALENE	3.57E-1	3.6E-9	NA	NA	2.8E-8	NA	NA
4,4'-DDD	2.84E-2	2.9E-10	2.40E-1	6.9E-11	2.2E-9	NA	NA
4,4'-DDE	4.81E-2	4.8E-10	3.40E-1	1.6E-10	3.8E-9	NA	NA
4,4'-DDT	3.39E-2	3.4E-10	3.40E-1	1.2E-10	2.7E-9	5.00E-4	5.31E-6
ACENAPHTHENE	3.72E-1	3.7E-9	NA	NA	2.9E-8	6.00E-2	4.85E-7
ACENAPHTHYLENE	3.04E-1	3.1E-9	NA	NA	2.4E-8	NA	NA
ACETONE	2.93E-2	3.0E-10	NA	NA	2.3E-9	1.00E-1	2.30E-8
ALDRIN	2.99E-3	3.0E-11	1.70E+1	5.1E-10	2.3E-10	3.00E-5	7.81E-6
alpha-BHC	1.44E-3	1.4E-11	NA	NA	1.1E-10	NA	NA
ALPHA-CHLORDANE	6.89E-2	6.9E-10	NA	NA	5.4E-9	NA	NA
ANTHRACENE	4.50E-1	4.5E-9	NA	NA	3.5E-8	3.00E-1	1.18E-7
AROCLOR-1260	7.90E-3	8.0E-10	NA	NA	6.2E-9	NA	NA
BENZO(a)ANTHRACENE	1.25E-1	1.3E-8	30E-1 (*)	8.9E-8	9.7E-8	NA	NA
BENZO(a)PYRENE	1.20E+0	1.2E-8	7.30E+0 (*)	8.9E-8	9.4E-8	NA	NA
BENZO(b)FLUORANTHENE	1.51E+0	1.5E-8	7.30E-1	1.1E-8	1.2E-7	NA	NA
BENZO(g,h,i)PERYLENE	8.61E-1	8.7E-9	NA	NA	6.7E-8	NA	NA
BENZO(k)FLUORANTHENE	1.03E+0	1.0E-8	7.30E-2 (*)	7.6E-10	8.1E-8	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.70E+0	1.7E-8	1.40E-2	2.4E-10	1.3E-7	2.00E-2	6.64E-6
BUTYLBENZYLPHTHALATE	4.00E-1	4.0E-9	NA	NA	3.1E-8	2.00E-1	1.57E-7
CARBAZOLE	3.33E-1	3.3E-9	2.00E-2	6.7E-11	2.6E-8	NA	NA
CARBON-DISULFIDE	6.22E-3	6.3E-11	NA	NA	4.9E-10	1.00E-1	4.87E-9
CARBON-TETRACHLORIDE	6.42E-3	6.5E-11	1.30E-1	8.4E-12	5.0E-10	7.00E-4	7.18E-7
CHLOROFORM	6.12E-3	6.2E-11	6.10E-3	3.8E-13	4.8E-10	1.00E-2	4.79E-8
CHRYSENE	1.26E+0	1.3E-8	7.30E-3 (*)	9.2E-11	9.8E	NA	NA
delta-BHC	2.47E-3	2.5E-11	NA	NA	1.9E-10	NA	NA
DI-N-BUTYLPHTHALATE	2.73E-1	2.7E-9	NA	NA	2.1E-8	1.00E-1	2.14E-7
DI-N-OCTYLPHTHALATE	3.97E-1	4.0E-9	NA	NA	3.1E-8	2.00E-2	1.55E-6
DIBENZ(a,h)ANTHRACENE	3.62E-1	3.6E-9	7.30E+0 (*)	2.7E-8	2.8E-8	NA	NA
DIBENZOFURAN	3.52E-1	3.5E-9	NA	NA	2.8E-8	4.00E-3	6.89E-6
DIELDRIN	1.21E-2	1.2E-10	1.60E+1	1.9E-9	9.4E-10	5.00E-5	1.89E-5
DIETHYLPHTHALATE	3.38E-1	3.4E-9	NA	NA	2.6E-8	8.00E-1	3.31E-8
ENDOSULFAN-II	5.94E-3	6.0E-11	NA	NA	4.6E-10	NA	NA
ENDOSULFAN-SULFATE	3.64E-3	3.7E-11	NA	NA	2.8E-10	NA	NA
ENDRIN	1.54E-2	1.6E-10	NA	NA	1.2E-9	3.00E-4	4.03E-6
ENDRIN-ALDEHYDE	1.41E-2	1.4E-10	NA	NA	1.1E-9	NA	NA
ENDRIN-KETONE	4.02E-3	4.0E-11	NA	NA	3.1E-10	NA	NA
ETHYLBENZENE	6.51E-3	6.6E-11	NA	NA	5.1E-10	1.00E-1	5.10E-9
FLUORANTHENE	2.11E+0	2.1E-8	NA	NA	1.7E-7	4.00E-2	4.13E-6
FLUORENE	3.72E-1	3.7E-9	NA	NA	2.9E-8	4.00E-2	7.28E-7
GAMMA-CHLORDANE	7.02E-2	7.1E-10	NA	NA	5.5E-9	NA	NA
HEPTACHLOR	3.02E-3	3.0E-11	4.50E+0	1.4E-10	2.4E-10	5.00E-4	4.74E-7
HEPTACHLOR-EPOXIDE	1.08E-2	1.1E-10	9.10E+0	9.9E-10	8.5E-10	1.30E-5	6.52E-5
INDENO(1,2,3-cd)PYRENE	7.67E-1	7.7E-9	7.30E-1 (*)	5.6E-9	6.0E-8	NA	NA
METHOXYCHLOR	1.80E-2	1.8E-10	NA	NA	1.4E-9	5.00E-3	2.82E-7
METHYLENE-CHLORIDE	1.98E-2	2.0E-10	7.50E-3	1.5E-12	1.6E-9	6.00E-2	2.58E-8
NAPTHALENE	4.08E-1	4.1E-9	NA	NA	3.2E-8	4.00E-2	7.98E-7
PHENANTHRENE	1.32E+0	1.3E-8	NA	NA	1.0E-7	NA	NA
PYRENE	1.90E+0	1.9E-8	NA	NA	1.5E-7	3.00E-2	4.95E-6
TETRACHLOROETHENE	9.89E-3	1.0E-10	5.20E-2	5.2E-12	7.7E-10	1.00E-2	7.74E-8
TOLUENE	1.00E-2	1.0E-10	NA	NA	7.9E-10	2.00E-1	3.93E-9
TRICHLOROETHENE	6.24E-3	6.3E-11	1.10E-2	6.9E-13	4.9E-10	NA	NA
XYLENE	1.14E-2	1.1E-10	NA	NA	8.9E-10	2.00E+0	4.46E-10
2,3,7,8-TCDD (Equiv)	2.28E-4	2.3E-12	1.50E+5	3.4E-7	1.8E-11	NA	NA
TOTAL				**8.02E-7**			**0.009**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.7E-7
Summary Intake Factor, noncancer: 4.9E-7

Table S.B-24
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current Industrial RME Scenario - Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose
DA_{event}: dose absorbed per unit area per event
ED: exposure duration
EF: exposure frequency
CF: conversion factor
SA: skin surface area
AF: adherence factor
ABS: absorption factor
BW: body weight
AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	--	(unitless)
ED	25	(years)
EF	250	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	9,125	(days) noncancer

* - Chemical specific value
** - 0.1 for metals; 1% for organics

Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	Carcinogenic Effects: LADI (mg/kg-day)	Dermal SF (mg/kg-day)$^{-1}$	Cancer Risk	Noncarcinogenic Effects: CDI (mg/kg-day)	Dermal RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	5.77E+3	0.1%	1.0E-4	NA	NA	2.8E-4	NA	NA
ANTIMONY	8.54E+0	0.1%	1.5E-7	NA	NA	4.2E-7	2.00E-5 (b)	2.1E-2
ARSENIC	1.70E+1	0.1%	3.0E-7	3.50E+1 (a)	1.0E-5	8.3E-7	1.50E-5 (b)	5.5E-2
BARIUM	4.28E+2	0.1%	7.5E-6	NA	NA	2.1E-5	3.50E-3 (b)	6.0E-3
BERYLLIUM	3.06E-1	0.1%	5.3E-9	8.60E+1 (a)	4.6E-7	1.5E-8	2.50E-4 (b)	6.0E-5
CADMIUM	4.01E+0	0.1%	7.0E-8	NA	NA	2.0E-7	2.50E-5 (b)	7.8E-3
COBALT	1.03E+1	0.1%	1.8E-7	NA	NA	5.0E-7	3.00E-3 (b)	1.7E-4
COPPER	3.71E+2	0.1%	6.5E-6	NA	NA	1.8E-5	1.85E-3 (b)	9.8E-3
CYANIDE	9.22E-1	0.1%	1.6E-8	NA	NA	4.5E-8	1.00E-3 (b)	4.5E-5
IRON	5.29E+4	0.1%	9.2E-4	NA	NA	2.6E-3	NA	NA
MERCURY	1.05E+0	0.1%	1.8E-8	NA	NA	5.1E-8	1.50E-5 (b)	3.4E-3
NICKEL	3.65E+1	0.1%	6.4E-7	NA	NA	1.8E-6	1.00E-3 (b)	1.8E-3
SILVER	4.00E+0	0.1%	7.0E-8	NA	NA	2.0E-7	5.00E-3	3.9E-5
THALLIUM	5.50E-1	0.1%	9.6E-9	NA	NA	2.7E-8	NA	NA
VANADIUM	1.80E+1	0.1%	3.2E-7	NA	NA	8.8E-7	7.00E-3	1.3E-4
1,1,1-TRICHLOROETHANE	6.47E-3	1.0%	1.1E-9	NA	NA	3.2E-9	NA	NA
1,1-DICHLOROETHENE	6.47E-3	1.0%	1.1E-9	6.00E-1	6.8E-10	3.2E-9	9.00E-3	3.5E-7
1,2-DICHLOROETHENE (total)	6.41E-3	1.0%	1.1E-9	NA	NA	3.1E-9	9.00E-3	3.5E-7
1,4-DICHLOROBENZENE	3.24E-1	1.0%	5.7E-8	2.40E-1	1.4E-9	1.6E-7	NA	NA
2-BUTANONE	1.00E-2	1.0%	1.7E-9	NA	NA	4.9E-9	NA	NA
2-METHYLNAPHTHALENE	3.57E-1	1.0%	6.2E-8	NA	NA	1.7E-7	NA	NA
4,4-DDT	3.39E-2	1.0%	5.9E-9	3.40E	2.0E-9	1.7E-8	5.00E-4	3.3E-5
ACENAPHTHENE	3.72E-1	1.0%	6.5E-8	NA	NA	1.8E-7	6.00E-2	3.0E-6
ACENAPHTHYLENE	3.04E-1	1.0%	5.3E-8	NA	NA	1.5E-7	NA	NA
ACETONE	2.93E-2	1.0%	5.1E-9	NA	NA	1.4E-8	1.00E-1	1.4E-7
alpha-BHC	1.44E-3	1.0%	2.5E-10	NA	NA	7.0E-10	NA	NA
BENZO(b)FLUORANTHENE	1.51E+0	1.0%	2.6E-7	7.30E-1	1.9E-7	7.4E-7	NA	NA
BENZO(g,h,i)PERYLENE	8.61E-1	1.0%	1.5E-7	NA	NA	4.2E-7	NA	NA
BENZO(k)FLUORANTHENE	1.03E+0	1.0%	1.8E-7	7.30E-2	1.3E-8	5.0E-7	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	1.70E+0	1.0%	3.0E-7	1.40E-2	4.1E-9	8.3E-7	2.00E-2	4.1E-5
BUTYLBENZYLPHTHALATE	4.00E-1	1.0%	7.0E-8	NA	NA	2.0E-7	2.00E-1	9.8E-7
CARBAZOLE	3.33E-1	1.0%	5.8E-8	2.00E-2	1.2E-9	1.6E-7	NA	NA
CARBON-TETRACHLORIDE	6.42E-3	1.0%	1.1E-9	1.30E-1	1.5E-10	3.1E-9	7.00E-4	4.5E-6
CHLOROFORM	6.12E-3	1.0%	1.1E-9	6.10E-3	6.5E-12	3.0E-9	1.00E-2	3.0E-7
CHRYSENE	1.26E+0	1.0%	2.2E-7	7.30E-3	1.6E-9	6.1E-7	NA	NA
delta-BHC	2.47E-3	1.0%	4.3E-10	NA	NA	1.2E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.73E-1	1.0%	4.8E-8	NA	NA	1.3E-7	1.00E-1	1.3E-6
DI-N-OCTYLPHTHALATE	3.97E-1	1.0%	6.9E-8	NA	NA	1.9E-7	2.00E-2	9.7E-6
DIBENZ(a,h)ANTHRACENE	3.62E-1	1.0%	6.3E-8	7.30E+0	4.6E-7	1.8E-7	NA	NA
DIBENZOFURAN	3.52E-1	1.0%	6.2E-8	NA	NA	1.7E-7	4.00E-3	4.3E-5
DIELDRIN	1.21E-2	1.0%	2.1E-9	1.60E+1	3.4E-8	5.8E-9	5.00E-5	1.2E-4
DIETHYLPHTHALATE	3.38E-1	1.0%	5.9E-8	NA	NA	1.7E-7	8.00E-1	2.1E-7
ENDOSULFAN-II	5.94E-3	1.0%	1.0E-9	NA	NA	2.9E-9	NA	NA
ENDOSULFAN-SULFATE	3.64E-3	1.0%	6.4E-10	NA	NA	1.8E-9	NA	NA
ENDRIN	1.54E-2	1.0%	2.7E-9	NA	NA	7.6E-9	3.00E-4	2.5E-5
ETHYLBENZENE	6.51E-3	1.0%	1.1E-9	NA	NA	3.2E-9	1.00E-1	3.2E-8
FLUORANTHENE	2.11E+0	1.0%	3.7E-7	NA	NA	1.0E-6	4.00E-2	2.6E-5
FLUORENE	3.72E-1	1.0%	6.5E-8	NA	NA	1.8E-7	4.00E-2	4.5E-6
HEPTACHLOR	3.02E-3	1.0%	5.3E-10	4.50E+0	2.4E-9	1.5E-9	5.00E-4	3.0E-6
HEPTACHLOR-EPOXIDE	1.08E-2	1.0%	1.9E-9	9.10E+0	1.7E-8	5.3E-9	1.30E-5	4.1E-4
INDENO(1,2,3-cd)PYRENE	7.67E-1	1.0%	1.3E-7	7.30E-1	9.8E-8	3.8E-7	NA	NA
NAPTHALENE	4.08E-1	1.0%	7.1E-8	NA	NA	2.0E-7	4.00E-2	5.0E-6
PHENANTHRENE	1.32E+0	1.0%	2.3E-7	NA	NA	6.5E-7	NA	NA
PYRENE	1.90E+0	1.0%	3.3E-7	NA	NA	9.3E-7	3.00E-2	3.1E-5
TETRACHLOROETHENE	9.89E-3	1.0%	1.7E-9	5.20E-2	9.0E-11	4.8E-9	1.00E-2	4.8E-7
TOLUENE	1.00E-2	1.0%	1.8E-9	NA	NA	4.9E-9	2.00E-1	2.5E-8
TRICHLOROETHENE	6.24E-3	1.0%	1.1E-9	1.10E-2	1.2E-11	3.1E-9	NA	NA
XYLENE	1.14E-2	1.0%	2.0E-9	NA	NA	5.6E-9	2.00E+0	2.8E-9
2,3,7,8-TCDD (Equiv)	2.28E-4	1.0%	4.0E-11	1.50E+5	6.0E-6	1.1E-10	NA	NA
TOTAL					**1.78E-5**			**0.11**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.7E-5
Summary Intake Factor, noncancer: 4.9E-5

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption efficiency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption efficiency

Source: Ecology and Environment, Inc., 1994

Table S.B-25

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE

Current Industrial Average Scenario - Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermanlly absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	AF: adherence factor
	ABS: absorption factor
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time
CF: conversion factor	

Exposure Factors:

CS*	–	(mg/kg)
DA_{event}*	–	(mg/kg-day)
AF	0.2	(mg/cm^2-event)
ABS**	–	(unitless)
ED	9	(years)
EF	40	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

** - 0.1% for metals; 1% for organics

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	LADI (mg/kg-day)	Dermal SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Dermal RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	5.77E+3	0.1%	1.2E-6	NA	NA	9.0E-6	NA	NA
ANTIMONY	8.54E+0	0.1%	1.7E-9	NA	NA	1.3E-8	2.00E-5 (b)	6.7E-4
ARSENIC	1.70E+1	0.1%	3.4E-9	3.50E+1 (a)	1.2E-7	2.7E-8	1.50E-5 (b)	1.8E-3
BARIUM	4.28E+2	0.1%	8.6E-8	NA	NA	6.7E-7	3.50E-3 (b)	1.9E-4
BERYLLIUM	3.06E-1	0.1%	6.1E-11	8.60E+1 (a)	5.3E-9	4.8E-10	2.50E-4 (b)	1.9E-6
CADMIUM	4.01E+0	0.1%	8.1E-10	NA	NA	6.3E-9	2.50E-5 (b)	2.5E-4
COBALT	1.03E+1	0.1%	2.1E-9	NA	NA	1.6E-8	3.00E-3 (b)	5.4E-6
COPPER	3.71E+2	0.1%	7.5E-8	NA	NA	5.8E-7	1.85E-3 (b)	3.1E-4
CYANIDE	9.22E-1	0.1%	1.9E-10	NA	NA	1.4E-9	1.00E-3 (b)	1.4E-6
IRON	5.29E+4	0.1%	1.1E-5	NA	NA	8.3E-5	NA	NA
MERCURY	1.05E+0	0.1%	2.1E-10	NA	NA	1.6E-9	1.50E-5 (b)	1.1E-4
NICKEL	3.65E+1	0.1%	7.3E-9	NA	NA	5.7E-8	1.00E-3 (b)	5.7E-5
SILVER	4.00E+0	0.1%	8.0E-10	NA	NA	6.3E-9	5.00E-3	1.3E-6
THALLIUM	5.50E-1	0.1%	1.1E-10	NA	NA	8.6E-10	NA	NA
VANADIUM	1.80E+1	0.1%	3.6E-9	NA	NA	2.8E-8	7.00E-3	4.0E-6
1,1,1-TRICHLOROETHANE	6.47E-3	1.0%	1.3E-11	NA	NA	1.0E-10	NA	NA
1,1-DICHLOROETHENE	6.47E-3	1.0%	1.3E-11	6.00E-1	7.8E-12	1.0E-10	9.00E-3	1.1E-8
1,2-DICHLOROETHENE (total)	6.41E-3	1.0%	1.3E-11	NA	NA	1.0E-10	9.00E-3	1.1E-8
1,4-DICHLOROBENZENE	3.24E-1	1.0%	6.5E-10	2.40E-2	1.6E-11	5.1E-9	NA	NA
2-BUTANONE	1.00E-2	1.0%	2.0E-11	NA	NA	1.6E-10	NA	NA
2-METHYLNAPHTHALENE	3.57E-1	1.0%	7.2E-10	NA	NA	5.6E-9	NA	NA
4,4'-DDT	3.39E-2	1.0%	6.8E-11	3.40E-1	2.3E-11	5.3E-10	5.00E-4	1.1E-6
ACENAPHTHENE	3.72E-1	1.0%	7.5E-10	NA	NA	5.8E-9	6.00E-2	9.7E-8
ACENAPHTHYLENE	3.04E-1	1.0%	6.1E-10	NA	NA	4.8E-9	NA	NA
ACETONE	2.93E-2	1.0%	5.9E-11	NA	NA	4.6E-10	1.00E-1	4.6E-9
alpha-BHC	1.44E-3	1.0%	2.9E-12	NA	NA	2.3E-11	NA	NA
BENZO(b)FLUORANTHENE	1.51E+0	1.0%	3.0E-9	7.30E-1	2.2E-9	2.4E-8	NA	NA
BENZO(g,h,i)PERYLENE	8.61E-1	1.0%	1.7E-9	NA	NA	1.3E-8	NA	NA
BENZO(k)FLUORANTHENE	1.03E+0	1.0%	2.1E-9	7.30E-2	1.5E-10	1.6E-8	NA	NA
bis(2-ETHYLHEXYL)PHTHALA	1.70E+0	1.0%	3.4E-9	1.40E-2	4.8E-11	2.7E-8	2.00E-2	1.3E-6
BUTYLBENZYLPHTHALATE	4.00E-1	1.0%	8.1E-10	NA	NA	6.3E-9	2.00E-1	3.1E-8
CARBAZOLE	3.33E-1	1.0%	6.7E-10	2.00E-2	1.3E-11	5.2E-9	NA	NA
CARBON-TETRACHLORIDE	6.42E-3	1.0%	1.3E-11	1.30E-1	1.7E-12	1.0E-10	7.00E-4	1.4E-7
CHLOROFORM	6.12E-3	1.0%	1.2E-11	6.10E-3	7.5E-14	9.6E-11	1.00E-2	9.6E-9
CHRYSENE	1.26E+0	1.0%	2.5E-9	7.30E-3	1.8E-11	2.0E-8	NA	NA
delta-BHC	2.47E-3	1.0%	5.0E-12	NA	NA	3.9E-11	NA	NA
DI-N-BUTYLPHTHALATE	2.73E-1	1.0%	5.5E-10	NA	NA	4.3E-9	1.00E-1	4.3E-8
DI-N-OCTYLPHTHALATE	3.97E-1	1.0%	8.0E-10	NA	NA	6.2E-9	2.00E-2	3.1E-7
DIBENZ(a,h)ANTHRACENE	3.62E-1	1.0%	7.3E-10	7.30E+0	5.3E-9	5.7E-9	NA	NA
DIBENZOFURAN	3.52E-1	1.0%	7.1E-10	NA	NA	5.5E-9	4.00E-3	1.4E-6
DIELDRIN	1.21E-2	1.0%	2.4E-11	1.60E+1	3.9E-10	1.9E-10	5.00E-5	3.8E-6
DIETHYLPHTHALATE	3.38E-1	1.0%	6.8E-10	NA	NA	5.3E-9	8.00E-1	6.6E-9
ENDOSULFAN-II	5.94E-3	1.0%	1.2E-11	NA	NA	9.3E-11	NA	NA
ENDOSULFAN-SULFATE	3.64E-3	1.0%	7.3E-12	NA	NA	5.7E-11	NA	NA
ENDRIN	1.54E-2	1.0%	3.1E-11	NA	NA	2.4E-10	3.00E-4	8.1E-7
ETHYLBENZENE	6.51E-3	1.0%	1.3E-11	NA	NA	1.0E-10	1.00E-1	1.0E-9
FLUORANTHENE	2.11E+0	1.0%	4.3E-9	NA	NA	3.3E-8	4.00E-2	8.3E-7
FLUORENE	3.72E-1	1.0%	7.5E-10	NA	NA	5.8E-9	4.00E-2	1.5E-7
HEPTACHLOR	3.02E-3	1.0%	6.1E-12	4.50E+0	2.7E-11	4.7E-11	5.00E-4	9.5E-8
HEPTACHLOR-EPOXIDE	1.08E-2	1.0%	2.2E-11	9.10E+0	2.0E-10	1.7E-10	1.30E-5	1.3E-5
INDENO(1,2,3-cd)PYRENE	7.67E-1	1.0%	1.5E-9	7.30E-1	1.1E-9	1.2E-8	NA	NA
NAPTHALENE	4.08E-1	1.0%	8.2E-10	NA	NA	6.4E-9	4.00E-2	1.6E-7
PHENANTHRENE	1.32E+0	1.0%	2.7E-9	NA	NA	2.1E-8	NA	NA
PYRENE	1.90E+0	1.0%	3.8E-9	NA	NA	3.0E-8	3.00E-2	9.9E-7
TETRACHLOROETHENE	9.89E-3	1.0%	2.0E-11	5.20E-2	1.0E-12	1.5E-10	1.00E-2	1.5E-8
TOLUENE	1.00E-2	1.0%	2.0E-11	NA	NA	1.6E-10	2.00E-1	7.9E-10
TRICHLOROETHENE	6.24E-3	1.0%	1.3E-11	1.10E-2	1.4E-13	9.8E-11	NA	NA
XYLENE	1.14E-2	1.0%	2.3E-11	NA	NA	1.8E-10	2.00E+0	8.9E-11
2,3,7,8-TCDD (Equiv)	2.28E-4	1.0%	4.6E-13	1.50E+5	6.9E-8	3.6E-12	NA	NA
TOTAL					**2.05E-7**			**0.003**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.0E-7
Summary Intake Factor, noncancer: 1.6E-6

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Source: Ecology and Environment, Inc., 1994

Table S.B-26
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current RME Industrial Scenario - Inhalation of Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,
CS: chemical conc. in air
IR: inhalation rate
EF: exposure frequency
AT: averaging time
ED: exposure duration
BW: body weight

Exposure Factors:

CS*	--	(mg/kg)
IR	20	(m^3/day)
ED	25	(years)
EF	250	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	9,125	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day	Hazard Quotient
1,1,1-TRICHLOROETHANE	2.13E-3	1.5E-4	NA	NA	4.2E-4	NA	NA
1,2,4-TRIMETHYLBENZEN	5.96E-3	4.2E-4	NA	NA	1.2E-3	NA	NA
1,4-DICHLOROBENZENE	8.18E-3	5.7E-4	NA	NA	1.6E-3	2.28E-1	7.0E-3
BENZENE	1.28E-2	8.9E-4	2.90E-2	2.6E-5	2.5E-3	NA	NA
CHLOROFORM	2.12E-2	1.5E-3	8.00E-2	1.2E-4	4.1E-3	NA	NA
CHLOROMETHANE	9.53E-4	6.7E-5	6.30E-3	4.2E-7	1.9E-4	NA	NA
ETHYLBENZENE	2.01E-2	1.4E-3	NA	NA	3.9E-3	2.85E-1	1.4E-2
FREON 11	1.05E-2	7.3E-4	NA	NA	2.1E-3	NA	NA
FREON 12	4.45E-3	3.1E-4	NA	NA	8.7E-4	NA	NA
M,P-XYLENE	1.12E-2	7.9E-4	NA	NA	2.2E-3	NA	NA
O-XYLENE	3.92E-3	2.7E-4	NA	NA	7.7E-4	NA	NA
TOLUENE	6.99E-3	4.9E-4	NA	NA	1.4E-3	1.10E-1	1.2E-2
TRICHLOROETHENE	3.89E-3	2.7E-4	6.00E-3	1.6E-6	7.6E-4	NA	NA
TOTAL				1.46E-4			3.33E-2

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 7.0E-2
Summary Intake Factor, noncancer: 2.0E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-27

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE

Current Average Industrial Scenario - Inhalation of Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CS: chemical conc. in air ED: exposure duration
IR: inhalation rate BW: body weight
EF: exposure frequency
AT: averaging time

Exposure Facto

CS*	–	(mg/kg)
IR	20	(m^3/day)
ED	9	(years)
EF	250	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,1,1-TRICHLOROETHANE	2.1E-3	5.4E-5	NA	NA	4.2E-4	NA	NA
1,2,4-TRIMETHYLBENZEN	6.0E-3	1.5E-4	NA	NA	1.2E-3	NA	NA
1,4-DICHLOROBENZENE	8.2E-3	2.1E-4	NA	NA	1.6E-3	2.28E-1	7.0E-3
BENZENE	1.3E-2	3.2E-4	2.90E-2	9.3E-6	2.5E-3	NA	NA
CHLOROFORM	2.1E-2	5.3E-4	8.00E-2	4.3E-5	4.1E-3	NA	NA
CHLOROMETHANE	9.5E-4	2.4E-5	6.30E-3	1.5E-7	1.9E-4	NA	NA
ETHYLBENZENE	2.0E-2	5.1E-4	NA	NA	3.9E-3	2.85E-1	1.4E-2
FREON 11	1.1E-2	2.6E-4	NA	NA	2.1E-3	NA	NA
FREON 12	4.5E-3	1.1E-4	NA	NA	8.7E-4	NA	NA
M,P-XYLENE	1.1E-2	2.8E-4	NA	NA	2.2E-3	NA	NA
O-XYLENE	3.9E-3	9.9E-5	NA	NA	7.7E-4	NA	NA
TOLUENE	7.0E-3	1.8E-4	NA	NA	1.4E-3	1.10E-1	1.2E-2
TRICHLOROETHENE	3.9E-3	9.8E-5	6.00E-3	5.9E-7	7.6E-4	NA	NA
TOTAL				5.27E-5			0.033

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.5E-2
Summary Intake Factor, noncancer: 2.0E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-28
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current RME Trespasser Scenario - Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times ED \times EF \times FI}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
IR	100	(mg/day)
ED	10	(years)
EF	180	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,650	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	9.78E+3	9.8E-4	NA	NA	6.9E-3	NA	NA
Antimony	1.94E+1	2.0E-6	NA	NA	1.4E-5	4.00E-4	3.42E-2
Arsenic	3.53E+1	3.6E-6	1.75E+0	6.2E-6	2.5E-5	3.00E-4	8.29E-2
Barium	9.00E+2	9.1E-5	NA	NA	6.3E-4	7.00E-2	9.06E-3
Beryllium	3.54E-1	3.6E-8	4.30E+0	1.5E-7	2.5E-7	5.00E-3	4.98E-5
Cadmium	1.46E+1	1.5E-6	NA	NA	1.0E-5	5.00E-4	2.06E-2
Cobalt	1.56E+1	1.6E-6	NA	NA	1.1E-5	6.00E-2	1.83E-4
Copper	1.37E+3	1.4E-4	NA	NA	9.6E-4	3.70E-2	2.60E-2
Cyanide	1.76E+0	1.8E-7	NA	NA	1.2E-6	2.00E-2	6.21E-5
Iron	1.47E+5	1.5E-2	NA	NA	1.0E-1	NA	NA
Mercury	1.85E+0	1.9E-7	NA	NA	1.3E-6	3.00E-4	4.34E-3
Nickel	7.63E+1	7.7E-6	NA	NA	5.4E-5	2.00E-2	2.69E-3
Silver	1.16E+1	1.2E-6	NA	NA	8.2E-6	5.00E-3	1.63E-3
Thallium	5.76E-1	5.8E-8	NA	NA	4.1E-7	NA	NA
Vanadium	2.82E+1	2.8E-6	NA	NA	2.0E-5	7.00E-3	2.84E-3
1,1,1-TRICHLOROETHANE	6.06E-3	6.1E-10	NA	NA	4.3E-9	NA	NA
1,1-DICHLOROETHENE	6.54E-3	6.6E-10	6.00E-1	4.0E-10	4.6E-9	9.00E-3	5.12E-7
1,2-DICHLOROETHENE (total	6.48E-3	6.5E-10	NA	NA	4.6E-9	9.00E-3	5.07E-7
4,4'-DDE	2.56E-1	2.6E-8	3.40E-1	8.7E-9	1.8E-7	NA	NA
4,4'-DDT	2.29E-1	2.3E-8	3.40E-1	7.8E-9	1.6E-7	5.00E-4	3.22E-4
ACENAPHTHENE	2.86E-1	2.9E-8	NA	NA	2.0E-7	6.00E-2	3.36E-6
ACENAPHTHYLENE	2.50E-1	2.5E-8	NA	NA	1.8E-7	NA	NA
ACETONE	8.32E-3	8.4E-10	NA	NA	5.9E-9	1.00E-1	5.86E-8
ALDRIN	3.64E-3	3.7E-10	1.70E+1	6.2E-9	2.6E-9	3.00E-5	8.55E-5
ALPHA-CHLORDANE	3.51E-2	3.5E-9	NA	NA	2.5E-8	NA	NA
ANTHRACENE	4.39E-1	4.4E-8	NA	NA	3.1E-7	3.00E-1	1.03E-6
AROCLOR-1254	1.19E-1	1.2E-8	NA	NA	8.4E-8	NA	NA
AROCLOR-1260	9.46E-2	9.5E-9	NA	NA	6.7E-8	NA	NA
BENZO(a)ANTHRACENE	2.78E+0	2.8E-7	7.30E-1 (*)	2.0E-7	2.0E-6	NA	NA
BENZO(a)PYRENE	2.36E+0	2.4E-7	7.30E+0	1.7E-6	1.7E-6	NA	NA
BENZO(b)FLUORANTHENE	2.63E+0	2.6E-7	7.30E-1 (*)	1.9E-7	1.8E-6	NA	NA
BENZO(g,h,i)PERYLENE	1.58E+0	1.6E-7	NA	NA	1.1E-6	NA	NA
BENZO(k)FLUORANTHENE	1.83E+0	1.8E-7	7.30E-2 (*)	1.3E-8	1.3E-6	NA	NA
bis(2-ETHYLHEXYL)PHTHAL	4.26E-1	4.3E-8	1.40E-2	6.0E-10	3.0E-7	2.00E-2	1.50E-5
BUTYLBENZYLPHTHALATE	3.08E-1	3.1E-8	NA	NA	2.2E-7	2.00E-1	1.08E-6
CARBAZOLE	2.46E-1	2.5E-8	2.00E-2	5.0E-10	1.7E-7	NA	NA
CHRYSENE	2.55E+0	2.6E-7	7.30E-3 (*)	1.9E-9	1.8E-6	NA	NA
delta-BHC	2.29E-3	2.3E-10	NA	NA	1.6E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.96E-1	3.0E-8	NA	NA	2.1E-7	1.00E-1	2.08E-6
DI-N-OCTYLPHTHALATE	2.60E-1	2.6E-8	NA	NA	1.8E-7	2.00E-2	9.15E-6
DIBENZ(a,h)ANTHRACENE	3.48E-1	3.5E-8	7.30E+0 (*)	2.6E-7	2.5E-7	NA	NA
DIBENZOFURAN	2.65E-1	2.7E-8	NA	NA	1.9E-7	4.00E-3	4.67E-5
DIELDRIN	1.89E-2	1.9E-9	1.60E+1	3.0E-8	1.3E-8	5.00E-5	2.66E-4
DIETHYLPHTHALATE	2.60E-1	2.6E-8	NA	NA	1.8E-7	8.00E-1	2.29E-7
ENDOSULFAN-II	1.61E-2	1.6E-9	NA	NA	1.1E-8	NA	NA
ENDOSULFAN-SULFATE	6.45E-3	6.5E-10	NA	NA	4.5E-9	NA	NA
ENDRIN	2.89E-2	2.9E-9	NA	NA	2.0E-8	3.00E-4	6.78E-5
ENDRIN-ALDEHYDE	6.75E-2	6.8E-9	NA	NA	4.8E-8	NA	NA
ENDRIN-KETONE	7.15E-3	7.2E-10	NA	NA	5.0E-9	NA	NA
FLUORANTHENE	4.10E+0	4.1E-7	NA	NA	2.9E-6	4.00E-2	7.21E-5
FLUORENE	2.62E-1	2.6E-8	NA	NA	1.8E-7	4.00E-2	4.61E-6
GAMMA-CHLORDANE	3.06E-2	3.1E-9	NA	NA	2.2E-8	NA	NA
HEPTACHLOR	4.15E-3	4.2E-10	4.50E+0	1.9E-9	2.9E-9	5.00E-4	5.85E-6
HEPTACHLOR-EPOXIDE	5.52E-3	5.6E-10	9.10E+0	5.1E-9	3.9E-9	1.30E-5	2.99E-4
INDENO(1,2,3-cd)PYRENE	1.36E+0	1.4E-7	7.30E-1	1.0E-7	9.6E-7	NA	NA
METHOXYCHLOR	4.27E-2	4.3E-9	NA	NA	3.0E-8	5.00E-3	6.01E-6
METHYLENE-CHLORIDE	1.32E-2	1.3E-9	7.50E-3	1.0E-11	9.3E-9	6.00E-2	1.56E-7
NAPTHALENE	2.38E-1	2.4E-8	NA	NA	1.7E-7	4.00E-2	4.19E-6
PHENANTHRENE	1.45E+0	1.5E-7	NA	NA	1.0E-6	NA	NA
PYRENE	3.94E+0	4.0E-7	NA	NA	2.8E-6	3.00E-2	9.26E-5
TETRACHLOROETHENE	6.51E-3	6.6E-10	5.20E-2	3.4E-11	4.6E-9	1.00E-2	4.59E-7
TOLUENE	7.28E-3	7.3E-10	NA	NA	5.1E-9	2.00E-1	2.56E-8
XYLENE	6.37E-3	6.4E-10	NA	NA	4.5E-9	2.00E+0	2.24E-9
2,3,7,8-TCDD (Equiv)	3.09E-4	3.1E-11	1.50E+5	4.7E-6	2.2E-10	NA	NA
TOTAL				1.36E-5			0.19

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.0E-7
Summary Intake Factor, noncancer: 7.0E-7

Ecology and Environment, Inc., 1994

Table S.B-29

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE

Current Trespasser RME Scenario - Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	AF: adherence factor
	ABS: absorption factor
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time
CS: chemical conc. in soil	CF: conversion factor

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	--	(unitless)
ED	10	(years)
EF	180	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,650	(days) noncancer

* - Chemical specific value

** - 0.1% for metals; 1% for organics

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	LADI (mg/kg-day)	Dermal SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Dermal RfD (mg/kg-day)	Hazard Quotient
Aluminum	9.78E+3	0.1%	4.9E-5	NA	NA	3.4E-4	NA	NA
Antimony	1.94E+1	0.1%	9.8E-8	NA	NA	6.8E-7	2.00E-5 (b)	3.4E-2
Arsenic	3.53E+1	0.1%	1.8E-7	3.50E+1 (a)	6.2E-6	1.2E-6	1.50E-5 (b)	8.3E-2
Barium	9.00E+2	0.1%	4.5E-6	NA	NA	3.2E-5	3.50E-3 (b)	9.1E-3
Beryllium	3.54E-1	0.1%	1.8E-9	8.60E+1 (a)	1.5E-7	1.2E-8	2.50E-4 (b)	5.0E-5
Cadmium	1.46E+1	0.1%	7.4E-8	NA	NA	5.2E-7	2.50E-5 (b)	2.1E-2
Cobalt	1.56E+1	0.1%	7.9E-8	NA	NA	5.5E-7	NA	NA
Cyanide	1.76E+0	0.1%	8.9E-9	NA	NA	6.2E-8	1.00E-3 (b)	6.2E-5
Iron	1.47E+5	0.1%	7.4E-4	NA	NA	5.2E-3	NA	NA
Mercury	1.85E+0	0.1%	9.3E-9	NA	NA	6.5E-8	1.50E-5 (b)	4.3E-3
Nickel	7.63E+1	0.1%	3.8E-7	NA	NA	2.7E-6	1.00E-3 (b)	2.7E-3
Silver	1.16E+1	0.1%	5.8E-8	NA	NA	4.1E-7	2.50E-4 (b)	1.6E-3
Thallium	5.76E-1	0.1%	2.9E-9	NA	NA	2.0E-8	NA	NA
Vanadium	2.82E+1	0.1%	1.4E-7	NA	NA	9.9E-7	3.50E-4	2.8E-3
1,1,1-TRICHLOROETHANE	6.06E-3	1.0%	3.1E-10	NA	NA	2.1E-9	NA	NA
1,1-DICHLOROETHENE	6.54E-3	1.0%	3.3E-10	6.00E-1	2.0E-10	2.3E-9	9.00E-3	2.6E-7
1,2-DICHLOROETHENE (total)	6.48E-3	1.0%	3.3E-10	NA	NA	2.3E-9	9.00E-3	2.5E-7
4,4'-DDE	2.56E-1	1.0%	1.3E-8	3.40E-1	4.4E-9	9.0E-8	NA	NA
4,4'-DDT	2.29E-1	1.0%	1.2E-8	3.40E-1	3.9E-9	8.1E-8	5.00E-4	1.6E-4
ACENAPHTHENE	2.86E-1	1.0%	1.4E-8	NA	NA	1.0E-7	na	NA
ACENAPHTHYLENE	2.50E-1	1.0%	1.3E-8	NA	NA	8.8E-8	NA	NA
ACETONE	8.32E-3	1.0%	4.2E-10	NA	NA	2.9E-9	1.00E-1	2.9E-8
ALDRIN	3.64E-3	1.0%	1.8E-10	1.70E+1	3.1E-9	1.3E-9	3.00E-5	4.3E-5
ALPHA-CHLORDANE	3.51E-2	1.0%	1.8E-9	NA	NA	1.2E-8	NA	NA
ANTHRACENE	4.39E-1	1.0%	2.2E-8	NA	NA	1.5E-7	3.00E-1	5.2E-7
AROCLOR-1254	1.19E-1	1.0%	6.0E-9	NA	NA	4.2E-8	NA	NA
AROCLOR-1260	9.46E-2	1.0%	4.8E-9	NA	NA	3.3E-8	NA	NA
BENZO(a)ANTHRACENE	2.78E+0	1.0%	1.4E-7	NA	NA	9.8E-7	NA	NA
BENZO(a)PYRENE	2.38E+0	1.0%	1.2E-7	NA	NA	8.3E-7	NA	NA
BENZO(b)FLUORANTHENE	2.63E+0	1.0%	1.3E-7	na	NA	9.2E-7	NA	NA
BENZO(g,h,i)PERYLENE	1.58E+0	1.0%	7.9E-8	na	NA	5.6E-7	NA	NA
BENZO(k)FLUORANTHENE	1.83E+0	1.0%	9.2E-8	na	NA	6.4E-7	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	4.26E-1	1.0%	2.1E-8	1.40E-2	3.0E-10	1.5E-7	2.00E-2	7.5E-6
BUTYLBENZYLPHTHALATE	3.08E-1	1.0%	1.5E-8	NA	NA	1.1E-7	2.00E-1	5.4E-7
CARBAZOLE	2.46E-1	1.0%	1.2E-8	NA	NA	8.7E-8	NA	NA
CHRYSENE	2.55E+0	1.0%	1.3E-7	7.30E-3	9.4E-10	9.0E-7	NA	NA
delta-BHC	2.29E-3	1.0%	1.2E-10	NA	NA	8.1E-10	NA	NA
DI-N-BUTYLPHTHALATE	2.96E-1	1.0%	1.5E-8	NA	NA	1.0E-7	1.00E-1	1.0E-6
DI-N-OCTYLPHTHALATE	2.60E-1	1.0%	1.3E-8	NA	NA	9.1E-8	2.00E-2	4.6E-6
DIBENZ(a,h)ANTHRACENE	3.48E-1	1.0%	1.8E-8	na	NA	1.2E-7	NA	NA
DIBENZOFURAN	2.65E-1	1.0%	1.3E-8	NA	NA	9.3E-8	4.00E-3	2.3E-5
DIELDRIN	1.89E-2	1.0%	9.5E-10	1.60E+1	1.5E-8	6.6E-9	5.00E-5	1.3E-4
DIETHYLPHTHALATE	2.60E-1	1.0%	1.3E-8	NA	NA	9.2E-8	8.00E-1	1.1E-7
ENDOSULFAN-II	1.61E-2	1.0%	8.1E-10	NA	NA	5.7E-9	NA	NA
ENDOSULFAN-SULFATE	6.45E-3	1.0%	3.2E-10	NA	NA	2.3E-9	NA	NA
ENDRIN	2.89E-2	1.0%	1.5E-9	NA	NA	1.0E-8	3.00E-4	3.4E-5
ENDRIN-ALDEHYDE	6.75E-2	1.0%	3.4E-9	NA	NA	2.4E-8	NA	NA
ENDRIN-KETONE	7.15E-3	1.0%	3.6E-10	NA	NA	2.5E-9	NA	NA
FLUORANTHENE	4.10E+0	1.0%	2.1E-7	NA	NA	1.4E-6	na	NA
FLUORENE	2.62E-1	1.0%	1.3E-8	NA	NA	9.2E-8	na	NA
GAMMA-CHLORDANE	3.06E-2	1.0%	1.5E-9	NA	NA	1.1E-8	NA	NA
HEPTACHLOR	4.15E-3	1.0%	2.1E-10	4.50E+0	9.4E-10	1.5E-9	5.00E-4	2.9E-6
HEPTACHLOR-EPOXIDE	5.52E-3	1.0%	2.8E-10	9.10E+0	2.5E-9	1.9E-9	1.30E-5	1.5E-4
INDENO(1,2,3-cd)PYRENE	1.38E+0	1.0%	6.8E-8	na	NA	4.8E-7	NA	NA
METHOXYCHLOR	4.27E-2	1.0%	2.1E-9	NA	NA	1.5E-8	5.00E-3	3.0E-6
METHYLENE-CHLORIDE	1.32E-2	1.0%	6.7E-10	7.50E-3	5.0E-12	4.7E-9	6.00E-2	7.8E-8
NAPTHALENE	2.38E-1	1.0%	1.2E-8	NA	NA	8.4E-8	4.00E-2	2.1E-6
PHENANTHRENE	1.45E+0	1.0%	7.3E-8	NA	NA	5.1E-7	NA	NA
PYRENE	3.94E+0	1.0%	2.0E-7	NA	NA	1.4E-6	na	NA
TETRACHLOROETHENE	6.51E-3	1.0%	3.3E-10	5.20E-2	1.7E-11	2.3E-9	1.00E-2	2.3E-7
TOLUENE	7.28E-3	1.0%	3.7E-10	NA	NA	2.6E-9	2.00E-1	1.3E-8
XYLENE	6.37E-3	1.0%	3.2E-10	NA	NA	2.2E-9	2.00E+0	1.1E-9
2,3,7,8-TCDD (Equiv)	3.09E-4	1.0%	1.6E-11	1.50E+5	2.3E-6	1.1E-10	NA	NA
TOTAL					**8.73E-6**			**0.185**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer:	5.0E-6
Summary Intake Factor, noncancer:	3.5E-5

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Source: Ecology and Environment, Inc., 1994

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Table S.B-30
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Current RME Trespasser Scenario - Inhalation of Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CS: chemical conc. in air	ED: exposure duration
IR: inhalation rate	BW: body weight
EF: exposure frequency	AT: averaging time
FI: fraction inhaled from contaminated source	

Exposure Factors:

CS*	–	(mg/kg)
IR	20	(m^3/day)
ED	10	(years)
EF	180	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,650	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,2,4-TRIMETHYLBENZENE	1.4E-3	2.8E-5	NA	NA	1.9E-4	NA	NA
BENZENE	4.3E-3	8.6E-5	2.90E-2	2.5E-6	6.0E-4	NA	NA
CHLOROMETHANE	8.9E-4	1.8E-5	6.30E-3	1.1E-7	1.3E-4	NA	NA
ETHYLBENZENE	9.8E-4	2.0E-5	NA	NA	1.4E-4	2.85E-1	4.8E-4
FREON 11	1.9E-3	3.9E-5	NA	NA	2.7E-4	NA	NA
FREON 12	2.8E-3	5.6E-5	NA	NA	4.0E-4	NA	NA
M,P-XYLENE	3.0E-3	6.1E-5	NA	NA	4.3E-4	NA	NA
O-XYLENE	1.1E-3	2.2E-5	NA	NA	1.5E-4	NA	NA
TOLUENE	4.9E-3	9.9E-5	NA	NA	6.9E-4	1.10E-1	6.3E-3
TOTAL				**2.61E-6**			**0.01**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.0E-2
Summary Intake Factor, noncancer: 1.4E-1

Source: Ecology and Environment, Inc., 1994

Table S.B-31
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times FI \times ED \times EF}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	–	(mg/kg)
IR	200	(mg/day)
ED	6	(years)
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Subchronic Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	1.1E-2	NA	NA	1.3E-1	NA	NA
Antimony	2.10E+1	2.2E-5	NA	NA	2.5E-4	4.00E-4	6.28E-1
Arsenic	3.75E+1	3.9E-5	1.75E+0	6.7E-5	4.5E-4	3.00E-4	1.50E+0
Barium	9.37E+2	9.6E-4	NA	NA	1.1E-2	7.00E-2	1.60E-1
Beryllium	4.18E-1	4.3E-7	4.30E+0	1.8E-6	5.0E-6	5.00E-3	1.00E-3
Cadmium	1.41E+1	1.4E-5	NA	NA	1.7E-4	5.00E-4	3.37E-1
Cobalt	1.75E+1	1.8E-5	NA	NA	2.1E-4	NA	NA
Copper	2.04E+3	2.1E-3	NA	NA	2.4E-2	3.70E-2	6.62E-1
Cyanide	1.75E+0	1.8E-6	NA	NA	2.1E-5	2.00E-2	1.05E-3
Iron	1.54E+5	1.6E-1	NA	NA	1.8E+0	NA	NA
Mercury	1.96E+0	2.0E-6	NA	NA	2.4E-5	3.00E-4	7.84E-2
Nickel	7.82E+1	8.0E-5	NA	NA	9.4E-4	2.00E-2	4.68E-2
Silver	1.46E+1	1.5E-5	NA	NA	1.8E-4	5.00E-3	3.51E-2
Thallium	1.02E+0	1.0E-6	NA	NA	1.2E-5	NA	NA
Vanadium	3.02E+1	3.1E-5	NA	NA	3.6E-4	7.00E-3	5.17E-2
1,1,1-TRICHLOROETHANE	6.21E-3	6.4E-9	NA	NA	7.4E-8	NA	NA
1,1-DICHLOROETHENE	6.50E-3	6.7E-9	6.00E-1	4.0E-9	7.8E-8	9.00E-3	8.65E-6
2-METHYLNAPHTHALENE	2.15E-1	2.2E-7	NA	NA	2.6E-6	NA	NA
4,4'-DDD	7.03E-2	7.2E-8	2.40E-1	1.7E-8	8.4E-7	NA	NA
4,4'-DDE	1.50E-1	1.5E-7	3.40E-1	5.2E-8	1.8E-6	NA	NA
4,4'-DDT	2.25E-1	2.3E-7	3.40E-1	7.9E-8	2.7E-6	5.00E-4	5.40E-3
ACENAPHTHENE	2.42E-1	2.5E-7	NA	NA	2.9E-6	6.00E-1	4.84E-6
ACENAPHTHYLENE	2.27E-1	2.3E-7	NA	NA	2.7E-6	NA	NA
ACETONE	1.12E-2	1.1E-8	NA	NA	1.3E-7	1.00E+0	1.34E-7
ALDRIN	3.42E-3	3.5E-9	1.70E+1	6.0E-8	4.1E-8	3.00E-5	1.37E-3
ALPHA-CHLORDANE	4.11E-2	4.2E-8	NA	NA	4.9E-7	NA	NA
ANTHRACENE	3.37E-1	3.5E-7	NA	NA	4.0E-6	3.00E+0	1.35E-6
AROCLOR-1254	9.91E-2	1.0E-7	NA	NA	1.2E-6	NA	NA
AROCLOR-1260	1.11E-1	1.1E-7	NA	NA	1.3E-6	NA	NA
BENZO(a)ANTHRACENE	1.82E+0	1.9E-6	7.30E-1 (*)	1.4E-6	2.2E-5	NA	NA
BENZO(a)PYRENE	1.56E+0	1.6E-6	7.30E+0	1.2E-5	1.9E-5	NA	NA
BENZO(b)FLUORANTHENE	2.07E+0	2.1E-6	7.30E-1 (*)	1.6E-6	2.5E-5	NA	NA
BENZO(g,h,i)PERYLENE	1.13E+0	1.2E-6	NA	NA	1.4E-5	NA	NA
BENZO(k)FLUORANTHENE	1.19E+0	1.2E-6	7.30E-2 (*)	8.9E-8	1.4E-5	NA	NA
beta-BHC	2.61E-3	2.7E-9	NA	NA	3.1E-8	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	3.93E-1	4.0E-7	1.40E-2	5.7E-9	4.7E-6	2.00E-2	2.35E-4
BUTYLBENZYLPHTHALATE	2.76E-1	2.8E-7	NA	NA	3.3E-6	2.00E+0	1.66E-6
CARBAZOLE	2.40E-1	2.5E-7	2.00E-2	4.9E-9	2.9E-6	NA	NA
CHRYSENE	1.99E+0	2.0E-6	7.30E-3 (*)	1.5E-8	2.4E-5	NA	NA
delta-BHC	2.21E-3	2.3E-9	NA	NA	2.6E-8	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	2.6E-7	NA	NA	3.1E-6	1.00E+0	3.06E-6
DI-N-OCTYLPHTHALATE	2.50E-1	2.6E-7	NA	NA	3.0E-6	2.00E-2	1.50E-4
DIBENZ(a,h)ANTHRACENE	3.13E-1	3.2E-7	7.30E+0 (*)	2.3E-6	3.7E-6	NA	NA
DIBENZOFURAN	2.36E-1	2.4E-7	NA	NA	2.8E-6	NA	NA
DIELDRIN	1.90E-2	2.0E-8	1.60E+1	3.1E-7	2.3E-7	5.00E-5	4.56E-3
DIETHYLPHTHALATE	2.43E-1	2.5E-7	NA	NA	2.9E-6	8.00E+0	3.65E-7
ENDOSULFAN-II	1.19E-2	1.2E-8	NA	NA	1.4E-7	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	5.7E-9	NA	NA	6.6E-8	NA	NA
ENDRIN	1.88E-2	1.9E-8	NA	NA	2.3E-7	3.00E-4	7.52E-4
ENDRIN ALDEHYDE	3.14E-2	3.2E-8	NA	NA	3.8E-7	NA	NA
ENDRIN KETONE	8.37E-3	8.6E-9	NA	NA	1.0E-7	NA	NA
FLUORANTHENE	2.87E+0	3.0E-6	NA	NA	3.4E-5	4.00E-1	8.61E-5
FLUORENE	2.42E-1	2.5E-7	NA	NA	2.9E-6	4.00E-1	7.24E-6
gama-BHC	2.11E-3	2.2E-9	NA	NA	2.5E-8	NA	NA
GAMMA-CHLORDANE	3.11E-2	3.2E-8	NA	NA	3.7E-7	NA	NA
HEPTACHLOR	2.89E-3	3.0E-9	4.50E+0	1.3E-8	3.5E-8	5.00E-4	6.92E-5
HEPTACHLOR EPOXIDE	4.45E-3	4.6E-9	9.10E+0	4.2E-8	5.3E-8	1.30E-5	4.11E-3
INDENO(1,2,3-cd)PYRENE	9.35E-1	9.6E-7	7.30E-1 (*)	7.0E-7	1.1E-5	NA	NA
METHOXYCHLOR	2.95E-2	3.0E-8	NA	NA	3.5E-7	5.00E-3	7.06E-5
METHYLENE CHLORIDE	1.29E-2	1.3E-8	7.50E-3	9.9E-11	1.5E-7	6.00E-2	2.57E-6
NAPTHALENE	2.13E-1	2.2E-7	NA	NA	2.6E-6	NA	NA
PHENANTHRENE	1.18E+0	1.2E-6	NA	NA	1.4E-5	NA	NA
PYRENE	2.80E+0	2.9E-6	NA	NA	3.4E-5	3.00E-1	1.12E-4
TETRACHLOROETHENE	6.85E-3	7.0E-9	5.20E-2	3.7E-10	8.2E-8	1.00E-1	8.21E-7
TOLUENE	8.03E-3	8.3E-9	NA	NA	9.6E-8	2.00E+0	4.81E-8
XYLENE	6.81E-3	7.0E-9	NA	NA	8.2E-8	2.00E+0	4.08E-8
2,3,7,8-TCDD (Equiv)	2.48E-4	2.5E-10	1.50E+5	3.8E-5	3.0E-9	NA	NA
TOTAL				**1.26E-4**			**3.5**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.0E-6
Summary Intake Factor, noncancer: 1.2E-5

Source: Ecology and Environment, Inc. 1994

Table S.B-32
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times FI \times ED \times EF}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
IR	100	(mg/day)
ED	24	(years)
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	5.2E-3	NA	NA	1.5E-2	NA	NA
Antimony	2.10E+1	9.8E-6	NA	NA	2.9E-5	4.00E-4	7.18E-2
Arsenic	3.75E+1	1.8E-5	1.75E+0	3.1E-5	5.1E-5	3.00E-4	1.71E-1
Barium	9.37E+2	4.4E-4	NA	NA	1.3E-3	7.00E-2	1.83E-2
Beryllium	4.18E-1	2.0E-7	4.30E+0	8.4E-7	5.7E-7	5.00E-3	1.15E-4
Cadmium	1.41E+1	6.6E-6	NA	NA	1.9E-5	5.00E-4	3.86E-2
Cobalt	1.75E+1	8.2E-6	NA	NA	2.4E-5	6.00E-2	4.00E-4
Copper	2.04E+3	9.6E-4	NA	NA	2.8E-3	3.70E-2	7.56E-2
Cyanide	1.75E+0	8.2E-7	NA	NA	2.4E-6	2.00E-2	1.20E-4
Iron	1.54E+5	7.2E-2	NA	NA	2.1E-1	NA	NA
Mercury	1.96E+0	9.2E-7	NA	NA	2.7E-6	3.00E-4	8.96E-3
Nickel	7.82E+1	3.7E-5	NA	NA	1.1E-4	2.00E-2	5.35E-3
Silver	1.46E+1	6.9E-6	NA	NA	2.0E-5	5.00E-3	4.01E-3
Thallium	1.02E+0	4.8E-7	NA	NA	1.4E-6	NA	NA
Vanadium	3.02E+1	1.4E-5	NA	NA	4.1E-5	7.00E-3	5.91E-3
1,1,1-TRICHLOROETHANE	6.21E-3	2.9E-9	NA	NA	8.5E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	3.1E-9	6.00E-1	1.8E-9	8.9E-9	9.00E-3	9.89E-7
2-METHYLNAPHTHALENE	2.15E-1	1.0E-7	NA	NA	2.9E-7	NA	NA
4,4'-DDD	7.03E-2	3.3E-8	2.40E-1	7.9E-9	9.6E-8	NA	NA
4,4'-DDE	1.50E-1	7.0E-8	3.40E-1	2.4E-8	2.0E-7	NA	NA
4,4'-DDT	2.25E-1	1.1E-7	3.40E-1	3.6E-8	3.1E-7	5.00E-4	6.18E-4
ACENAPHTHENE	2.42E-1	1.1E-7	NA	NA	3.3E-7	6.00E-2	5.53E-6
ACENAPHTHYLENE	2.27E-1	1.1E-7	NA	NA	3.1E-7	NA	NA
ACETONE	1.12E-2	5.2E-9	NA	NA	1.5E-8	1.00E-1	1.53E-7
ALDRIN	3.42E-3	1.6E-9	1.70E+1	2.7E-8	4.7E-9	3.00E-5	1.56E-4
ALPHA-CHLORDANE	4.11E-2	1.9E-8	NA	NA	5.6E-8	NA	NA
ANTHRACENE	3.37E-1	1.6E-7	NA	NA	4.6E-7	3.00E-1	1.54E-6
AROCLOR-1254	9.91E-2	4.7E-8	NA	NA	1.4E-7	NA	NA
AROCLOR-1260	1.11E-1	5.2E-8	NA	NA	1.5E-7	NA	NA
BENZO(a)ANTHRACENE	1.82E+0	8.6E-7	7.30E-1 (*)	6.2E-7	2.5E-6	NA	NA
BENZO(a)PYRENE	1.56E+0	7.3E-7	7.30E+0	5.3E-6	2.1E-6	NA	NA
BENZO(b)FLUORANTHENE	2.07E+0	9.7E-7	7.30E-1 (*)	7.1E-7	2.8E-6	NA	NA
BENZO(g,h,i)PERYLENE	1.13E+0	5.3E-7	NA	NA	1.5E-6	NA	NA
BENZO(k)FLUORANTHENE	1.19E+0	5.6E-7	7.30E-2 (*)	4.1E-8	1.6E-6	NA	NA
beta-BHC	2.61E-3	1.2E-9	NA	NA	3.6E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALA	3.93E-1	1.8E-7	1.40E-2	2.6E-9	5.4E-7	2.00E-2	2.69E-5
BUTYLBENZYLPHTHALATE	2.76E-1	1.3E-7	NA	NA	3.8E-7	2.00E-1	1.89E-6
CARBAZOLE	2.40E-1	1.1E-7	2.00E-2	2.3E-9	3.3E-7	NA	NA
CHRYSENE	1.99E+0	9.3E-7	7.30E-3	6.8E-9	2.7E-6	NA	NA
delta-BHC	2.21E-3	1.0E-9	NA	NA	3.0E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	1.2E-7	NA	NA	3.5E-7	1.00E-1	3.49E-6
DI-N-OCTYLPHTHALATE	2.50E-1	1.2E-7	NA	NA	3.4E-7	2.00E-2	1.71E-5
DIBENZ(a,h)ANTHRACENE	3.13E-1	1.5E-7	7.30E+0 (*)	1.1E-6	4.3E-7	NA	NA
DIBENZOFURAN	2.36E-1	1.1E-7	NA	NA	3.2E-7	4.00E-3	8.09E-5
DIELDRIN	1.90E-2	8.9E-9	1.60E+1	1.4E-7	2.6E-8	5.00E-5	5.21E-4
DIETHYLPHTHALATE	2.43E-1	1.1E-7	NA	NA	3.3E-7	8.00E-1	4.17E-7
ENDOSULFAN-II	1.19E-2	5.6E-9	NA	NA	1.6E-8	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	2.6E-9	NA	NA	7.6E-9	NA	NA
ENDRIN	1.88E-2	8.8E-9	NA	NA	2.6E-8	3.00E-4	8.60E-5
ENDRIN-ALDEHYDE	3.14E-2	1.5E-8	NA	NA	4.3E-8	NA	NA
ENDRIN-KETONE	8.37E-3	3.9E-9	NA	NA	1.1E-8	NA	NA
FLUORANTHENE	2.87E+0	1.3E-6	NA	NA	3.9E-6	4.00E-2	9.84E-5
FLUORENE	2.42E-1	1.1E-7	NA	NA	3.3E-7	4.00E-2	8.27E-6
gama-BHC	2.11E-3	9.9E-10	NA	NA	2.9E-9	NA	NA
GAMMA-CHLORDANE	3.11E-2	1.5E-8	NA	NA	4.3E-8	NA	NA
HEPTACHLOR	2.89E-3	1.4E-9	4.50E+0	6.1E-9	4.0E-9	5.00E-4	7.91E-6
HEPTACHLOR-EPOXIDE	4.45E-3	2.1E-9	9.10E+0	1.9E-8	6.1E-9	1.30E-5	4.69E-4
INDENO(1,2,3-cd)PYRENE	9.35E-1	4.4E-7	7.30E-1 (*)	3.2E-7	1.3E-6	NA	NA
METHOXYCHLOR	2.95E-2	1.4E-8	NA	NA	4.0E-8	5.00E-3	8.07E-6
METHYLENE-CHLORIDE	1.29E-2	6.0E-9	7.50E-3	4.5E-11	1.8E-8	6.00E-2	2.94E-7
NAPTHALENE	2.13E-1	1.0E-7	NA	NA	2.9E-7	4.00E-2	7.30E-6
PHENANTHRENE	1.18E+0	5.5E-7	NA	NA	1.6E-6	NA	NA
PYRENE	2.80E+0	1.3E-6	NA	NA	3.8E-6	3.00E-2	1.28E-4
TETRACHLOROETHENE	6.85E-3	3.2E-9	5.20E-2	1.7E-10	9.4E-9	1.00E-2	9.39E-7
TOLUENE	8.03E-3	3.8E-9	NA	NA	1.1E-8	2.00E-1	5.50E-8
XYLENE	6.81E-3	3.2E-9	NA	NA	9.3E-9	2.00E+0	4.66E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	1.2E-10	1.50E+5	1.7E-5	3.4E-10	NA	NA
TOTAL				**5.76E-5**			**0.40**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncarcer)
NA : Toxicity criterion not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 4.7E-7
Summary Intake Factor, noncancer: 1.4E-6

Source: Ecology and Environment, Inc. 1994

Table S.B-33
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times FI \times ED \times EF}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
IR	100	(mg/day)
ED	*9*	*(years)*
EF	350	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	1.9E-3	NA	NA	1.5E-2	NA	NA
Antimony	2.10E+1	3.7E-6	NA	NA	2.9E-5	4.00E-4	7.2E-2
Arsenic	3.75E+1	6.6E-6	1.75E+0	1.2E-5	5.1E-5	3.00E-4	1.7E-1
Barium	9.37E+2	1.6E-4	NA	NA	1.3E-3	7.00E-2	1.8E-2
Beryllium	4.18E-1	7.4E-8	4.30E+0	3.2E-7	5.7E-7	5.00E-3	1.1E-4
Cadmium	1.41E+1	2.5E-6	NA	NA	1.9E-5	5.00E-4	3.9E-2
Cobalt	1.75E+1	3.1E-6	NA	NA	2.4E-5	6.00E-2	4.0E-4
Copper	2.04E+3	3.6E-4	NA	NA	2.8E-3	3.70E-2	7.6E-2
Cyanide	1.75E+0	3.1E-7	NA	NA	2.4E-6	2.00E-2	1.2E-4
Iron	1.54E+5	2.7E-2	NA	NA	2.1E-1	NA	NA
Mercury	1.96E+0	3.5E-7	NA	NA	2.7E-6	3.00E-4	9.0E-3
Nickel	7.82E+1	1.4E-5	NA	NA	1.1E-4	2.00E-2	5.4E-3
Silver	1.46E+1	2.6E-6	NA	NA	2.0E-5	5.00E-3	4.0E-3
Thallium	1.02E+0	1.8E-7	NA	NA	1.4E-6	NA	NA
Vanadium	3.02E+1	5.3E-6	NA	NA	4.1E-5	7.00E-3	5.9E-3
1,1,1-TRICHLOROETHANE	6.21E-3	1.1E-9	NA	NA	8.5E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1.1E-9	6.00E-1	6.9E-10	8.9E-9	9.00E-3	9.9E-7
2-METHYLNAPHTHALENE	2.15E-1	3.8E-8	NA	NA	2.9E-7	NA	NA
4,4'-DDD	7.03E-2	1.2E-8	2.40E-1	3.0E-9	9.6E-8	NA	NA
4,4'-DDE	1.50E-1	2.6E-8	3.40E-1	9.0E-9	2.0E-7	NA	NA
4,4'-DDT	2.25E-1	4.0E-8	3.40E-1	1.4E-8	3.1E-7	5.00E-4	6.2E-4
ACENAPHTHENE	2.42E-1	4.3E-8	NA	NA	3.3E-7	6.00E-2	5.5E-6
ACENAPHTHYLENE	2.27E-1	4.0E-8	NA	NA	3.1E-7	NA	NA
ACETONE	1.12E-2	2.0E-9	NA	NA	1.5E-8	1.00E-1	1.5E-7
ALDRIN	3.42E-3	6.0E-10	1.70E+1	1.0E-8	4.7E-9	3.00E-5	1.6E-4
ALPHA-CHLORDANE	4.11E-2	7.2E-9	NA	NA	5.6E-8	NA	NA
ANTHRACENE	3.37E-1	5.9E-8	NA	NA	4.6E-7	3.00E-1	1.5E-6
AROCLOR-1254	9.91E-2	1.7E-8	NA	NA	1.4E-7	NA	NA
AROCLOR-1260	1.11E-1	2.0E-8	NA	NA	1.5E-7	NA	NA
BENZO(a)ANTHRACENE	1.82E+0	3.2E-7	7.30E-1 (*)	2.3E-7	2.5E-6	NA	NA
BENZO(a)PYRENE	1.56E+0	2.7E-7	7.30E+0	2.0E-6	2.1E-6	NA	NA
BENZO(b)FLUORANTHENE	2.07E+0	3.7E-7	7.30E-1 (*)	2.7E-7	2.8E-6	NA	NA
BENZO(g,h,i)PERYLENE	1.13E+0	2.0E-7	NA	NA	1.5E-6	NA	NA
BENZO(k)FLUORANTHENE	1.19E+0	2.1E-7	7.30E-2 (*)	1.5E-8	1.6E-6	NA	NA
beta-BHC	2.61E-3	4.6E-10	NA	NA	3.6E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	3.93E-1	6.9E-8	1.40E-2	9.7E-10	5.4E-7	2.00E-2	2.7E-5
BUTYLBENZYLPHTHALATE	2.76E-1	4.9E-8	NA	NA	3.8E-7	2.00E-1	1.9E-6
CARBAZOLE	2.40E-1	4.2E-8	2.00E-2	8.5E-10	3.3E-7	NA	NA
CHRYSENE	1.99E+0	3.5E-7	7.30E-3 (*)	2.6E-9	2.7E-6	NA	NA
delta-BHC	2.21E-3	3.9E-10	NA	NA	3.0E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	4.5E-8	NA	NA	3.5E-7	1.00E-1	3.5E-6
DI-N-OCTYLPHTHALATE	2.50E-1	4.4E-8	NA	NA	3.4E-7	2.00E-2	1.7E-5
DIBENZ(a,h)ANTHRACENE	3.13E-1	5.5E-8	7.30E+0 (*)	4.0E-7	4.3E-7	NA	NA
DIBENZOFURAN	2.36E-1	4.2E-8	NA	NA	3.2E-7	4.00E-3	8.1E-5
DIELDRIN	1.90E-2	3.3E-9	1.60E+1	5.4E-8	2.6E-8	5.00E-5	5.2E-4
DIETHYLPHTHALATE	2.43E-1	4.3E-8	NA	NA	3.3E-7	8.00E-1	4.2E-7
ENDOSULFAN-II	1.19E-2	2.1E-9	NA	NA	1.6E-8	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	9.8E-10	NA	NA	7.6E-9	NA	NA
ENDRIN	1.88E-2	3.3E-9	NA	NA	2.6E-8	3.00E-4	8.6E-5
ENDRIN-ALDEHYDE	3.14E-2	5.5E-9	NA	NA	4.3E-8	NA	NA
ENDRIN-KETONE	8.37E-3	1.5E-9	NA	NA	1.1E-8	NA	NA
FLUORANTHENE	2.87E+0	5.1E-7	NA	NA	3.9E-6	4.00E-2	9.8E-5
FLUORENE	2.42E-1	4.3E-8	NA	NA	3.3E-7	4.00E-2	8.3E-6
gama-BHC	2.11E-3	3.7E-10	NA	NA	2.9E-9	NA	NA
GAMMA-CHLORDANE	3.11E-2	5.5E-9	NA	NA	4.3E-8	NA	NA
HEPTACHLOR	2.89E-3	5.1E-10	4.50E+0	2.3E-9	4.0E-9	5.00E-4	7.9E-6
HEPTACHLOR-EPOXIDE	4.45E-3	7.8E-10	9.10E+0	7.1E-9	6.1E-9	1.30E-5	4.7E-4
INDENO(1,2,3-cd)PYRENE	9.35E-1	1.6E-7	7.30E-1 (*)	1.2E-7	1.3E-6	NA	NA
METHOXYCHLOR	2.95E-2	5.2E-9	NA	NA	4.0E-8	5.00E-3	8.1E-6
METHYLENE-CHLORIDE	1.29E-2	2.3E-9	7.50E-3	1.7E-11	1.8E-8	6.00E-2	2.9E-7
NAPTHALENE	2.13E-1	3.8E-8	NA	NA	2.9E-7	4.00E-2	7.3E-6
PHENANTHRENE	1.18E+0	2.1E-7	NA	NA	1.6E-6	NA	NA
PYRENE	2.80E+0	4.9E-7	NA	NA	3.8E-6	3.00E-2	1.3E-4
TETRACHLOROETHENE	6.85E-3	1.2E-9	5.20E-2	6.3E-11	9.4E-9	1.00E-2	9.4E-7
TOLUENE	8.03E-3	1.4E-9	NA	NA	1.1E-8	2.00E-1	5.5E-8
XYLENE	6.81E-3	1.2E-9	NA	NA	9.3E-9	2.00E+0	4.7E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	4.4E-11	1.50E+5	6.6E-6	3.4E-10	NA	NA
TOTAL				**2.16E-5**			**0.40**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncarcer)
NA : Toxicity criterion not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.0E-6
Summary Intake Factor, noncancer: 1.2E-5

Source: Ecology and Environment, Inc. 1994

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Table S.B-34
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose
DA_{event}: dose absorbed per unit area per event
ED: exposure duration
EF: exposure frequency
CF: conversion factor
SA: skin surface area
AF: adherence factor
ABS: absorption factor
BW: body weight
AT: averaging time

Exposure Factors:

CS*	–	(mg/kg)
DA_{event}*	–	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	–	(unitless)
ED	6	(years)
EF	350	(days/year)
SA	1800	(cm^2)
CF	1E-6	(kg/mg)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	DAD (mg/kg-day)	Dermal SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	DAD (mg/kg-day)	Subchronic Dermal RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	0.1%	1.0E-4	NA	NA	1.2E-3	NA	NA
Antimony	2.10E+1	0.1%	1.9E-7	NA	NA	1.9E-7	2.00E-5 (b)	9.7E-3
Arsenic	3.75E+1	0.1%	3.5E-7	3.50E+1 (a)	1.21E-5 (a)	3.5E-7	1.50E-5 (b)	2.3E-2
Barium	9.37E+2	0.1%	8.7E-6	NA	NA	8.7E-6	3.50E-3 (b)	2.5E-3
Beryllium	4.18E-1	0.1%	3.9E-9	8.60E+1 (a)	3.3E-7	3.9E-9	2.50E-4 (b)	1.5E-5
Cadmium	1.41E+1	0.1%	1.3E-7	NA	NA	1.3E-7	NA	NA
Cobalt	1.75E+1	0.1%	1.6E-7	NA	NA	1.6E-7	NA	NA
Cyanide	1.75E+0	0.1%	1.6E-8	NA	NA	1.6E-8	1.00E-3 (b)	1.6E-5
Iron	1.54E+5	0.1%	1.4E-3	NA	NA	1.4E-3	NA	NA
Mercury	1.96E+0	0.1%	1.8E-8	NA	NA	1.8E-8	1.50E-5 (b)	1.2E-3
Nickel	7.82E+1	0.1%	7.2E-7	NA	NA	7.2E-7	1.00E-3 (b)	7.2E-4
Silver	1.46E+1	0.1%	1.4E-7	NA	NA	1.4E-7	NA	NA
Thallium	1.02E+0	0.1%	9.4E-9	NA	NA	9.4E-9	NA	NA
Vanadium	3.02E+1	0.1%	2.8E-7	NA	NA	2.8E-7	3.50E-4 (b)	8.0E-4
1,1,1-TRICHLOROETHANE	6.21E-3	1%	5.7E-10	NA	NA	5.7E-11	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1%	6.0E-10	6.00E-1	3.6E-10	6.0E-11	9.00E-3	6.7E-9
2-METHYLNAPHTHALENE	2.15E-1	1%	2.0E-8	NA	NA	2.0E-9	NA	NA
4,4'-DDD	7.03E-2	1%	6.5E-9	2.40E-1	1.6E-9	6.5E-10	NA	NA
4,4'-DDE	1.50E-1	1%	1.4E-8	3.40E-1	4.7E-9	1.4E-9	NA	NA
4,4'-DDT	2.25E-1	1%	2.1E-8	3.40E-1	7.1E-9	2.1E-9	5.00E-4	4.2E-6
ACETONE	1.12E-2	1%	1.0E-9	NA	NA	1.0E-10	1.00E+0	1.0E-10
ALDRIN	3.42E-3	1%	3.2E-10	1.70E+1	5.4E-9	3.2E-11	3.00E-5	1.1E-6
ALPHA-CHLORDANE	4.11E-2	1%	3.8E-9	NA	NA	3.8E-10	NA	NA
AROCLOR-1254	9.91E-2	1%	9.2E-9	NA	NA	9.2E-10	NA	NA
AROCLOR-1260	1.11E-1	1%	1.0E-8	NA	NA	1.0E-9	NA	NA
beta-BHC	2.61E-3	1%	2.4E-10	NA	NA	2.4E-11	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	3.93E-1	1%	3.6E-8	1.40E-2	5.1E-10	3.6E-9	2.00E-2	1.8E-7
BUTYLBENZYLPHTHALATE	2.76E-1	1%	2.6E-8	NA	NA	2.6E-9	2.00E+0	1.3E-9
CARBAZOLE	2.40E-1	1%	2.2E-8	2.00E-2	4.4E-10	2.2E-9	NA	NA
delta-BHC	2.21E-3	1%	2.0E-10	NA	NA	2.0E-11	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	1%	2.4E-8	NA	NA	2.4E-9	1.00E+0	2.4E-9
DI-N-OCTYLPHTHALATE	2.50E-1	1%	2.3E-8	NA	NA	2.3E-9	2.00E-2	1.2E-7
DIBENZOFURAN	2.36E-1	1%	2.2E-8	NA	NA	2.2E-9	NA	NA
DIELDRIN	1.90E-2	1%	1.8E-9	NA	NA	1.8E-10	5.00E-5	3.5E-6
DIETHYLPHTHALATE	2.43E-1	1%	2.2E-8	NA	NA	2.2E-9	8.00E+0	2.8E-10
ENDOSULFAN-II	1.19E-2	1%	1.1E-9	NA	NA	1.1E-10	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	1%	5.1E-10	NA	NA	5.1E-11	NA	NA
ENDRIN	1.88E-2	1%	1.7E-9	NA	NA	1.7E-10	3.00E-4	5.8E-7
ENDRIN-ALDEHYDE	3.14E-2	1%	2.9E-9	NA	NA	2.9E-10	NA	NA
ENDRIN-KETONE	8.37E-3	1%	7.7E-10	NA	NA	7.7E-11	NA	NA
gama-BHC	2.11E-3	1%	2.0E-10	NA	NA	2.0E-11	NA	NA
GAMMA-CHLORDANE	3.11E-2	1%	2.9E-9	NA	NA	2.9E-10	NA	NA
HEPTACHLOR	2.89E-3	1%	2.7E-10	4.50E+0	1.2E-9	2.7E-11	5.00E-4	5.3E-8
HEPTACHLOR-EPOXIDE	4.45E-3	1%	4.1E-10	9.10E+0	3.7E-9	4.1E-11	1.30E-5	3.2E-6
METHOXYCHLOR	2.95E-2	1%	2.7E-9	NA	NA	2.7E-10	5.00E-3	5.4E-8
METHYLENE-CHLORIDE	1.29E-2	1%	1.2E-9	7.50E-3	8.9E-12	1.2E-10	6.00E-2	2.0E-9
NAPTHALENE	2.13E-1	1%	2.0E-8	NA	NA	2.0E-9	NA	NA
PHENANTHRENE	1.18E+0	1%	1.1E-7	NA	NA	1.1E-8	NA	NA
TETRACHLOROETHENE	6.85E-3	1%	6.3E-10	5.20E-2	3.3E-11	6.3E-11	1.00E-1	6.3E-10
TOLUENE	8.03E-3	1%	7.4E-10	NA	NA	7.4E-11	2.00E+0	3.7E-11
XYLENE	6.81E-3	1%	6.3E-10	NA	NA	6.3E-11	2.00E+0	3.1E-11
2,3,7,8-TCDD (Equiv)	2.48E-4	1%	2.3E-11	1.50E+5	3.4E-6	2.3E-12	NA	NA
TOTAL					**1.59E-5**			**0.04**

NA : Toxicity criterion not available.

(a) The oral slope factor for metals was divided by 5% to adjust for absorption efficiency
(b) The oral reference dose for metals was multiplied by 5% to adjust for absorption efficiency

Summary Intake Factor, cancer: 9.2E-6
Summary Intake Factor, noncancer: 1.1E-4

Source: Ecology and Environment, Inc. 1994

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Table S.B-35
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose
DA_{event}: dose absorbed per unit area per event
ED: exposure duration
EF: exposure frequency
CF: conversion factor
SA: skin surface area
AF: adherence factor
ABS: absorption factor
BW: body weight
AT: averaging time

Exposure Factors:

CS*	–	(mg/kg)
DA_{event}*	–	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	–	(unitless)
ED	24	(years)
EF	350	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	Carcinogenic Effects: DAD (mg/kg-day)	Carcinogenic Effects: Dermal SF $(mg/kg\text{-}day)^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: DAD (mg/kg-day)	Noncarcinogenic Effects: Dermal RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
Aluminum	1.10E+4	0.1%	2.6E-4	NA	NA	7.5E-4	NA	NA
Antimony	2.10E+1	0.1%	4.9E-7	NA	NA	1.4E-6	2.00E-5 (b)	7.2E-2
Arsenic	3.75E+1	0.1%	8.8E-7	3.50E+1 (a)	3.1E-5	2.6E-6	1.50E-5 (b)	1.7E-1
Barium	9.37E+2	0.1%	2.2E-5	NA	NA	6.4E-5	3.50E-3 (b)	1.8E-2
Beryllium	4.18E-1	0.1%	9.8E-9	8.60E+1 (a)	8.4E-7	2.9E-8	2.50E-4 (b)	1.1E-4
Cadmium	1.41E+1	0.1%	3.3E-7	NA	NA	9.6E-7	NA	NA
Cobalt	1.75E+1	0.1%	4.1E-7	NA	NA	1.2E-6	NA	NA
Cyanide	1.75E+0	0.1%	4.1E-8	NA	NA	1.2E-7	1.00E-3 (b)	1.2E-4
Iron	1.54E+5	0.1%	3.6E-3	NA	NA	1.1E-2	NA	NA
Mercury	1.96E+0	0.1%	4.6E-8	NA	NA	1.3E-7	1.50E-5 (b)	9.0E-3
Nickel	7.82E+1	0.1%	1.8E-6	NA	NA	5.4E-6	1.00E-3 (b)	5.4E-3
Silver	1.46E+1	0.1%	3.4E-7	NA	NA	1.0E-6	NA	NA
Thallium	*1.02E+0*	*0.1%*	*2.4E-8*	*NA*	*NA*	*7.0E-8*	*NA*	*NA*
Vanadium	3.02E+1	0.1%	7.1E-7	NA	NA	2.1E-6	3.50E-4 (b)	5.9E-3
1,1,1-TRICHLOROETHANE	6.21E-3	1%	1.5E-9	NA	NA	4.3E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1%	1.5E-9	6.00E-1	9.2E-10	4.4E-9	9.00E-03	4.9E-7
2-METHYLNAPHTHALENE	2.15E-1	1%	5.0E-8	NA	NA	1.5E-7	NA	NA
4,4'-DDD	7.03E-2	1%	1.6E-8	2.40E-1	4.0E-9	4.8E-8	NA	NA
4,4'-DDE	1.50E-1	1%	3.5E-8	3.40E-1	1.2E-8	1.0E-7	NA	NA
4,4'-DDT	2.25E-1	1%	5.3E-8	3.40E-1	1.8E-8	1.5E-7	5.00E-04	3.1E-4
ACETONE	1.12E-2	1%	2.6E-9	NA	NA	7.6E-9	1.00E+00	7.6E-9
ALDRIN	3.42E-3	1%	8.0E-10	1.70E+1	1.4E-8	2.3E-9	3.00E-05	7.8E-5
ALPHA-CHLORDANE	4.11E-2	1%	9.6E-9	NA	NA	2.8E-8	NA	NA
AROCLOR-1254	9.91E-2	1%	2.3E-8	NA	NA	6.8E-8	NA	NA
AROCLOR-1260	1.11E-1	1%	2.6E-8	NA	NA	7.6E-8	NA	NA
beta-BHC	2.61E-3	1%	6.1E-10	NA	NA	1.8E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	3.93E-1	1%	9.2E-8	1.40E-2	1.3E-9	2.7E-7	2.00E-02	1.3E-5
BUTYLBENZYLPHTHALATE	2.76E-1	1%	6.5E-8	NA	NA	1.9E-7	2.00E+00	9.5E-8
CARBAZOLE	2.40E-1	1%	5.6E-8	2.00E-2	1.1E-9	1.6E-7	NA	NA
delta-BHC	2.21E-3	1%	5.2E-10	NA	NA	1.5E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	1%	6.0E-8	NA	NA	1.7E-7	1.00E+00	1.7E-7
DI-N-OCTYLPHTHALATE	2.50E-1	1%	5.9E-8	NA	NA	1.7E-7	2.00E-02	8.6E-6
DIBENZOFURAN	2.36E-1	1%	5.5E-8	NA	NA	1.6E-7	NA	NA
DIELDRIN	1.90E-2	1%	4.5E-9	NA	NA	1.3E-8	5.00E-05	2.6E-4
DIETHYLPHTHALATE	2.43E-1	1%	5.7E-8	NA	NA	1.7E-7	8.00E+00	2.1E-8
ENDOSULFAN-II	1.19E-2	1%	2.8E-9	NA	NA	8.2E-9	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	1%	1.3E-9	NA	NA	3.8E-9	NA	NA
ENDRIN	1.88E-2	1%	4.4E-9	NA	NA	1.3E-8	3.00E-04	4.3E-5
ENDRIN-ALDEHYDE	3.14E-2	1%	7.4E-9	NA	NA	2.2E-8	NA	NA
ENDRIN-KETONE	8.37E-3	1%	2.0E-9	NA	NA	5.7E-9	NA	NA
gama-BHC	2.11E-3	1%	5.0E-10	NA	NA	1.4E-9	NA	NA
GAMMA-CHLORDANE	3.11E-2	1%	7.3E-9	NA	NA	2.1E-8	NA	NA
HEPTACHLOR	2.89E-3	1%	6.8E-10	4.50E+0	3.1E-9	2.0E-9	5.00E-04	4.0E-6
HEPTACHLOR-EPOXIDE	4.45E-3	1%	1.0E-9	9.10E+0	9.5E-9	3.1E-9	1.30E-05	2.3E-4
METHOXYCHLOR	2.95E-2	1%	6.9E-9	NA	NA	2.0E-8	5.00E-03	4.0E-6
METHYLENE-CHLORIDE	1.28E-2	1%	3.0E-9	7.50E-3	2.3E-11	8.8E-9	6.00E-02	1.5E-7
NAPTHALENE	2.13E-1	1%	5.0E-8	NA	NA	1.5E-7	NA	NA
PHENANTHRENE	1.18E+0	1%	2.8E-7	NA	NA	8.1E-7	NA	NA
TETRACHLOROETHENE	*6.65E-3*	*1%*	*1.6E-9*	*5.20E-2*	*8.4E-11*	*4.7E-9*	*1.00E-01*	*4.7E-8*
TOLUENE	6.03E-3	1%	1.9E-9	NA	NA	5.5E-9	2.00E+00	2.8E-9
XYLENE	6.81E-3	1%	1.6E-9	NA	NA	4.7E-9	2.00E+00	2.3E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	1%	5.8E-11	1.50E+5	8.7E-6	1.7E-10	NA	NA
TOTAL					**4.3SE-5**			**0.36**

NA : Toxicity criterion not available.

(a) The oral slope factor for metals was divided by 5% to adjust for absorption efficiency
(b) The oral reference dose for metals was multiplied by 5% to adjust for absorption efficiency

Source: Ecology and Environment, Inc. 1994

Summary Intake Factor, cancer: 2.3E-5
Summary Intake Factor, noncancer: 6.8E-5

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Table S.B-36
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose
DA_{event}: dose absorbed per unit area per event
ED: exposure duration
EF: exposure frequency
CF: conversion factor
SA: skin surface area
AF: adherence factor
ABS: absorption factor
BW: body weight
AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	--	(unitless)
ED	9	(years)
EF	350	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	DAD (mg/kg-day)	Dermal SF $(mg/kg-day)^{-1}$	Cancer Risk	DAD (mg/kg-day)	Dermal RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	0.1%	9.7E-5	NA	NA	7.5E-4	NA	NA
Antimony	2.10E+1	0.1%	1.8E-7	NA	NA	1.4E-6	2.0E-5 (b)	7.2E-2
Arsenic	3.75E+1	0.1%	3.3E-7	3.50E+1 (a)	1.2E-5	2.6E-6	1.5E-5 (b)	1.7E-1
Barium	9.37E+2	0.1%	8.2E-6	NA	NA	6.4E-5	3.5E-3 (b)	1.8E-2
Beryllium	4.18E-1	0.1%	3.7E-9	8.60E+1 (a)	3.2E-7	2.9E-8	2.5E-4 (b)	1.1E-4
Cadmium	1.41E+1	0.1%	1.2E-7	NA	NA	9.6E-7	NA	NA
Cobalt	1.75E+1	0.1%	1.5E-7	NA	NA	1.2E-6	NA	NA
Cyanide	1.75E+0	0.1%	1.5E-8	NA	NA	1.2E-7	1.0E-3 (b)	1.2E-4
Iron	1.54E+5	0.1%	1.4E-3	NA	NA	1.1E-2	NA	NA
Mercury	1.96E+0	0.1%	1.7E-8	NA	NA	1.3E-7	1.5E-5 (b)	9.0E-3
Nickel	7.82E+1	0.1%	6.9E-7	NA	NA	5.4E-6	1.0E-3 (b)	5.4E-3
Silver	1.46E+1	0.1%	1.3E-7	NA	NA	1.0E-6	NA	NA
Thallium	1.02E+0	0.1%	8.9E-9	NA	NA	7.0E-8	NA	NA
Vanadium	3.02E+1	0.1%	2.7E-7	NA	NA	2.1E-6	3.5E-4 (b)	5.9E-3
1,1,1-TRICHLOROETHANE	6.21E-3	1%	5.5E-10	NA	NA	4.3E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1%	5.7E-10	6.00E-1	3.4E-10	4.4E-9	9.00E-3	4.9E-7
2-METHYLNAPHTHALENE	2.15E-1	1%	1.9E-8	NA	NA	1.5E-7	NA	NA
4,4'-DDD	7.03E-2	1%	6.2E-9	2.40E-1	1.5E-9	4.8E-8	NA	NA
4,4'-DDE	1.50E-1	1%	1.3E-8	3.40E-1	4.5E-9	1.0E-7	NA	NA
4,4'-DDT	2.25E-1	1%	2.0E-8	3.40E-1	6.8E-9	1.5E-7	5.00E-4	3.1E-4
ACETONE	1.12E-2	1%	9.8E-10	NA	NA	7.6E-9	1.00E+0	7.6E-9
ALDRIN	3.42E-3	1%	3.0E-10	1.70E+1	5.1E-9	2.3E-9	3.00E-5	7.8E-5
ALPHA-CHLORDANE	4.11E-2	1%	3.6E-9	NA	NA	2.8E-8	NA	NA
AROCLOR-1254	9.91E-2	1%	8.7E-9	NA	NA	6.8E-8	NA	NA
AROCLOR-1260	1.11E-1	1%	9.8E-9	NA	NA	7.6E-8	NA	NA
beta-BHC	2.61E-3	1%	2.3E-10	NA	NA	1.8E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	3.93E-1	1%	3.5E-8	1.40E-2	4.8E-10	2.7E-7	2.00E-2	1.3E-5
BUTYLBENZYLPHTHALATE	2.76E-1	1%	2.4E-8	NA	NA	1.9E-7	2.00E+0	9.5E-8
CARBAZOLE	2.40E-1	1%	2.1E-8	2.00E-2	4.2E-10	1.6E-7	NA	NA
delta-BHC	2.21E-3	1%	1.9E-10	NA	NA	1.5E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	1%	2.2E-8	NA	NA	1.7E-7	1.00E+0	1.7E-7
DI-N-OCTYLPHTHALATE	2.50E-1	1%	2.2E-8	NA	NA	1.7E-7	2.00E-2	8.6E-6
DIBENZOFURAN	2.36E-1	1%	2.1E-8	NA	NA	1.6E-7	NA	NA
DIELDRIN	1.90E-2	1%	1.7E-9	NA	NA	1.3E-8	5.00E-5	2.6E-4
DIETHYLPHTHALATE	2.43E-1	1%	2.1E-8	NA	NA	1.7E-7	8.00E+0	2.1E-8
ENDOSULFAN-II	1.19E-2	1%	1.0E-9	NA	NA	8.2E-9	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	1%	4.9E-10	NA	NA	3.8E-9	NA	NA
ENDRIN	1.88E-2	1%	1.7E-9	NA	NA	1.3E-8	3.00E-4	4.3E-5
ENDRIN-ALDEHYDE	3.14E-2	1%	2.8E-9	NA	NA	2.2E-8	NA	NA
ENDRIN-KETONE	8.37E-3	1%	7.4E-10	NA	NA	5.7E-9	NA	NA
gama-BHC	2.11E-3	1%	1.9E-10	NA	NA	1.4E-9	NA	NA
GAMMA-CHLORDANE	3.11E-2	1%	2.7E-9	NA	NA	2.1E-8	NA	NA
HEPTACHLOR	2.89E-3	1%	2.5E-10	4.50E+0	1.1E-9	2.0E-9	5.00E-4	4.0E-6
HEPTACHLOR-EPOXIDE	4.45E-3	1%	3.9E-10	9.10E+0	3.6E-9	3.1E-9	1.30E-5	2.3E-4
METHOXYCHLOR	2.95E-2	1%	2.6E-9	NA	NA	2.0E-8	5.00E-3	4.0E-6
METHYLENE-CHLORIDE	1.29E-2	1%	1.1E-9	7.50E-3	8.5E-12	8.8E-9	6.00E-2	1.5E-7
NAPTHALENE	2.13E-1	1%	1.9E-8	NA	NA	1.5E-7	NA	NA
PHENANTHRENE	1.18E+0	1%	1.0E-7	NA	NA	8.1E-7	NA	NA
TETRACHLOROETHENE	6.85E-3	1%	6.0E-10	5.20E-2	3.1E-11	4.7E-9	1.00E-1	4.7E-8
TOLUENE	8.03E-3	1%	7.1E-10	NA	NA	5.5E-9	2.00E+0	2.8E-9
XYLENE	6.81E-3	1%	6.0E-10	NA	NA	4.7E-9	2.00E+0	2.3E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	1%	2.2E-11	1.50E+5	3.3E-6	1.7E-10	NA	NA
TOTAL					**1.67E-5**			**0.36**

NA : Toxicity criterion not available.

(a) The oral slope factor for metals was divided by 5% to adjust for absorption efficiency
(b) The oral reference dose for metals was multiplied by 5% to adjust for absorption efficiency

Summary Intake Factor, cancer: 8.8E-6
Summary Intake Factor, noncancer: 6.8E-5

Source: Ecology and Environment, Inc. 1994

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Table S.B-37
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Inhalation of Outdoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air	EF: exposure frequency
IR: inhalation rate	BW: body weight
ED: exposure duration	AT: averaging time
FI: fraction inhaled from source	

Exposure Factors:

CA*	–	(mg/m^3)
IR	5	(m^3/day)
ED	6	(years)
EF	350	(days/year)
FI	1	unitless
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-day})^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,2,4-TRIMETHYLBENZENE	1.38E-3	3.5E-5	NA	NA	4.1E-4	NA	NA
BENZENE	4.28E-3	1.1E-4	2.90E-2	3.2E-6	1.3E-3	NA	NA
CHLOROMETHANE	8.90E-4	2.3E-5	6.30E-3	1.4E-7	2.7E-4	NA	NA
ETHYLBENZENE	9.81E-4	2.5E-5	NA	NA	2.9E-4	2.85E-1	1.0E-3
FREON 11	1.94E-3	5.0E-5	NA	NA	5.8E-4	NA	NA
FREON 12	2.81E-3	7.2E-5	NA	NA	8.4E-4	NA	NA
M,P-XYLENE	3.03E-3	7.8E-5	NA	NA	9.1E-4	NA	NA
O-XYLENE	1.09E-3	2.8E-5	NA	NA	3.3E-4	NA	NA
TOLUENE	4.92E-3	1.3E-4	NA	NA	1.5E-3	1.10E-1	1.3E-2
TOTAL				**3.33E-6**			**1.44E-2**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.6E-2
Summary Intake Factor, noncancer: 3.0E-1

Source: Ecology and Environment, Inc. 1994

Table S.B-38

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE

Future Adult Residential RME Scenario: Inhalation of Outdoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air
IR: inhalation rate
ED: exposure duration
FI: fraction inhaled from contaminated source
EF: exposure frequency
BW: body weight
AT: averaging time

Exposure Factors:

CA*	--	(mg/m^3)
IR	20	(m^3/day)
ED	24	(years)
EF	350	(days/year)
FI	1	unitless
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg-day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,2,4-TRIMETHYLBENZENE	1.38E-3	1.3E-4	NA	NA	3.8E-4	NA	NA
BENZENE	4.28E-3	4.0E-4	2.90E-2	1.2E-5	1.2E-3	NA	NA
CHLOROMETHANE	8.90E-4	8.4E-5	6.30E-3	5.3E-7	2.4E-4	NA	NA
ETHYLBENZENE	9.81E-4	9.2E-5	NA	NA	2.7E-4	2.85E-1	9.4E-4
FREON 11	1.94E-3	1.8E-4	NA	NA	5.3E-4	NA	NA
FREON 12	2.81E-3	2.6E-4	NA	NA	7.7E-4	NA	NA
M,P-XYLENE	3.03E-3	2.8E-4	NA	NA	8.3E-4	NA	NA
O-XYLENE	1.09E-3	1.0E-4	NA	NA	3.0E-4	NA	NA
TOLUENE	4.92E-3	4.6E-4	NA	NA	1.3E-3	1.10E-1	1.2E-2
TOTAL				**1.22E-5**			**1.32E-2**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 9.4E-2
Summary Intake Factor, noncancer: 2.7E-1

Source: Ecology and Environment, Inc. 1994

Table S.B-39

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Inhalation of Outdoor Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CA: chemical conc. in air
IR: inhalation rate
ED: exposure duration
FI: fraction inhaled from source
EF: exposure frequency
BW: body weight
AT: averaging time

Exposure Factors:

CA*	--	(mg/m^3)
IR	20	(m^3/day)
ED	9	(years)
EF	350	(days/year)
FI	1	unitless
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-day})^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,2,4-TRIMETHYLBENZENE	1.38E-3	4.9E-5	NA	NA	3.8E-4	NA	NA
BENZENE	4.28E-3	1.5E-4	2.90E-2	4.4E-6	1.2E-3	NA	NA
CHLOROMETHANE	8.90E-4	3.1E-5	6.30E-3	2.0E-7	2.4E-4	NA	NA
ETHYLBENZENE	9.81E-4	3.5E-5	NA	NA	2.7E-4	2.85E-1	9.4E-4
FREON 11	1.94E-3	6.8E-5	NA	NA	5.3E-4	NA	NA
FREON 12	2.81E-3	9.9E-5	NA	NA	7.7E-4	NA	NA
M,P-XYLENE	3.03E-3	1.1E-4	NA	NA	8.3E-4	NA	NA
O-XYLENE	1.09E-3	3.8E-5	NA	NA	3.0E-4	NA	NA
TOLUENE	4.92E-3	1.7E-4	NA	NA	1.3E-3	1.10E-1	1.2E-2
TOTAL		**4.57E-6**					**1.32E-2**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 3.5E-2
Summary Intake Factor, noncancer: 2.7E-1

Source: Ecology and Environment, Inc. 1994

Table S.B-40
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Ingestion of Drinking Water (Shallow Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times EF \times FI}{BW \times AT}$$

CW: chemical conc. in water	FI: fraction ingested
IR: intake rate	BW: body weight
ED: exposure duration	AT: averaging time
EF: exposure frequency	

Exposure Factors:

CW*	--	(mg/L)
IR	1	(L/day)
ED	6	(years)
EF	350	(days/year)
FI	1	(unitless)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	2.93E+1	1.5E-1	NA	NA	1.8E+0	NA	NA
ARSENIC	8.48E-2	4.4E-4	1.75E+0	7.6E-4	5.1E-3	3.00E-4	1.69E+1
BARIUM	4.66E+0	2.4E-2	NA	NA	2.8E-1	7.00E-2	3.99E+0
BERYLLIUM	2.99E-3	1.5E-5	4.30E+0	6.6E-5	1.8E-4	5.00E-3	3.58E-2
CADMIUM	2.12E-2	1.1E-4	NA	NA	1.3E-3	5.00E-4	2.54E+0
CALCIUM	2.86E+2	1.5E+0	NA	NA	1.7E+1	NA	NA
CHROMIUM	1.82E-1	9.3E-4	NA	NA	1.1E-2	5.00E-3	2.18E+0
COBALT	4.12E-2	2.1E-4	NA	NA	2.5E-3	6.00E-2	4.12E-2
COPPER	7.69E-1	4.0E-3	NA	NA	4.6E-2	3.70E-2	1.25E+0
CYANIDE	5.33E-2	2.7E-4	NA	NA	3.2E-3	2.00E-2	1.60E-1
IRON	1.64E+2	8.4E-1	NA	NA	9.8E+0	NA	NA
LEAD	6.64E+0	3.4E-2	NA	NA	4.0E-1	NA	NA
MANGANESE	1.95E+0	1.0E-2	NA	NA	1.2E-1	1.40E-1	8.37E-1
MERCURY	1.67E-2	8.6E-5	NA	NA	1.0E-3	3.00E-4	3.33E+0
NICKEL	1.08E-1	5.5E-4	NA	NA	6.5E-3	2.00E-2	3.23E-1
POTASSIUM	9.54E+1	4.9E-1	NA	NA	5.7E+0	NA	NA
SELENIUM	5.36E-2	2.8E-4	NA	NA	3.2E-3	5.00E-3	6.42E-1
SILVER	1.12E-2	5.8E-5	NA	NA	6.7E-4	5.00E-3	1.34E-1
VANADIUM	1.03E-1	5.3E-4	NA	NA	6.2E-3	7.00E-3	8.86E-1
ZINC	1.17E+1	6.0E-2	NA	NA	7.0E-1	3.00E-1	2.34E+0
1,4-DICHLOROBENZENE	4.0E-3	2.1E-5	2.40E-2	4.9E-7	2.4E-4	NA	NA
2,4-DIMETHYLPHENOL	3.7E-3	1.9E-5	NA	NA	2.2E-4	2.00E-2	1.10E-2
4,4'-DDE	8.3E-5	4.3E-7	3.40E-1	1.5E-7	5.0E-6	NA	NA
4-METHYLPHENOL	5.7E-3	2.9E-5	NA	NA	3.4E-4	5.00E-3	6.79E-2
ACENAPHTHENE	3.6E-3	1.9E-5	NA	NA	2.2E-4	6.00E-2	3.63E-3
ACETONE	6.0E-3	3.1E-5	NA	NA	3.6E-4	1.00E-1	3.60E-3
ALPHA-CHLORDANE	3.7E-5	1.9E-7	NA	NA	2.2E-6	NA	NA
BENZO(a)ANTHRACENE	3.5E-3	1.8E-5	7.30E-1 (*)	1.3E-5	2.1E-4	NA	NA
BENZO(b)FLUORANTHENE	2.1E-3	1.1E-5	7.30E-1 (*)	7.9E-6	1.3E-4	NA	NA
CHRYSENE	3.6E-3	1.8E-5	7.30E-3 (*)	1.4E-7	2.2E-4	NA	NA
FLUORANTHENE	2.3E-3	1.2E-5	NA	NA	1.4E-4	4.00E-2	3.45E-3
FLUORENE	3.6E-3	1.8E-5	NA	NA	2.2E-4	4.00E-2	5.39E-3
GAMMA-CHLORDANE	4.3E-5	2.2E-7	NA	NA	2.6E-6	NA	NA
N-NITROSODIPHENYLAMINE	3.5E-3	1.8E-5	4.90E-3	8.9E-8	2.1E-4	NA	NA
NAPTHALENE	4.0E-3	2.1E-5	NA	NA	2.4E-4	4.00E-2	5.99E-3
PHENANTHRENE	2.3E-3	1.2E-5	NA	NA	1.4E-4	NA	NA
PHENOL	3.6E-3	1.9E-5	NA	NA	2.2E-4	6.00E-1	3.63E-4
PYRENE	2.7E-3	1.4E-5	NA	NA	1.6E-4	3.00E-2	5.33E-3
TOTAL				**8.50E-4**			**35.7**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies

Summary Intake Factor, cancer: 5.1E-3
Summary Intake Factor, noncancer: 6.0E-2

Source: Ecology and Environment, Inc. 1994

Table S.B-41
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Ingestion of Drinking Water (ShallowWells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times EF \times FI}{BW \times AT}$$

CW: chemical conc. in water
IR: intake rate
ED: exposure duration
EF: exposure frequency
FI: fraction ingested
BW: body weight
AT: averaging time

Exposure Factors:

CW*	--	(mg/L)
IR	2	(L/day)
ED	24	(years)
EF	350	(days/year)
FI	*1*	*(unitless)*
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	2.93E+1	2.8E-1	NA	NA	8.0E-1	NA	NA
ARSENIC	8.48E-2	8.0E-4	1.75E+0	1.4E-3	2.3E-3	3.00E-4	7.74E+0
BARIUM	4.66E+0	4.4E-2	NA	NA	1.3E-1	7.00E-2	1.83E+0
BERYLLIUM	2.99E-3	2.8E-5	4.30E+0	1.2E-4	8.2E-5	5.00E-3	1.64E-2
CADMIUM	2.12E-2	2.0E-4	NA	NA	5.8E-4	5.00E-4	1.16E+0
CALCIUM	2.86E+2	2.7E+0	NA	NA	7.8E+0	NA	NA
CHROMIUM	1.82E-1	1.7E-3	NA	NA	5.0E-3	5.00E-3	9.97E-1
COBALT	4.12E-2	3.9E-4	NA	NA	1.1E-3	6.00E-2	1.88E-2
COPPER	7.69E-1	7.2E-3	NA	NA	2.1E-2	3.70E-2	5.70E-1
CYANIDE	5.33E-2	5.0E-4	NA	NA	1.5E-3	2.00E-2	7.31E-2
IRON	1.64E+2	1.5E+0	NA	NA	4.5E+0	NA	NA
LEAD	6.64E+0	6.2E-2	NA	NA	1.8E-1	NA	NA
MANGANESE	1.95E+0	1.8E-2	NA	NA	5.4E-2	1.40E-1	3.82E-1
MERCURY	1.67E-2	1.6E-4	NA	NA	4.6E-4	3.00E-4	1.52E+0
NICKEL	1.08E-1	1.0E-3	NA	NA	3.0E-3	2.00E-2	1.48E-1
POTASSIUM	9.54E+1	9.0E-1	NA	NA	2.6E+0	NA	NA
SELENIUM	5.36E-2	5.0E-4	NA	NA	1.5E-3	5.00E-3	2.94E-1
SILVER	1.12E-2	1.1E-4	NA	NA	3.1E-4	5.00E-3	6.14E-2
VANADIUM	1.03E-1	9.7E-4	NA	NA	2.8E-3	7.00E-3	4.05E-1
ZINC	1.17E+1	1.1E-1	NA	NA	3.2E-1	3.00E-1	1.07E+0
1,4-DICHLOROBENZENE	4.00E-3	3.8E-5	2.40E-2	9.0E-7	1.1E-4	NA	NA
2,4-DIMETHYLPHENOL	3.67E-3	3.4E-5	NA	NA	1.0E-4	2.00E-2	5.02E-3
4,4'-DDE	8.33E-5	7.8E-7	3.40E-1	2.7E-7	2.3E-6	NA	NA
4-METHYLPHENOL	5.67E-3	5.3E-5	NA	NA	1.6E-4	5.00E-3	3.11E-2
ACENAPHTHENE	3.63E-3	3.4E-5	NA	NA	1.0E-4	6.00E-2	1.66E-3
ACETONE	6.00E-3	5.6E-5	NA	NA	1.6E-4	1.00E-1	1.64E-3
ALPHA-CHLORDANE	3.67E-5	3.4E-7	NA	NA	1.0E-6	NA	NA
BENZO(a)ANTHRACENE	3.53E-3	3.3E-5	7.30E-1 (*)	2.4E-5	9.7E-5	NA	NA
BENZO(b)FLUORANTHENE	2.10E-3	2.0E-5	7.30E-1 (*)	1.4E-5	5.8E-5	NA	NA
CHRYSENE	3.60E-3	3.4E-5	7.30E-3 (*)	2.5E-7	9.9E-5	NA	NA
FLUORANTHENE	2.30E-3	2.2E-5	NA	NA	6.3E-5	4.00E-2	1.58E-3
FLUORENE	3.60E-3	3.4E-5	NA	NA	9.9E-5	4.00E-2	2.47E-3
GAMMA-CHLORDANE	4.27E-5	4.0E-7	NA	NA	1.2E-6	NA	NA
N-NITROSODIPHENYLAMIN	3.53E-3	3.3E-5	4.90E-3	1.6E-7	9.7E-5	NA	NA
NAPTHALENE	4.00E-3	3.8E-5	NA	NA	1.1E-4	4.00E-2	2.74E-3
PHENANTHRENE	2.30E-3	2.2E-5	NA	NA	6.3E-5	NA	NA
PHENOL	3.63E-3	3.4E-5	NA	NA	1.0E-4	6.00E-1	1.66E-4
PYRENE	2.67E-3	2.5E-5	NA	NA	7.3E-5	3.00E-2	2.44E-3
TOTAL				**1.55E-3**			**16.3**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies

Summary Intake Factor, cancer: 9.4E-3
Summary Intake Factor, noncancer: 2.7E-2

Source: Ecology and Environment, Inc. 1994

Table S.B-42
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Ingestion of Drinking Water (Shallow Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times EF \times FI}{BW \times AT}$$

CW: chemical conc. in water	FI: fraction ingested
IR: intake rate	BW: body weight
ED: exposure duration	AT: averaging time
EF: exposure frequency	

Exposure Factors:

CW*	--	(mg/L)
IR	1.4	(L/day)
ED	9	(years)
EF	350	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	2.93E+1	7.2E-2	NA	NA	5.6E-1	NA	NA
ARSENIC	8.48E-2	2.1E-4	1.75E+0	3.7E-4	1.6E-3	3.00E-4	5.42E+0
BARIUM	4.66E+0	1.1E-2	NA	NA	8.9E-2	7.00E-2	1.28E+0
BERYLLIUM	2.99E-3	7.4E-6	4.30E+0	3.2E-5	5.7E-5	5.00E-3	1.15E-2
CADMIUM	2.12E-2	5.2E-5	NA	NA	4.1E-4	5.00E-4	8.12E-1
CALCIUM	2.86E+2	7.1E-1	NA	NA	5.5E+0	NA	NA
CHROMIUM	1.82E-1	4.5E-4	NA	NA	3.5E-3	5.00E-3	6.98E-1
COBALT	4.12E-2	1.0E-4	NA	NA	7.9E-4	6.00E-2	1.32E-2
COPPER	7.69E-1	1.9E-3	NA	NA	1.5E-2	3.70E-2	3.99E-1
CYANIDE	5.33E-2	1.3E-4	NA	NA	1.0E-3	2.00E-2	5.11E-2
IRON	1.64E+2	4.0E-1	NA	NA	3.1E+0	NA	NA
LEAD	6.64E+0	1.6E-2	NA	NA	1.3E-1	NA	NA
MANGANESE	1.95E+0	4.8E-3	NA	NA	3.7E-2	1.40E-1	2.68E-1
MERCURY	1.67E-2	4.1E-5	NA	NA	3.2E-4	3.00E-4	1.07E+0
NICKEL	1.08E-1	2.7E-4	NA	NA	2.1E-3	2.00E-2	1.03E-1
POTASSIUM	9.54E+1	2.4E-1	NA	NA	1.8E+0	NA	NA
SELENIUM	5.36E-2	1.3E-4	NA	NA	1.0E-3	5.00E-3	2.06E-1
SILVER	1.12E-2	2.8E-5	NA	NA	2.1E-4	5.00E-3	4.30E-2
VANADIUM	1.03E-1	2.6E-4	NA	NA	2.0E-3	7.00E-3	2.83E-1
ZINC	1.17E+1	2.9E-2	NA	NA	2.2E-1	3.00E-1	7.50E-1
1,4-DICHLOROBENZENE	4.00E-3	9.9E-6	2.40E-2	2.4E-7	7.7E-5	NA	NA
2,4-DIMETHYLPHENOL	3.67E-3	9.0E-6	NA	NA	7.0E-5	2.00E-2	3.52E-3
4,4'-DDE	8.33E-5	2.1E-7	3.40E-1	7.0E-8	1.6E-6	NA	NA
4-METHYLPHENOL	5.67E-3	1.4E-5	NA	NA	1.1E-4	5.00E-3	2.17E-2
ACENAPHTHENE	3.63E-3	9.0E-6	NA	NA	7.0E-5	6.00E-2	1.16E-3
ACETONE	6.00E-3	1.5E-5	NA	NA	1.2E-4	1.00E-1	1.15E-3
ALPHA-CHLORDANE	3.67E-5	9.0E-8	NA	NA	7.0E-7	NA	NA
BENZO(a)ANTHRACENE	3.53E-3	8.7E-6	7.30E-1 (*)	6.4E-6	6.8E-5	NA	NA
BENZO(b)FLUORANTHENE	2.10E-3	5.2E-6	7.30E-1 (*)	3.8E-6	4.0E-5	NA	NA
CHRYSENE	3.60E-3	8.9E-6	7.30E-3 (*)	6.5E-8	6.9E-5	NA	NA
FLUORANTHENE	2.30E-3	5.7E-6	NA	NA	4.4E-5	4.00E-2	1.10E-3
FLUORENE	3.60E-3	8.9E-6	NA	NA	6.9E-5	4.00E-2	1.73E-3
GAMMA-CHLORDANE	4.27E-5	1.1E-7	NA	NA	8.2E-7	NA	NA
N-NITROSODIPHENYLAMIN	3.53E-3	8.7E-6	4.90E-3	4.3E-8	6.8E-5	NA	NA
NAPTHALENE	4.00E-3	9.9E-6	NA	NA	7.7E-5	4.00E-2	1.92E-3
PHENANTHRENE	2.30E-3	5.7E-6	NA	NA	4.4E-5	NA	NA
PHENOL	3.63E-3	9.0E-6	NA	NA	7.0E-5	6.00E-1	1.16E-4
PYRENE	2.67E-3	6.6E-6	NA	NA	5.1E-5	3.00E-2	1.70E-3
TOTAL				**4.08E-4**			**11.4**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies

Summary Intake Factor, cancer: 2.5E-3
Summary Intake Factor, noncancer: 1.9E-2

Source: Ecology and Environment, Inc. 1994

001160.0749

Table S.B-43
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Ingestion of Drinking Water (Deep Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times EF \times FI}{BW \times AT}$$

CW: chemical conc. in water
IR: intake rate
ED: exposure duration
EF: exposure frequency
FI: fraction ingested
BW: body weight
AT: averaging time

Exposure Factors:

CW*	–	(mg/L)
IR	1	(L/day)
ED	6	(years)
EF	350	(days/year)
FI	1	(unitless)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	*Exposure Point* Concentration (mg/L)	LADI (mg/kg-day)	*Oral* SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	*Oral* RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	7.65E-1	3.9E-3	NA	NA	4.6E-2	NA	NA
CALCIUM	1.46E+2	7.5E-1	NA	NA	8.8E+0	NA	NA
POTASSIUM	9.70E+1	5.0E-1	NA	NA	5.8E+0	NA	NA
SELENIUM	1.05E-1	5.4E-4	NA	NA	6.3E-3	5.00E-3	1.25E+0
VANADIUM	1.90E-2	9.7E-5	NA	NA	1.1E-3	7.00E-3	1.62E-1
ZINC	7.44E-2	3.8E-4	NA	NA	4.5E-3	3.00E-1	1.49E-2
2-METHYLPHENOL	1.85E-2	9.5E-5	NA	NA	1.1E-3	5.00E-2	2.22E-2
4,4'-DDD	2.43E-4	1.2E-6	2.40E-1	3.0E-7	1.5E-5	NA	NA
4,4'-DDT	3.28E-4	1.7E-6	3.40E-1	5.7E-7	2.0E-5	5.00E-4	3.93E-2
4-METHYLPHENOL	3.00E-3	1.5E-5	NA	NA	1.8E-4	5.00E-3	3.60E-2
ACETONE	1.65E-2	8.5E-5	NA	NA	9.9E-4	1.00E-1	9.89E-3
DI-N-OCTYLPHTHALATE	7.00E-3	3.6E-5	NA	NA	4.2E-4	2.00E-2	2.10E-2
DIETHYLPHTHALATE	3.50E-3	1.8E-5	NA	NA	2.1E-4	8.00E-1	2.62E-4
DIMETHYLPHTHALATE	1.70E-2	8.7E-5	NA	NA	1.0E-3	1.00E+1	1.02E-4
N-NITROSODIPHENYLAMIN	6.00E-3	3.1E-5	4.90E-3	1.5E-7	3.6E-4	NA	NA
NAPTHALENE	3.00E-3	1.5E-5	NA	NA	1.8E-4	4.00E-2	4.49E-3
PHENOL	3.10E-2	1.6E-4	NA	NA	1.9E-3	6.00E-1	3.10E-3
TOTAL				**1.02E-6**			**1.6**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 5.1E-3
Summary Intake Factor, noncancer: 6.0E-2

Source: Ecology and Environment, Inc. 1994

Table S.B-44
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Ingestion of Drinking Water (Deep Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times EF \times FI}{BW \times AT}$$

CW: chemical conc. in water	FI: fraction ingested
IR: intake rate	BW: body weight
ED: exposure duration	AT: averaging time
EF: exposure frequency	

Exposure Factors:

CW*	--	(mg/L)
IR	2	(L/day)
ED	24	(years)
EF	350	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	7.65E-1	7.2E-3	NA	NA	2.1E-2	NA	NA
CALCIUM	1.46E+2	1.4E+0	NA	NA	4.0E+0	NA	NA
POTASSIUM	9.70E+1	9.1E-1	NA	NA	2.7E+0	NA	NA
SELENIUM	1.05E-1	9.8E-4	NA	NA	2.9E-3	5.00E-3	5.73E-1
VANADIUM	1.90E-2	1.8E-4	NA	NA	5.2E-4	7.00E-3	7.42E-2
ZINC	7.44E-2	7.0E-4	NA	NA	2.0E-3	3.00E-1	6.79E-3
2-METHYLPHENOL	1.85E-2	1.7E-4	NA	NA	5.1E-4	5.00E-2	1.01E-2
4,4'-DDD	2.43E-4	2.3E-6	2.40E-1	5.5E-7	6.6E-6	NA	NA
4,4'-DDT	3.28E-4	3.1E-6	3.40E-1	1.0E-6	9.0E-6	5.00E-4	1.79E-2
4-METHYLPHENOL	3.00E-3	2.8E-5	NA	NA	8.2E-5	5.00E-3	1.64E-2
ACETONE	1.65E-2	1.5E-4	NA	NA	4.5E-4	1.00E-1	4.52E-3
DI-N-OCTYLPHTHALATE	7.00E-3	6.6E-5	NA	NA	1.9E-4	2.00E-2	9.59E-3
DIETHYLPHTHALATE	3.50E-3	3.3E-5	NA	NA	9.6E-5	8.00E-1	1.20E-4
DIMETHYLPHTHALATE	1.70E-2	1.6E-4	NA	NA	4.7E-4	1.00E+1	4.66E-5
N-NITROSODIPHENYLAMINE	6.00E-3	5.6E-5	4.90E-3	2.8E-7	1.6E-4	NA	NA
NAPTHALENE	3.00E-3	2.8E-5	NA	NA	8.2E-5	4.00E-2	2.05E-3
PHENOL	3.10E-2	2.9E-4	NA	NA	8.5E-4	6.00E-1	1.42E-3
TOTAL				**1.87E-6**			**0.7**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 9.4E-3
Summary Intake Factor, noncancer: 2.7E-2

Source: Ecology and Environment, Inc. 1994

001160.0751

Table S.B-45
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Ingestion of Drinking Water (Deep Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times EF \times FI}{BW \times AT}$$

CW: chemical conc. in water	FI: fraction ingested
IR: intake rate	BW: body weight
ED: exposure duration	AT: averaging time
EF: exposure frequency	

Exposure Factors:

CW*	--	(mg/L)
IR	1.4	(L/day)
ED	9	(years)
EF	350	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	7.65E-1	1.9E-3	NA	NA	1.5E-2	NA	NA
CALCIUM	1.46E+2	3.6E-1	NA	NA	2.8E+0	NA	NA
POTASSIUM	9.70E+1	2.4E-1	NA	NA	1.9E+0	NA	NA
SELENIUM	1.05E-1	2.6E-4	NA	NA	2.0E-3	5.00E-3	4.01E-1
VANADIUM	1.90E-2	4.7E-5	NA	NA	3.6E-4	7.00E-3	5.19E-2
ZINC	7.44E-2	1.8E-4	NA	NA	1.4E-3	3.00E-1	4.76E-3
2-METHYLPHENOL	1.85E-2	4.6E-5	NA	NA	3.5E-4	5.00E-2	7.10E-3
4,4'-DDD	2.43E-4	6.0E-7	2.40E-1	1.4E-7	4.7E-6	NA	NA
4,4'-DDT	3.28E-4	8.1E-7	3.40E-1	2.7E-7	6.3E-6	5.00E-4	1.26E-2
4-METHYLPHENOL	3.00E-3	7.4E-6	NA	NA	5.8E-5	5.00E-3	1.15E-2
ACETONE	1.65E-2	4.1E-5	NA	NA	3.2E-4	1.00E-1	3.16E-3
DI-N-OCTYLPHTHALATE	7.00E-3	1.7E-5	NA	NA	1.3E-4	2.00E-2	6.71E-3
DIETHYLPHTHALATE	3.50E-3	8.6E-6	NA	NA	6.7E-5	8.00E-1	8.39E-5
DIMETHYLPHTHALATE	1.70E-2	4.2E-5	NA	NA	3.3E-4	1.00E+1	3.26E-5
N-NITROSODIPHENYLAMIN	6.00E-3	1.5E-5	4.90E-3	7.2E-8	1.2E-4	NA	NA
NAPTHALENE	3.00E-3	7.4E-6	NA	NA	5.8E-5	4.00E-2	1.44E-3
PHENOL	3.10E-2	7.6E-5	NA	NA	5.9E-4	6.00E-1	9.91E-4
TOTAL				**4.91E-7**			**0.5**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 2.5E-3
Summary Intake Factor, noncancer: 1.9E-2

Source: Ecology and Environment, Inc. 1994

001160.0752

Table S.B-46
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Inhalation of Drinking Water (Shallow Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times ET \times EF \times K \times FI}{BW \times AT}$$

CW: chemical conc. in water	EF: exposure frequency
IR: inhalation rate	K: volatization factor
ED: exposure duration	BW: body weight
ET: exposure time	AT: averaging time
FI: fraction inhalated from contaminated source	

Exposure Factors:

CW*	--	(mg/L)
IR	0.21	(m^3/hour)
ED	6	(years)
EF	350	(days/year)
ET	0.25	(hours/day)
FI	1	(unitless)
K	0.5	(L/m^3)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Inhalation SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,4-DICHLOROBENZENE	4.00E-3	5.4E-7	NA	NA	6.3E-6	2.28E-1	2.76E-5
2,4-DIMETHYLPHENOL	3.67E-3	4.9E-7	NA	NA	5.8E-6	NA	NA
4,4'-DDE	8.33E-5	1.1E-8	NA	NA	1.3E-7	NA	NA
4-METHYLPHENOL	5.67E-3	7.6E-7	NA	NA	8.9E-6	NA	NA
ACENAPHTHENE	3.63E-3	4.9E-7	NA	NA	5.7E-6	NA	NA
ACETONE	6.00E-3	8.1E-7	NA	NA	9.4E-6	NA	NA
ALPHA-CHLORDANE	3.67E-5	4.9E-9	NA	NA	5.8E-8	NA	NA
BENZO(a)ANTHRACENE	3.53E-3	4.8E-7	NA	NA	5.6E-6	NA	NA
BENZO(b)FLUORANTHENE	2.10E-3	2.8E-7	NA	NA	3.3E-6	NA	NA
CHRYSENE	3.60E-3	4.9E-7	NA	NA	5.7E-6	NA	NA
FLUORANTHENE	2.30E-3	3.1E-7	NA	NA	3.6E-6	NA	NA
FLUORENE	3.60E-3	4.9E-7	NA	NA	5.7E-6	NA	NA
GAMMA-CHLORDANE	4.27E-5	5.8E-9	NA	NA	6.7E-8	NA	NA
N-NITROSODIPHENYLAMINE	3.53E-3	4.8E-7	NA	NA	5.6E-6	NA	NA
NAPTHALENE	4.00E-3	5.4E-7	NA	NA	6.3E-6	NA	NA
PHENANTHRENE	2.30E-3	3.1E-7	NA	NA	3.6E-6	NA	NA
PHENOL	3.63E-3	4.9E-7	NA	NA	5.7E-6	NA	NA
PYRENE	2.67E-3	3.6E-7	NA	NA	4.2E-6	NA	NA
TOTAL				**NA**			**0.000028**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 1.3E-4
Summary Intake Factor, noncancer: 1.6E-3

Source: Ecology and Environment, Inc. 1994

Table S.B-47
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Inhalation of Drinking Water (Shallow Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times ET \times EF \times K \times FI}{BW \times AT}$$

CW: chemical conc. in water	EF: exposure frequency
IR: inhalation rate	K: volatization factor
ED: exposure duration	BW: body weight
ET: exposure time	AT: averaging time
FI: fraction inhalated from contaminated source	

Exposure Factors:

CW*	--	(mg/L)
IR	0.83	(m^3/hour)
ED	24	(years)
EF	350	(days/year)
ET	0.25	(hours/day)
FI	1	(unitless)
K	0.5	(L/m^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Inhalation SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,4-DICHLOROBENZENE	4.00E-3	1.9E-6	NA	NA	5.7E-6	2.28E-1	2.49E-5
2,4-DIMETHYLPHENOL	3.67E-3	1.8E-6	NA	NA	5.2E-6	NA	NA
4,4'-DDE	8.33E-5	4.1E-8	NA	NA	1.2E-7	NA	NA
4-METHYLPHENOL	5.67E-3	2.8E-6	NA	NA	8.1E-6	NA	NA
ACENAPHTHENE	3.63E-3	1.8E-6	NA	NA	5.2E-6	NA	NA
ACETONE	6.00E-3	2.9E-6	NA	NA	8.5E-6	NA	NA
ALPHA-CHLORDANE	3.67E-5	1.8E-8	NA	NA	5.2E-8	NA	NA
BENZO(a)ANTHRACENE	3.53E-3	1.7E-6	NA	NA	5.0E-6	NA	NA
BENZO(b)FLUORANTHENE	2.10E-3	1.0E-6	NA	NA	3.0E-6	NA	NA
CHRYSENE	3.60E-3	1.8E-6	NA	NA	5.1E-6	NA	NA
FLUORANTHENE	2.30E-3	1.1E-6	NA	NA	3.3E-6	NA	NA
FLUORENE	3.60E-3	1.8E-6	NA	NA	5.1E-6	NA	NA
GAMMA-CHLORDANE	4.27E-5	2.1E-8	NA	NA	6.1E-8	NA	NA
N-NITROSODIPHENYLAMINE	3.53E-3	1.7E-6	NA	NA	5.0E-6	NA	NA
NAPTHALENE	4.00E-3	1.9E-6	NA	NA	5.7E-6	NA	NA
PHENANTHRENE	2.30E-3	1.1E-6	NA	NA	3.3E-6	NA	NA
PHENOL	3.63E-3	1.8E-6	NA	NA	5.2E-6	NA	NA
PYRENE	2.67E-3	1.3E-6	NA	NA	3.8E-6	NA	NA
TOTAL				**NA**			**0.000025**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Source: Ecology and Environment, Inc. 1994

Summary Intake Factor, cancer: 4.9E-4
Summary Intake Factor, noncancer: 1.4E-3

001160.0754

Table S.B-48
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Inhalation of Drinking Water (Shallow Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times ET \times EF \times K \times FI}{BW \times AT}$$

CW: chemical conc. in water	EF: exposure frequency
IR: inhalation rate	K: volatization factor
ED: exposure duration	BW: body weight
ET: exposure time	AT: averaging time
FI: fraction inhalated from contaminated source	

Exposure Factors:

CW*	--	(mg/L)
IR	0.83	(m^3/hour)
ED	9	(years)
EF	350	(days/year)
ET	0.17	(hours/day)
FI	1	(unitless)
K	0.5	(L/m^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

Chemical	Exposure Point Concentration (mg/L)	Carcinogenic Effects: LADI (mg/kg-day)	Carcinogenic Effects: Inhalation SF (mg/kg-day)$^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: CDI (mg/kg-day)	Noncarcinogenic Effects: Inhalation RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
1,4-DICHLOROBENZENE	4.00E-3	5.0E-7	NA	NA	3.9E-6	2.28E-1	1.70E-5
2,4-DIMETHYLPHENOL	3.67E-3	4.6E-7	NA	NA	3.5E-6	NA	NA
4,4'-DDE	8.33E-5	1.0E-8	NA	NA	8.1E-8	NA	NA
4-METHYLPHENOL	5.67E-3	7.0E-7	NA	NA	5.5E-6	NA	NA
ACENAPHTHENE	3.63E-3	4.5E-7	NA	NA	3.5E-6	NA	NA
ACETONE	6.00E-3	7.5E-7	NA	NA	5.8E-6	NA	NA
ALPHA-CHLORDANE	3.67E-5	4.6E-9	NA	NA	3.5E-8	NA	NA
BENZO(a)ANTHRACENE	3.53E-3	4.4E-7	NA	NA	3.4E-6	NA	NA
BENZO(b)FLUORANTHENE	2.10E-3	2.6E-7	NA	NA	2.0E-6	NA	NA
CHRYSENE	3.60E-3	4.5E-7	NA	NA	3.5E-6	NA	NA
FLUORANTHENE	2.30E-3	2.9E-7	NA	NA	2.2E-6	NA	NA
FLUORENE	3.60E-3	4.5E-7	NA	NA	3.5E-6	NA	NA
GAMMA-CHLORDANE	4.27E-5	5.3E-9	NA	NA	4.1E-8	NA	NA
N-NITROSODIPHENYLAMINE	3.53E-3	4.4E-7	NA	NA	3.4E-6	NA	NA
NAPTHALENE	4.00E-3	5.0E-7	NA	NA	3.9E-6	NA	NA
PHENANTHRENE	2.30E-3	2.9E-7	NA	NA	2.2E-6	NA	NA
PHENOL	3.63E-3	4.5E-7	NA	NA	3.5E-6	NA	NA
PYRENE	2.67E-3	3.3E-7	NA	NA	2.6E-6	NA	NA
TOTAL				**NA**			**0.000017**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 1.2E-4
Summary Intake Factor, noncancer: 9.7E-4

Source: Ecology and Environment, Inc. 1994

001160.0755

Table S.B-49
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Inhalation of Drinking Water (Deep Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times ET \times EF \times K \times FI}{BW \times AT}$$

CW: chemical conc. in water	EF: exposure frequency
IR: inhalation rate	K: volatization factor
ED: exposure duration	BW: body weight
ET: exposure time	AT: averaging time
FI: fraction inhalated from contaminated source	

Exposure Factors:

CW*	–	(mg/L)
IR	0.21	(m^3/hour)
ED	6	(years)
EF	350	(days/year)
ET	0.25	(hours/day)
FI	1	(unitless)
K	0.5	(L/m^3)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Inhalation SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
2-METHYLPHENOL	1.85E-2	2.5E-6	NA	NA	2.9E-5	NA	NA
4,4'-DDD	2.43E-4	3.3E-8	NA	NA	3.8E-7	NA	NA
4,4'-DDT	3.28E-4	4.4E-8	3.4E-1	1.5E-8	5.2E-7	NA	NA
4-METHYLPHENOL	3.00E-3	4.0E-7	NA	NA	4.7E-6	NA	NA
ACETONE	1.65E-2	2.2E-6	NA	NA	2.6E-5	NA	NA
DI-N-OCTYLPHTHALATE	7.00E-3	9.4E-7	NA	NA	1.1E-5	NA	NA
DIETHYLPHTHALATE	3.50E-3	4.7E-7	NA	NA	5.5E-6	NA	NA
DIMETHYLPHTHALATE	1.70E-2	2.3E-6	NA	NA	2.7E-5	NA	NA
N-NITROSODIPHENYLAMINE	6.00E-3	8.1E-7	NA	NA	9.4E-6	NA	NA
NAPTHALENE	3.00E-3	4.0E-7	NA	NA	4.7E-6	NA	NA
PHENOL	3.10E-2	4.2E-6	NA	NA	4.9E-5	NA	NA
TOTAL				**1.50E-8**			**NA**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Source: Ecology and Environment, Inc. 1994

Summary Intake Factor, cancer:	1.3E-4
Summary Intake Factor, noncancer:	1.6E-3

001160.0756

Table S.B-50
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Inhalation of Drinking Water (Deep Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times ET \times EF \times K \times FI}{BW \times AT}$$

CW: chemical conc. in water	EF: exposure frequency
IR: inhalation rate	K: volatization factor
ED: exposure duration	BW: body weight
ET: exposure time	AT: averaging time
FI: fraction inhalated from contaminated source	

Exposure Factors:

CW*	--	(mg/L)
IR	0.83	(m^3/hour)
ED	24	(years)
EF	350	(days/year)
ET	0.25	(hours/day)
FI	1	(unitless)
K	0.5	(L/m^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
2-METHYLPHENOL	1.85E-2	9.0E-6	NA	NA	2.6E-5	NA	NA
4,4'-DDD	2.43E-4	1.2E-7	NA	NA	3.4E-7	NA	NA
4,4'-DDT	3.28E-4	1.6E-7	0.339	5.4E-8	4.7E-7	NA	NA
4-METHYLPHENOL	3.00E-3	1.5E-6	NA	NA	4.3E-6	NA	NA
ACETONE	1.65E-2	8.0E-6	NA	NA	2.3E-5	NA	NA
DI-N-OCTYLPHTHALATE	7.00E-3	3.4E-6	NA	NA	9.9E-6	NA	NA
DIETHYLPHTHALATE	3.50E-3	1.7E-6	NA	NA	5.0E-6	NA	NA
DIMETHYLPHTHALATE	1.70E-2	8.3E-6	NA	NA	2.4E-5	NA	NA
N-NITROSODIPHENYLAMINE	6.00E-3	2.9E-6	NA	NA	8.5E-6	NA	NA
NAPTHALENE	3.00E-3	1.5E-6	NA	NA	4.3E-6	NA	NA
PHENOL	3.10E-2	1.5E-5	NA	NA	4.4E-5	NA	NA
TOTAL				**5.41E-8**			**NA**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 4.9E-4
Summary Intake Factor, noncancer: 1.4E-3

Source: Ecology and Environment, Inc. 1994

Table S.B-51
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Inhalation of Drinking Water (Deep Wells)

Exposure Equation:

$$\text{Intake} = \frac{CW \times IR \times ED \times ET \times EF \times K \times FI}{BW \times AT}$$

CW: chemical conc. in water	EF: exposure frequency
IR: inhalation rate	K: volatization factor
ED: exposure duration	BW: body weight
ET: exposure time	AT: averaging time
FI: fraction inhalated from contaminated source	

Exposure Factors:

CW*	–	(mg/L)
IR	0.83	(m^3/hour)
ED	9	(years)
EF	350	(days/year)
ET	0.17	(hours/day)
FI	1	(unitless)
K	0.5	(L/m^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	LADI (mg/kg-day)	Inhalation SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
2-METHYLPHENOL	1.85E-2	2.3E-6	NA	NA	1.8E-5	NA	NA
4,4'-DDD	2.43E-4	3.0E-8	NA	NA	2.3E-7	NA	NA
4,4'-DDT	3.28E-4	4.1E-8	0.339	1.4E-8	3.2E-7	NA	NA
4-METHYLPHENOL	3.00E-3	3.7E-7	NA	NA	2.9E-6	NA	NA
ACETONE	1.65E-2	2.1E-6	NA	NA	1.6E-5	NA	NA
DI-N-OCTYLPHTHALATE	7.00E-3	8.7E-7	NA	NA	6.8E-6	NA	NA
DIETHYLPHTHALATE	3.50E-3	4.3E-7	NA	NA	3.4E-6	NA	NA
DIMETHYLPHTHALATE	1.70E-2	2.1E-6	NA	NA	1.6E-5	NA	NA
N-NITROSODIPHENYLAMINE	6.00E-3	7.5E-7	NA	NA	5.8E-6	NA	NA
NAPTHALENE	3.00E-3	3.7E-7	NA	NA	2.9E-6	NA	NA
PHENOL	3.10E-2	3.9E-6	NA	NA	3.0E-5	NA	NA
TOTAL				**1.38E-8**			**NA**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 1.2E-4
Summary Intake Factor, noncancer: 9.7E-4

Source: Ecology and Environment, Inc. 1994

001160.0758

Table S.B-52
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Dermal Contact with Ground Water (Shallow Wells)

Exposure Equation:

$$DAD = \frac{CW \times PC \times SA \times ET \times EF \times ED \times CF \times FC}{BW \times AT}$$

DAD: dermally absorbed dose	EF: exposure frequency
CW: chemical conc. in water	FC: fraction contacted
PC: permeability constant	CF: conversion factor
SA: skin surface area	BW: body weight
ET: exposure time	AT: averaging time
ED: exposure duration	

Exposure Factors:

CW*	--	(mg/L)
PC*	--	(cm/hour)
SA	7300	(cm^2)
ET	0.25	(hour/day)
EF	350	(day/year)
ED	6	(years)
FC	1	(unitless)
CF	0.001	(L/cm^3)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	Kp (cm/hr)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	2.93E+1	1.0E-3	2.7E-4	NA	NA	3.2E-3	NA	NA
ARSENIC	8.48E-2	1.0E-3	7.9E-7	1.75E+0	1.4E-6	9.3E-6	3.00E-4	3.09E-2
BARIUM	4.66E+0	1.0E-3	4.4E-5	NA	NA	5.1E-4	7.00E-2	7.29E-3
BERYLLIUM	2.99E-3	1.0E-3	2.8E-8	4.30E+0	1.2E-7	3.3E-7	5.00E-3	6.53E-5
CADMIUM	2.12E-2	1.0E-3	2.0E-7	NA	NA	2.3E-6	5.00E-4	4.63E-3
CALCIUM	2.86E+2	1.0E-3	2.7E-3	NA	NA	3.1E-2	NA	NA
CHROMIUM	1.82E-1	1.0E-3	1.7E-6	NA	NA	2.0E-5	5.00E-3	3.98E-3
COBALT	4.12E-2	1.0E-3	3.9E-7	NA	NA	4.5E-6	6.00E-2	7.51E-5
CYANIDE	5.33E-2	1.0E-3	5.0E-7	NA	NA	5.8E-6	NA	NA
IRON	1.64E+2	1.0E-3	1.5E-3	NA	NA	1.8E-2	NA	NA
MANGANESE	1.95E+0	1.0E-3	1.8E-5	NA	NA	2.1E-4	1.40E-1	1.53E-3
MERCURY	1.67E-2	1.0E-3	1.6E-7	NA	NA	1.8E-6	3.00E-4	6.08E-3
NICKEL	1.08E-1	1.0E-3	1.0E-6	NA	NA	1.2E-5	2.00E-2	5.90E-4
POTASSIUM	9.54E+1	1.0E-3	8.9E-4	NA	NA	1.0E-2	NA	NA
SELENIUM	5.36E-2	1.0E-3	5.0E-7	NA	NA	5.9E-6	5.00E-3	1.17E-3
SILVER	1.12E-2	1.0E-3	1.1E-7	NA	NA	1.2E-6	5.00E-3	2.45E-4
VANADIUM	1.03E-1	1.0E-3	9.7E-7	NA	NA	1.1E-5	7.00E-3	1.62E-3
ZINC	1.17E+1	1.0E-3	1.1E-4	NA	NA	1.3E-3	3.00E-1	4.28E-3
1,4-DICHLOROBENZENE	4.0E-3	6.2E-2	2.3E-6	2.40E-2	5.6E-8	2.7E-5	NA	NA
2,4-DIMETHYLPHENOL	3.7E-3	1.5E-2	5.2E-7	NA	NA	6.0E-6	2.00E-2	3.01E-4
4,4'-DDE	8.3E-5	2.4E-1	1.9E-7	3.40E-1	6.4E-8	2.2E-6	NA	NA
4-METHYLPHENOL	5.7E-3	NA	NA	NA	NA	NA	5.00E-3	NA
ACETONE	6.0E-3	NA	NA	NA	NA	NA	1.00E-1	NA
ALPHA-CHLORDANE	3.7E-5	4.6E-2	1.6E-8	NA	NA	1.8E-7	NA	NA
GAMMA-CHLORDANE	4.3E-5	4.6E-2	1.8E-8	NA	NA	2.1E-7	NA	NA
N-NITROSODIPHENYLAMINE	3.5E-3	3.6E-2 (a)	1.2E-6	4.90E-3	5.8E-9	1.4E-5	NA	NA
NAPTHALENE	4.0E-3	6.9E-2	2.6E-6	NA	NA	3.0E-5	4.00E-2	7.55E-4
PHENOL	3.6E-3	5.5E-3	1.9E-7	NA	NA	2.2E-6	6.00E-1	3.64E-6
TOTAL					**1.64E-6**			**0.064**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity/chemical data not available.
(a) p-Nitrosodiphenyl amine K_p value used to approximate N-nitrosodiphenylamine.

Summary Intake Factor, cancer: 9.4E-3
Summary Intake Factor, noncancer: 1.1E-1

Source: Ecology and Environment, Inc. 1994

Table S.B-53
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Dermal with Ground Water (Shallow Wells)

Exposure Equation:

$$DAD = \frac{CW \times PC \times SA \times ET \times EF \times ED \times CF \times FC}{BW \times AT}$$

DAD: dermally absorbed dose	EF: exposure frequency
CW: chemical conc. in water	FC: fraction contacted
PC: permeability constant	CF: conversion factor
SA: skin surface area	BW: body weight
ET: exposure time	AT: averaging time
ED: exposure duration	

Exposure Factors:

CW*	--	(mg/L)
PC*	--	(cm/hour)
SA	20,000	(cm^2)
ET	0.25	(hour/day)
EF	350	(day/year)
ED	24	(years)
FC	1	(unitless)
CF	0.001	(L/cm^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	Kp (cm/hr)	LADI (mg/kg-day)	Oral SF $(mg/kg-day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	2.93E+1	1.0E-3	6.9E-4	NA	NA	2.0E-3	NA	NA
ARSENIC	8.48E-2	1.0E-3	2.0E-6	1.75E+0	3.5E-6	5.8E-6	3.00E-4	1.94E-2
BARIUM	4.66E+0	1.0E-3	1.1E-4	NA	NA	3.2E-4	7.00E-2	4.56E-3
BERYLLIUM	2.99E-3	1.0E-3	7.0E-8	4.30E+0	3.0E-7	2.0E-7	5.00E-3	4.09E-5
CADMIUM	2.12E-2	1.0E-3	5.0E-7	NA	NA	1.5E-6	5.00E-4	2.90E-3
CALCIUM	2.86E+2	1.0E-3	6.7E-3	NA	NA	2.0E-2	NA	NA
CHROMIUM	1.82E-1	1.0E-3	4.3E-6	NA	NA	1.2E-5	5.00E-3	2.49E-3
COBALT	4.12E-2	1.0E-3	9.7E-7	NA	NA	2.8E-6	6.00E-2	4.70E-5
CYANIDE	5.33E-2	1.0E-3	1.3E-6	NA	NA	3.7E-6	NA	NA
IRON	1.64E+2	1.0E-3	3.8E-3	NA	NA	1.1E-2	NA	NA
MANGANESE	1.95E+0	1.0E-3	4.6E-5	NA	NA	1.3E-4	1.40E-1	9.56E-4
MERCURY	1.67E-2	1.0E-3	3.9E-7	NA	NA	1.1E-6	3.00E-4	3.80E-3
NICKEL	1.08E-1	1.0E-3	2.5E-6	NA	NA	7.4E-6	2.00E-2	3.69E-4
POTASSIUM	9.54E+1	1.0E-3	2.2E-3	NA	NA	6.5E-3	NA	NA
SELENIUM	5.36E-2	1.0E-3	1.3E-6	NA	NA	3.7E-6	5.00E-3	7.34E-4
SILVER	1.12E-2	1.0E-3	2.6E-7	NA	NA	7.7E-7	5.00E-3	1.53E-4
VANADIUM	1.03E-1	1.0E-3	2.4E-6	NA	NA	7.1E-6	7.00E-3	1.01E-3
ZINC	1.17E+1	1.0E-3	2.8E-4	NA	NA	8.0E-4	3.00E-1	2.68E-3
1,4-DICHLOROBENZENE	4.00E-3	6.2E-2	5.8E-6	2.40E-2	1.4E-7	1.7E-5	NA	NA
2,4-DIMETHYLPHENOL	3.67E-3	1.5E-2	1.3E-6	NA	NA	3.8E-6	2.00E-2	1.88E-4
4,4'-DDE	8.33E-5	2.4E-1	4.7E-7	3.40E-1	1.6E-7	1.4E-6	NA	NA
4-METHYLPHENOL	5.67E-3	NA	NA	NA	NA	NA	5.00E-3	NA
ACETONE	6.00E-3	NA	NA	NA	NA	NA	1.00E-1	NA
ALPHA-CHLORDANE	3.67E-5	4.6E-2	4.0E-8	NA	NA	1.2E-7	NA	NA
GAMMA-CHLORDANE	4.27E-5	4.6E-2	4.6E-8	NA	NA	1.3E-7	NA	NA
N-NITROSODIPHENYLAMINE	3.53E-3	3.6E-2 (a)	3.0E-6	4.90E-3	1.5E-8	8.7E-6	NA	NA
NAPTHALENE	4.00E-3	6.9E-2	6.5E-6	NA	NA	1.9E-5	4.00E-2	4.73E-4
PHENOL	3.63E-3	5.5E-3	4.7E-7	NA	NA	1.4E-6	6.00E-1	2.28E-6
TOTAL					**4.10E-6**			**0.043**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncarcer)
NA : Toxicity/chemical data not available.
(a) p-Nitrosodiphenyl amine Kp value used to approximate N-nitrosodiphenylamine.

Summary Intake Factor, cancer: 2.3E-2
Summary Intake Factor, noncancer: 6.8E-2

Source: Ecology and Environment, Inc. 1994

Table S.B-54
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Dermal Contact with Ground Water (Shallow Wells)

Exposure Equation:

$$DAD = \frac{CW \times PC \times SA \times ET \times EF \times ED \times CF \times FC}{BW \times AT}$$

DAD: dermally absorbed dose	EF: exposure frequency
CW: chemical conc. in water	FC: fraction contacted
PC: permeability constant	CF: conversion factor
SA: skin surface area	BW: body weight
ET: exposure time	AT: averaging time
ED: exposure duration	

Exposure Factors:

CW*	–	(mg/L)
PC*	–	(cm/hour)
SA	20,000	(cm^2)
ET	0.17	(hour/day)
EF	350	(day/year)
ED	9	(years)
FC	1	(unitless)
CF	0.001	(L/cm^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	Kp (cm/hr)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	2.93E+1	1.0E-3	1.8E-4	NA	NA	1.4E-3	NA	NA
ARSENIC	8.48E-2	1.0E-3	5.1E-7	1.75E+0	8.9E-7	3.9E-6	3.00E-4	1.32E-2
BARIUM	4.66E+0	1.0E-3	2.8E-5	NA	NA	2.2E-4	7.00E-2	3.10E-3
BERYLLIUM	2.99E-3	1.0E-3	1.8E-8	4.30E+0	7.7E-8	1.4E-7	5.00E-3	2.78E-5
CADMIUM	2.12E-2	1.0E-3	1.3E-7	NA	NA	9.9E-7	5.00E-4	1.97E-3
CALCIUM	2.86E+2	1.0E-3	1.7E-3	NA	NA	1.3E-2	NA	NA
CHROMIUM	1.82E-1	1.0E-3	1.1E-6	NA	NA	8.5E-6	5.00E-3	1.69E-3
COBALT	4.12E-2	1.0E-3	2.5E-7	NA	NA	1.9E-6	6.00E-2	3.20E-5
CYANIDE	5.33E-2	1.0E-3	3.2E-7	NA	NA	2.5E-6	NA	NA
IRON	1.64E+2	1.0E-3	9.8E-4	NA	NA	7.6E-3	NA	NA
MANGANESE	1.95E+0	1.0E-3	1.2E-5	NA	NA	9.1E-5	1.40E-1	6.50E-4
MERCURY	1.67E-2	1.0E-3	1.0E-7	NA	NA	7.8E-7	3.00E-4	2.59E-3
NICKEL	1.08E-1	1.0E-3	6.5E-7	NA	NA	5.0E-6	2.00E-2	2.51E-4
POTASSIUM	9.54E+1	1.0E-3	5.7E-4	NA	NA	4.4E-3	NA	NA
SELENIUM	5.36E-2	1.0E-3	3.2E-7	NA	NA	2.5E-6	5.00E-3	4.99E-4
SILVER	1.12E-2	1.0E-3	6.7E-8	NA	NA	5.2E-7	5.00E-3	1.04E-4
VANADIUM	1.03E-1	1.0E-3	6.2E-7	NA	NA	4.8E-6	7.00E-3	6.88E-4
ZINC	1.17E+1	1.0E-3	7.0E-5	NA	NA	5.5E-4	3.00E-1	1.82E-3
1,4-DICHLOROBENZENE	4.00E-3	6.2E-2	1.5E-6	2.40E-2	3.6E-8	1.2E-5	NA	NA
2,4-DIMETHYLPHENOL	3.67E-3	1.5E-2	3.3E-7	NA	NA	2.6E-6	2.00E-2	1.28E-4
4,4'-DDE	8.33E-5	2.4E-1	1.2E-7	3.40E-1	4.1E-8	9.3E-7	NA	NA
4-METHYLPHENOL	5.67E-3	NA	NA	NA	NA	NA	5.00E-3	NA
ACETONE	6.00E-3	NA	NA	NA	NA	NA	1.00E-1	NA
ALPHA-CHLORDANE	3.67E-5	4.6E-2	1.0E-8	NA	NA	7.9E-8	NA	NA
GAMMA-CHLORDANE	4.27E-5	4.6E-2	1.2E-8	NA	NA	9.1E-8	NA	NA
N-NITROSODIPHENYLAMINE	3.53E-3	3.6E-2 (a)	7.6E-7	4.90E-3	3.7E-9	5.9E-6	NA	NA
NAPTHALENE	4.00E-3	6.9E-2	1.7E-6	NA	NA	1.3E-5	4.00E-2	3.21E-4
PHENOL	3.63E-3	5.5E-3	1.2E-7	NA	NA	9.3E-7	6.00E-1	1.55E-6
					1.05E-6			**0.027**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity/chemical data not available.
(a) p-Nitrosodiphenyl amine Kp value used to approximate N-nitrosodiphenylamine.

Summary Intake Factor, cancer: 6.0E-3
Summary Intake Factor, noncancer: 4.7E-2

Source: Ecology and Environment, Inc. 1994

Table S.B-55
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Child Residential RME Scenario: Dermal Contact with Ground Water (Deep Wells)

Exposure Equation:

$$DAD = \frac{CW \times PC \times SA \times ET \times EF \times ED \times CF \times FC}{BW \times AT}$$

DAD: dermally absorbed dose	EF: exposure frequency
CW: chemical conc. in water	FC: fraction contacted
PC: permeability constant	CF: conversion factor
SA: skin surface area	BW: body weight
ET: exposure time	AT: averaging time
ED: exposure duration	

Exposure Factors:

CW*	--	(mg/L)
PC*	--	(cm/hour)
SA	7300	(cm^2)
ET	0.25	(hour/day)
EF	350	(day/year)
ED	6	(years)
FC	1	(unitless)
CF	0.001	(L/cm^3)
BW	16	(kg)
AT	25,550	(days) cancer
AT	2,190	(days) noncancer

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	Kp (cm/hr)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	7.65E-1	1.0E-3	7.2E-6	NA	NA	8.4E-5	NA	NA
CALCIUM	1.46E+2	1.0E-3	1.4E-3	NA	NA	1.6E-2	NA	NA
POTASSIUM	9.70E+1	1.0E-3	9.1E-4	NA	NA	1.1E-2	NA	NA
SELENIUM	1.05E-1	1.0E-3	9.8E-7	NA	NA	1.1E-5	5.00E-3	2.29E-3
VANADIUM	1.90E-2	1.0E-3	1.8E-7	NA	NA	2.1E-6	7.00E-3	2.96E-4
ZINC	7.44E-2	1.0E-3	7.0E-7	NA	NA	8.1E-6	NA	NA
2-METHYLPHENOL	1.85E-2	NA	NA	NA	NA	NA	5.00E-2	NA
4,4'-DDD	2.43E-4	2.8E-1	6.4E-7	2.40E-1	1.5E-7	7.4E-6	NA	NA
4,4'-DDT	3.28E-4	4.3E-1	1.3E-6	3.40E-1	4.5E-7	1.5E-5	5.00E-4	3.08E-2
4-METHYLPHENOL	3.00E-3	NA	NA	NA	NA	NA	5.00E-3	NA
ACETONE	1.65E-2	NA	NA	NA	NA	NA	1.00E-1	NA
DI-N-OCTYLPHTHALATE	7.00E-3	NA	NA	NA	NA	NA	2.00E-2	NA
DIETHYLPHTHALATE	3.50E-3	NA	NA	NA	NA	NA	8.00E-1	NA
DIMETHYLPHTHALATE	1.70E-2	NA	NA	NA	NA	NA	1.00E+1	NA
N-NITROSODIPHENYLAMINE	6.00E-3	3.60E-02 (a)	2.0E-6	4.90E-3	9.9E-9	2.4E-5	NA	NA
NAPTHALENE	3.00E-3	8.9E-2	1.9E-6	NA	NA	2.3E-5	4.00E-2	5.66E-4
PHENOL	3.10E-2	5.5E-3	1.6E-6	NA	NA	1.9E-5	6.00E-1	3.11E-5
TOTAL					**6.12E-7**			**0.034**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncarcer)
NA : Toxicity criterion not available.
(a) p-Nitrosodiphenyl amine Kp value used to approximate N-nitrosodiphenylamine.

Summary Intake Factor, cancer: 9.4E-3
Summary Intake Factor, noncancer: 1.1E-1

Source: Ecology and Environment, Inc. 1994

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Table S.B-56
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential RME Scenario: Dermal Contact with Ground Water (Deep Wells)

Exposure Equation:

$$DAD = \frac{CW \times PC \times SA \times ET \times EF \times ED \times CF \times FC}{BW \times AT}$$

DAD: dermally absorbed dose	EF: exposure frequency
CW: chemical conc. in water	FC: fraction contacted
PC: permeability constant	CF: conversion factor
SA: skin surface area	BW: body weight
ET: exposure time	AT: averaging time
ED: exposure duration	

Exposure Factors:

CW*	--	(mg/L)
PC*	--	(cm/hour)
SA	20,000	(cm^2)
ET	0.25	(hour/day)
EF	350	(day/year)
ED	24	(years)
FC	1	(unitless)
CF	0.001	(L/cm^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	8,760	(days) noncancer

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	Kp (cm/hr)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	7.65E-1	1.0E-3	1.8E-5	NA	NA	5.2E-5	NA	NA
CALCIUM	1.46E+2	1.0E-3	3.4E-3	NA	NA	1.0E-2	NA	NA
POTASSIUM	9.70E+1	1.0E-3	2.3E-3	NA	NA	6.6E-3	NA	NA
SELENIUM	1.05E-1	1.0E-3	2.5E-6	NA	NA	7.2E-6	5.00E-3	1.43E-3
VANADIUM	1.90E-2	1.0E-3	4.5E-7	NA	NA	1.3E-6	7.00E-3	1.85E-4
ZINC	7.44E-2	1.0E-3	1.7E-6	NA	NA	5.1E-6	NA	NA
2-METHYLPHENOL	1.85E-2	NA	NA	NA	NA	NA	5.00E-2	NA
4,4'-DDD	2.43E-4	2.8E-1	1.6E-6	0.24	3.8E-7	4.7E-6	NA	NA
4,4'-DDT	3.28E-4	4.3E-1	3.3E-6	0.34	1.1E-6	9.6E-6	5.00E-4	1.93E-2
4-METHYLPHENOL	3.00E-3	NA	NA	NA	NA	NA	5.00E-3	NA
ACETONE	1.65E-2	NA	NA	NA	NA	NA	1.00E-1	NA
DI-N-OCTYLPHTHALATE	7.00E-3	NA	NA	NA	NA	NA	2.00E-2	NA
DIETHYLPHTHALATE	3.50E-3	NA	NA	NA	NA	NA	8.00E-1	NA
DIMETHYLPHTHALATE	1.70E-2	NA	NA	NA	NA	NA	1.00E+1	NA
N-NITROSODIPHENYLAMINE	6.00E-3	3.60E-02 (a)	5.1E-6	0.0049	2.5E-8	1.5E-5	NA	NA
NAPTHALENE	3.00E-3	6.9E-2	4.9E-6	NA	NA	1.4E-5	4.00E-2	3.54E-4
PHENOL	3.10E-2	5.5E-3	4.0E-6	NA	NA	1.2E-5	6.00E-1	1.95E-5
TOTAL					**1.53E-6**			**0.021**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criterion not available.
(a) p-Nitrosodiphenyl amine Kp value used to approximate N-nitrosodiphenylamine.

Summary Intake Factor, cancer:	2.3E-2
Summary Intake Factor, noncancer:	6.8E-2

Source: Ecology and Environment, Inc. 1994

Table S.B-57
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Adult Residential Average Scenario: Dermal Contact with Ground Water (Deep Wells)

Exposure Equation:

$$DAD = \frac{CW \times PC \times SA \times ET \times EF \times ED \times CF \times FC}{BW \times AT}$$

DAD: dermally absorbed dose	EF: exposure frequency
CW: chemical conc. in water	FC: fraction contacted
PC: permeability constant	CF: conversion factor
SA: skin surface area	BW: body weight
ET: exposure time	AT: averaging time
ED: exposure duration	

Exposure Factors:

CW*	--	(mg/L)
PC*	--	(cm/hour)
SA	20,000	(cm^2)
ET	0.17	(hour/day)
EF	350	(day/year)
ED	9	(years)
FC	1	(unitless)
CF	0.001	(L/cm^3)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/L)	Kp (cm/hr)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
ALUMINUM	7.65E-1	1.0E-3	4.6E-6	NA	NA	3.6E-5	NA	NA
CALCIUM	1.46E+2	1.0E-3	8.7E-4	NA	NA	6.8E-3	NA	NA
POTASSIUM	9.70E+1	1.0E-3	5.8E-4	NA	NA	4.5E-3	NA	NA
SELENIUM	1.05E-1	1.0E-3	6.3E-7	NA	NA	4.9E-6	5.00E-3	9.73E-4
VANADIUM	1.90E-2	1.0E-3	1.1E-7	NA	NA	8.8E-7	7.00E-3	1.26E-4
ZINC	7.44E-2	1.0E-3	4.5E-7	NA	NA	3.5E-6	NA	NA
2-METHYLPHENOL	1.85E-2	NA	NA	NA	NA	NA	5.00E-2	NA
4,4'-DDD	2.43E-4	2.8E-1	4.1E-7	0.24	9.8E-8	3.2E-6	NA	NA
4,4'-DDT	3.28E-4	4.3E-1	8.4E-7	0.34	2.9E-7	6.6E-6	5.00E-4	1.31E-2
4-METHYLPHENOL	3.00E-3	NA	NA	NA	NA	NA	5.00E-3	NA
ACETONE	1.65E-2	NA	NA	NA	NA	NA	1.00E-1	NA
DI-N-OCTYLPHTHALATE	7.00E-3	NA	NA	NA	NA	NA	2.00E-2	NA
DIETHYLPHTHALATE	3.50E-3	NA	NA	NA	NA	NA	8.00E-1	NA
DIMETHYLPHTHALATE	1.70E-2	NA	NA	NA	NA	NA	1.00E+1	NA
N-NITROSODIPHENYLAMIN	6.00E-3	3.60E-02 (a)	1.3E-6	0.0049	6.3E-9	1.0E-5	NA	NA
NAPTHALENE	3.00E-3	6.9E-2	1.2E-6	NA	NA	9.6E-6	4.00E-2	2.41E-4
PHENOL	3.10E-2	5.5E-3	1.0E-6	NA	NA	7.9E-6	6.00E-1	1.32E-5
TOTAL					3.91E-7			0.014

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncarcer)
NA : Toxicity criterion not available.
(a) p-Nitrosodiphenyl amine Kp value used to approximate N-nitrosodiphenylamine.

Source: Ecology and Environment, Inc. 1994

Summary Intake Factor, cancer: 6.0E-3
Summary Intake Factor, noncancer: 4.7E-2

Table S.B-58

HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE

Future RME Worker Scenario - Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times FI \times ED \times EF}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	BW: body weight
ED: exposure duration	AT: averaging time
EF: exposure frequency	
FI: fraction ingested	

Exposure Factors:

CS*	–	(mg/kg)
IR	50	(mg/day)
ED	25	(years)
EF	250	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	9,125	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	1.9E-3	NA	NA	5.4E-3	NA	NA
Antimony	2.10E+1	3.7E-6	NA	NA	1.0E-5	4.00E-4	2.56E-2
Arsenic	3.75E+1	6.6E-6	1.75E+0	1.1E-5	1.8E-5	3.00E-4	6.12E-2
Barium	9.37E+2	1.6E-4	NA	NA	4.6E-4	7.00E-2	6.55E-3
Beryllium	4.18E-1	7.3E-8	4.30E+0	3.1E-7	2.0E-7	5.00E-3	4.09E-5
Cadmium	1.41E+1	2.5E-6	NA	NA	6.9E-6	5.00E-4	1.38E-2
Cobalt	1.75E+1	3.1E-6	NA	NA	8.6E-6	6.00E-2	1.43E-4
Copper	2.04E+3	3.6E-4	NA	NA	1.0E-3	3.70E-2	2.70E-2
Cyanide	1.75E+0	3.1E-7	NA	NA	8.6E-7	2.00E-2	4.28E-5
Iron	1.54E+5	2.7E-2	NA	NA	7.5E-2	NA	NA
Mercury	1.96E+0	3.4E-7	NA	NA	9.6E-7	3.00E-4	3.20E-3
Nickel	7.82E+1	1.4E-5	NA	NA	3.8E-5	2.00E-2	1.91E-3
Silver	1.46E+1	2.6E-6	NA	NA	7.2E-6	5.00E-3	1.43E-3
Thallium	1.02E+0	1.8E-7	NA	NA	5.0E-7	NA	NA
Vanadium	3.02E+1	5.3E-6	NA	NA	1.5E-5	7.00E-3	2.11E-3
1,1,1-TRICHLOROETHANE	6.21E-3	1.1E-9	NA	NA	3.0E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1.1E-9	6.00E-1	6.8E-10	3.2E-9	9.00E-3	3.53E-7
2-METHYLNAPHTHALENE	2.15E-1	3.7E-8	NA	NA	1.0E-7	NA	NA
4,4'-DDD	7.03E-2	1.2E-8	2.40E-1	2.9E-9	3.4E-8	NA	NA
4,4'-DDE	1.50E-1	2.6E-8	3.40E-1	8.9E-9	7.3E-8	NA	NA
4,4'-DDT	2.25E-1	3.9E-8	3.40E-1	1.3E-8	1.1E-7	5.00E-4	2.21E-4
ACENAPHTHENE	2.42E-1	4.2E-8	NA	NA	1.2E-7	6.00E-2	1.98E-6
ACENAPHTHYLENE	2.27E-1	4.0E-8	NA	NA	1.1E-7	NA	NA
ACETONE	1.12E-2	1.9E-9	NA	NA	5.5E-9	1.00E-1	5.46E-8
ALDRIN	3.42E-3	6.0E-10	1.70E+1	1.0E-8	1.7E-9	3.00E-5	5.57E-5
ALPHA-CHLORDANE	4.11E-2	7.2E-9	NA	NA	2.0E-8	NA	NA
ANTHRACENE	3.37E-1	5.9E-8	NA	NA	1.6E-7	3.00E-1	5.50E-7
AROCLOR-1254	9.91E-2	1.7E-8	NA	NA	4.8E-8	NA	NA
AROCLOR-1260	1.11E-1	1.9E-8	NA	NA	5.4E-8	NA	NA
BENZO(a)ANTHRACENE	1.82E+0	3.2E-7	7.30E-1 (*)	2.3E-7	8.9E-7	NA	NA
BENZO(a)PYRENE	1.56E+0	2.7E-7	7.30E+0	2.0E-6	7.6E-7	NA	NA
BENZO(b)FLUORANTHENE	2.07E+0	3.6E-7	7.30E-1 (*)	2.6E-7	1.0E-6	NA	NA
BENZO(g,h,i)PERYLENE	1.13E+0	2.0E-7	NA	NA	5.5E-7	NA	NA
BENZO(k)FLUORANTHENE	1.19E+0	2.1E-7	7.30E-2 (*)	1.5E-8	5.8E-7	NA	NA
beta-BHC	2.61E-3	4.6E-10	NA	NA	1.3E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	3.93E-1	6.9E-8	1.40E-2	9.6E-10	1.9E-7	2.00E-2	9.61E-6
BUTYLBENZYLPHTHALATE	2.76E-1	4.8E-8	NA	NA	1.4E-7	2.00E-1	6.76E-7
CARBAZOLE	2.40E-1	4.2E-8	2.00E-2	8.4E-10	1.2E-7	NA	NA
CHRYSENE	1.99E+0	3.5E-7	7.30E-3 (*)	2.5E-9	9.7E-7	NA	NA
delta-BHC	2.21E-3	3.9E-10	NA	NA	1.1E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	4.5E-8	NA	NA	1.2E-7	1.00E-1	1.25E-6
DI-N-OCTYLPHTHALATE	2.50E-1	4.4E-8	NA	NA	1.2E-7	2.00E-2	6.11E-6
DIBENZ(a,h)ANTHRACENE	3.13E-1	5.5E-8	7.30E+0	4.0E-7	1.5E-7	NA	NA
DIBENZOFURAN	2.36E-1	4.1E-8	NA	NA	1.2E-7	4.00E-3	2.89E-5
DIELDRIN	1.90E-2	3.3E-9	1.60E+1	5.3E-8	9.3E-9	5.00E-5	1.86E-4
DIETHYLPHTHALATE	2.43E-1	4.3E-8	NA	NA	1.2E-7	8.00E-1	1.49E-7
ENDOSULFAN-II	1.19E-2	2.1E-9	NA	NA	5.8E-9	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	9.7E-10	NA	NA	2.7E-9	NA	NA
ENDRIN	1.88E-2	3.3E-9	NA	NA	9.2E-9	3.00E-4	3.07E-5
ENDRIN-ALDEHYDE	3.14E-2	5.5E-9	NA	NA	1.5E-8	NA	NA
ENDRIN-KETONE	8.37E-3	1.5E-9	NA	NA	4.1E-9	NA	NA
FLUORANTHENE	2.87E+0	5.0E-7	NA	NA	1.4E-6	4.00E-2	3.51E-5
FLUORENE	2.42E-1	4.2E-8	NA	NA	1.2E-7	4.00E-2	2.96E-6
gama-BHC	2.11E-3	3.7E-10	NA	NA	1.0E-9	NA	NA
GAMMA-CHLORDANE	3.11E-2	5.4E-9	NA	NA	1.5E-8	NA	NA
HEPTACHLOR	2.89E-3	5.0E-10	4.50E+0	2.3E-9	1.4E-9	5.00E-4	2.82E-6
HEPTACHLOR-EPOXIDE	4.45E-3	7.8E-10	9.10E+0	7.1E-9	2.2E-9	1.30E-5	1.68E-4
INDENO(1,2,3-cd)PYRENE	9.35E-1	1.6E-7	7.30E-1 (*)	1.2E-7	4.6E-7	NA	NA
METHOXYCHLOR	2.95E-2	5.1E-9	NA	NA	1.4E-8	5.00E-3	2.88E-6
METHYLENE-CHLORIDE	1.29E-2	2.3E-9	7.50E-3	1.7E-11	6.3E-9	6.00E-2	1.05E-7
NAPTHALENE	2.13E-1	3.7E-8	NA	NA	1.0E-7	4.00E-2	2.61E-6
PHENANTHRENE	1.18E+0	2.1E-7	NA	NA	5.8E-7	NA	NA
PYRENE	2.60E+0	4.9E-7	NA	NA	1.4E-6	3.00E-2	4.57E-5
TETRACHLOROETHENE	6.85E-3	1.2E-9	5.20E-2	6.2E-11	3.4E-9	1.00E-2	3.35E-7
TOLUENE	8.03E-3	1.4E-9	NA	NA	3.9E-9	2.00E-1	1.97E-8
XYLENE	6.81E-3	1.2E-9	NA	NA	3.3E-9	2.00E+0	1.66E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	4.3E-11	1.50E+5	6.5E-6	1.2E-10	NA	NA
TOTAL				**2.14E-5**			**1.44E-1**

Summary Intake Factor, cancer:	1.7E-7
Summary Intake Factor, noncancer:	4.9E-7

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Source: Ecology and Environment, Inc. 1994

Table S.B-59
AGRICULTURAL LANDFILL SITE: HUMAN HEALTH RISK ASSESSMENT
Future Average Worker Scenario - Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times FI \times ED \times EF}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	BW: body weight
ED: exposure duration	AT: averaging time
EF: exposure frequency	
FI: fraction ingested	

Exposure Factors:

CS*	–	(mg/kg)
IR	50	(mg/day)
ED	9	(years)
EF	40	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	ancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	1.1E-4	NA	NA	8.6E-4	NA	NA
Antimony	2.10E+1	2.1E-7	NA	NA	1.6E-6	4.00E-4	4.10E-3
Arsenic	3.75E+1	3.8E-7	1.75E+0	6.6E-7	2.9E-6	3.00E-4	9.79E-3
Barium	9.37E+2	9.4E-6	NA	NA	7.3E-5	7.00E-2	1.05E-3
Beryllium	4.18E-1	4.2E-9	4.30E+0	1.8E-8	3.3E-8	5.00E-3	6.55E-6
Cadmium	1.41E+1	1.4E-7	NA	NA	1.1E-6	5.00E-4	2.20E-3
Cobalt	1.75E+1	1.8E-7	NA	NA	1.4E-6	6.00E-2	2.29E-5
Copper	2.04E+3	2.1E-5	NA	NA	1.6E-4	3.70E-2	4.32E-3
Cyanide	1.75E+0	1.8E-8	NA	NA	1.4E-7	2.00E-2	6.85E-6
Iron	1.54E+5	1.6E-3	NA	NA	1.2E-2	NA	NA
Mercury	1.96E+0	2.0E-8	NA	NA	1.5E-7	3.00E-4	5.12E-4
Nickel	7.82E+1	7.9E-7	NA	NA	6.1E-6	2.00E-2	3.06E-4
Silver	1.46E+1	1.5E-7	NA	NA	1.1E-6	5.00E-3	2.29E-4
Thallium	1.02E+0	1.0E-8	NA	NA	8.0E-8	NA	NA
Vanadium	3.02E+1	3.0E-7	NA	NA	2.4E-6	7.00E-3	3.38E-4
1,1,1-TRICHLOROETHANE	6.21E-3	6.2E-11	NA	NA	4.9E-10	NA	NA
1,1-DICHLOROETHENE	6.50E-3	6.5E-11	6.00E-1	3.9E-11	5.1E-10	9.00E-3	5.65E-8
2-METHYLNAPHTHALENE	2.15E-1	2.2E-9	NA	NA	1.7E-8	NA	NA
4,4'-DDD	7.03E-2	7.1E-10	2.40E-1	1.7E-10	5.5E-9	NA	NA
4,4'-DDE	1.50E-1	1.5E-9	3.40E-1	5.1E-10	1.2E-8	NA	NA
4,4'-DDT	2.25E-1	2.3E-9	3.40E-1	7.7E-10	1.8E-8	5.00E-4	3.53E-5
ACENAPHTHENE	2.42E-1	2.4E-9	NA	NA	1.9E-8	6.00E-2	3.16E-7
ACENAPHTHYLENE	2.27E-1	2.3E-9	NA	NA	1.8E-8	NA	NA
ACETONE	1.12E-2	1.1E-10	NA	NA	8.7E-10	1.00E-1	8.73E-9
ALDRIN	3.42E-3	3.4E-11	1.70E+1	5.8E-10	2.7E-10	3.00E-5	8.92E-6
ALPHA-CHLORDANE	4.11E-2	4.1E-10	NA	NA	3.2E-9	NA	NA
ANTHRACENE	3.37E-1	3.4E-9	NA	NA	2.6E-8	3.00E-1	8.79E-8
AROCLOR-1254	9.91E-2	1.0E-9	NA	NA	7.8E-9	NA	NA
AROCLOR-1260	1.11E-1	1.1E-9	NA	NA	8.7E-9	NA	NA
BENZO(a)ANTHRACENE	1.82E+0	1.8E-8	7.30E-1 (*)	1.3E-8	1.4E-7	NA	NA
BENZO(a)PYRENE	1.56E+0	1.6E-8	7.30E+0	1.1E-7	1.2E-7	NA	NA
BENZO(b)FLUORANTHENE	2.07E+0	2.1E-8	7.30E-1 (*)	1.5E-8	1.6E-7	NA	NA
BENZO(g,h,i)PERYLENE	1.13E+0	1.1E-8	NA	NA	8.8E-8	NA	NA
BENZO(k)FLUORANTHENE	1.19E+0	1.2E-8	7.30E-2 (*)	8.7E-10	9.3E-8	NA	NA
beta-BHC	2.61E-3	2.6E-11	NA	NA	2.0E-10	NA	NA
bis(2-ETHYLHEXYL)PHTHALAT	3.93E-1	4.0E-9	1.40E-2	5.5E-11	3.1E-8	2.00E-2	1.54E-6
BUTYLBENZYLPHTHALATE	2.76E-1	2.8E-9	NA	NA	2.2E-8	2.00E-1	1.08E-7
CARBAZOLE	2.40E-1	2.4E-9	2.00E-2	4.8E-11	1.9E-8	NA	NA
CHRYSENE	1.99E+0	2.0E-8	7.30E-3	1.5E-10	1.6E-7	NA	NA
delta-BHC	2.21E-3	2.2E-11	NA	NA	1.7E-10	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	2.6E-9	NA	NA	2.0E-8	1.00E-1	2.00E-7
DI-N-OCTYLPHTHALATE	2.50E-1	2.5E-9	NA	NA	2.0E-8	2.00E-2	9.78E-7
DIBENZ(a,h)ANTHRACENE	3.13E-1	3.1E-9	7.30E+0 (*)	2.3E-8	2.4E-8	NA	NA
DIBENZOFURAN	2.36E-1	2.4E-9	NA	NA	1.8E-8	4.00E-3	4.62E-6
DIELDRIN	1.90E-2	1.9E-10	1.60E+1	3.1E-9	1.5E-9	5.00E-5	2.98E-5
DIETHYLPHTHALATE	2.43E-1	2.4E-9	NA	NA	1.9E-8	8.00E-1	2.38E-8
ENDOSULFAN-II	1.19E-2	1.2E-10	NA	NA	9.3E-10	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	5.6E-11	NA	NA	4.3E-10	NA	NA
ENDRIN	1.88E-2	1.9E-10	NA	NA	1.5E-9	3.00E-4	4.91E-6
ENDRIN-ALDEHYDE	3.14E-2	3.2E-10	NA	NA	2.5E-9	NA	NA
ENDRIN-KETONE	8.37E-3	8.4E-11	NA	NA	6.6E-10	NA	NA
FLUORANTHENE	2.87E+0	2.9E-8	NA	NA	2.2E-7	4.00E-2	5.62E-6
FLUORENE	2.42E-1	2.4E-9	NA	NA	1.9E-8	4.00E-2	4.73E-7
gama-BHC	2.11E-3	2.1E-11	NA	NA	1.7E-10	NA	NA
GAMMA-CHLORDANE	3.11E-2	3.1E-10	NA	NA	2.4E-9	NA	NA
HEPTACHLOR	2.89E-3	2.9E-11	4.50E+0	1.3E-10	2.3E-10	5.00E-4	4.52E-7
HEPTACHLOR-EPOXIDE	4.45E-3	4.5E-11	9.10E+0	4.1E-10	3.5E-10	1.30E-5	2.68E-5
INDENO(1,2,3-cd)PYRENE	9.35E-1	9.4E-9	7.30E-1 (*)	6.9E-9	7.3E-8	NA	NA
METHOXYCHLOR	2.95E-2	3.0E-10	NA	NA	2.3E-9	5.00E-3	4.61E-7
METHYLENE-CHLORIDE	1.29E-2	1.3E-10	7.50E-3	9.7E-13	1.0E-9	6.00E-2	1.68E-8
NAPTHALENE	2.13E-1	2.1E-9	NA	NA	1.7E-8	4.00E-2	4.17E-7
PHENANTHRENE	1.18E+0	1.2E-8	NA	NA	9.2E-8	NA	NA
PYRENE	2.80E+0	2.8E-8	NA	NA	2.2E-7	3.00E-2	7.30E-6
TETRACHLOROETHENE	6.85E-3	6.9E-11	5.20E-2	3.6E-12	5.4E-10	1.00E-2	5.36E-8
TOLUENE	8.03E-3	8.1E-11	NA	NA	6.3E-10	2.00E-1	3.14E-9
XYLENE	6.81E-3	6.8E-11	NA	NA	5.3E-10	2.00E+0	2.66E-10
2,3,7,8-TCDD (Equiv)	2.48E-4	2.5E-12	1.50E+5	3.7E-7	1.9E-11	NA	NA
TOTAL				1.23E-6			2.30E-2

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.7E-7
Summary Intake Factor, noncancer: 4.9E-7

Source: Ecology and Environment, Inc. 1994

Table S.B-60
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future RME Industrial Scenario - Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	CS: contaminant conc. in soil
ED: exposure duration	AF: adherence factor
EF: exposure frequency	ABS: absorption factor
CF: conversion factor	BW: body weight
	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	--	(unitless)
ED	25	(years)
EF	250	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	9,125	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	Carcinogenic Effects: LADI (mg/kg-day)	Carcinogenic Effects: Dermal SF $(mg/kg\text{-}day)^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: CDI (mg/kg-day)	Noncarcinogenic Effects: Dermal RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
Aluminum	1.10E+4	0.1%	1.9E-4	NA	NA	5.4E-4	NA	NA
Antimony	2.10E+1	0.1%	3.7E-7	NA	NA	1.0E-6	2.00E-5 (b)	5.1E-2
Arsenic	3.75E+1	0.1%	6.6E-7	3.50E+1 (a)	2.3E-5	1.8E-6	1.50E-5 (b)	1.2E-1
Barium	9.37E+2	0.1%	1.6E-5	NA	NA	4.6E-5	3.50E-3 (b)	1.3E-2
Beryllium	4.18E-1	0.1%	7.3E-9	8.60E+1 (a)	6.3E-7	2.0E-8	2.50E-4 (b)	8.2E-5
Cadmium	1.41E+1	0.1%	2.5E-7	NA	NA	6.9E-7	2.50E-5 (b)	2.8E-2
Cobalt	1.75E+1	0.1%	3.1E-7	NA	NA	8.6E-7	NA	NA
Cyanide	1.75E+0	0.1%	3.1E-8	NA	NA	8.6E-8	1.00E-3 (b)	8.6E-5
Iron	1.54E+5	0.1%	2.7E-3	NA	NA	7.5E-3	NA	NA
Mercury	1.96E+0	0.1%	3.4E-8	NA	NA	9.6E-8	1.50E-5 (b)	6.4E-3
Nickel	7.82E+1	0.1%	1.4E-6	NA	NA	3.8E-6	1.00E-3 (b)	3.8E-3
Silver	1.46E+1	0.1%	2.6E-7	NA	NA	7.2E-7	2.50E-4 (b)	2.9E-3
Thallium	1.02E+0	0.1%	1.8E-8	NA	NA	5.0E-8	NA	NA
Vanadium	3.02E+1	0.1%	5.3E-7	NA	NA	1.5E-6	7.00E-3	2.1E-4
1,1,1-TRICHLOROETHANE	6.21E-3	1.0%	1.1E-9	NA	NA	3.0E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1.0%	1.1E-9	6.00E-1	6.8E-10	3.2E-9	9.00E-3	3.5E-7
2-METHYLNAPHTHALENE	2.15E-1	1.0%	3.7E-8	NA	NA	1.0E-7	NA	NA
4,4'-DDD	7.03E-2	1.0%	1.2E-8	2.40E-1	2.9E-9	3.4E-8	NA	NA
4,4'-DDE	1.50E-1	1.0%	2.6E-8	3.40E-1	8.9E-9	7.3E-8	NA	NA
4,4'-DDT	2.25E-1	1.0%	3.9E-8	3.40E-1	1.3E-8	1.1E-7	5.00E-4	2.2E-4
ACETONE	1.12E-2	1.0%	1.9E-9	NA	NA	5.5E-9	1.00E-1	5.5E-8
ALDRIN	3.42E-3	1.0%	6.0E-10	1.70E+1	1.0E-8	1.7E-9	3.00E-5	NA
ALPHA-CHLORDANE	4.11E-2	1.0%	7.2E-9	NA	NA	2.0E-8	NA	NA
AROCLOR-1254	9.91E-2	1.0%	1.7E-8	NA	NA	4.8E-8	NA	NA
AROCLOR-1260	1.11E-1	1.0%	1.9E-8	NA	NA	5.4E-8	NA	NA
beta-BHC	2.61E-3	1.0%	4.6E-10	NA	NA	1.3E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALAT	3.93E-1	1.0%	6.9E-8	1.40E-2	9.6E-10	1.9E-7	2.00E-2	9.6E-6
BUTYLBENZYLPHTHALATE	2.76E-1	1.0%	4.8E-8	NA	NA	1.4E-7	2.00E-1	6.8E-7
CARBAZOLE	2.40E-1	1.0%	4.2E-8	2.00E-2	8.4E-10	1.2E-7	NA	NA
delta-BHC	2.21E-3	1.0%	3.9E-10	NA	NA	1.1E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	1.0%	4.5E-8	NA	NA	1.2E-7	1.00E-1	1.2E-6
DI-N-OCTYLPHTHALATE	2.50E-1	1.0%	4.4E-8	NA	NA	1.2E-7	2.00E-2	6.1E-6
DIBENZOFURAN	2.36E-1	1.0%	4.1E-8	NA	NA	1.2E-7	4.00E-3	2.9E-5
DIELDRIN	1.90E-2	1.0%	3.3E-9	1.60E+1	5.3E-8	9.3E-9	5.00E-5	1.9E-4
DIETHYLPHTHALATE	2.43E-1	1.0%	4.3E-8	NA	NA	1.2E-7	8.00E-1	1.5E-7
ENDOSULFAN-II	1.19E-2	1.0%	2.1E-9	NA	NA	5.8E-9	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	1.0%	9.7E-10	NA	NA	2.7E-9	NA	NA
ENDRIN	1.88E-2	1.0%	3.3E-9	NA	NA	9.2E-9	3.00E-4	3.1E-5
ENDRIN-ALDEHYDE	3.14E-2	1.0%	5.5E-9	NA	NA	1.5E-8	NA	NA
ENDRIN-KETONE	8.37E-3	1.0%	1.5E-9	NA	NA	4.1E-9	NA	NA
FLUORANTHENE	2.87E+0	1.0%	5.0E-7	NA	NA	1.4E-6	4.00E-2	3.5E-5
gama-BHC	2.11E-3	1.0%	3.7E-10	NA	NA	1.0E-9	NA	NA
GAMMA-CHLORDANE	3.11E-2	1.0%	5.4E-9	NA	NA	1.5E-8	NA	NA
HEPTACHLOR	2.89E-3	1.0%	5.0E-10	NA	NA	1.4E-9	5.00E-4	2.8E-6
HEPTACHLOR-EPOXIDE	4.45E-3	1.0%	7.8E-10	9.10E+0	7.1E-9	2.2E-9	1.30E-5	1.7E-4
METHOXYCHLOR	2.95E-2	1.0%	5.1E-9	NA	NA	1.4E-8	5.00E-3	2.9E-6
METHYLENE-CHLORIDE	1.29E-2	1.0%	2.3E-9	7.50E-3	1.7E-11	6.3E-9	6.00E-2	1.1E-7
NAPTHALENE	2.13E-1	1.0%	3.7E-8	NA	NA	1.0E-7	4.00E-2	2.6E-6
TETRACHLOROETHENE	6.85E-3	1.0%	1.2E-9	5.20E-2	6.2E-11	3.4E-9	1.00E-2	3.4E-7
TOLUENE	8.03E-3	1.0%	1.4E-9	NA	NA	3.9E-9	2.00E-1	2.0E-8
XYLENE	6.81E-3	1.0%	1.2E-9	NA	NA	3.3E-9	2.00E+0	1.7E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	1.0%	4.3E-11	1.50E+5	6.5E-6	1.2E-10	NA	NA
TOTAL					3.02E-5			0.23

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 1.7E-5
Summary Intake Factor, noncancer: 4.9E-5

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Source: Ecology and Environment, Inc. 1994

Table S.B-61
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future Average Industrial Scenario - Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	CS: contaminant conc. in soil
	AF: adherence factor
ED: exposure duration	ABS: absorption factor
EF: exposure frequency	BW: body weight
CF: conversion factor	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
DA_{event}*	--	(mg/kg-day)
AF	0.2	(mg/cm^2-event)
ABS**	--	(unitless)
ED	9	(years)
EF	40	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	Carcinogenic Effects: LADI (mg/kg-day)	Carcinogenic Effects: Dermal SF $(mg/kg\text{-}day)^{-1}$	Carcinogenic Effects: Cancer Risk	Noncarcinogenic Effects: CDI (mg/kg-day)	Noncarcinogenic Effects: Dermal RfD (mg/kg-day)	Noncarcinogenic Effects: Hazard Quotient
Aluminum	1.10E+4	0.1%	2.2E-6	NA	NA	1.7E-5	NA	NA
Antimony	2.10E+1	0.1%	4.2E-9	NA	NA	3.3E-8	2.00E-5 (b)	1.6E-3
Arsenic	3.75E+1	0.1%	7.6E-9	3.50E+1 (a)	2.6E-7	5.9E-8	1.50E-5 (b)	3.9E-3
Barium	9.37E+2	0.1%	1.9E-7	NA	NA	1.5E-6	3.50E-3 (b)	4.2E-4
Beryllium	4.18E-1	0.1%	8.4E-11	8.60E+1 (a)	7.2E-9	6.5E-10	2.50E-4 (b)	2.6E-6
Cadmium	1.41E+1	0.1%	2.8E-9	NA	NA	2.2E-8	NA	NA
Cobalt	1.75E+1	0.1%	3.5E-9	NA	NA	2.7E-8	NA	NA
Cyanide	1.75E+0	0.1%	3.5E-10	NA	NA	2.7E-9	1.00E-3 (b)	2.7E-6
Iron	1.54E+5	0.1%	3.1E-5	NA	NA	2.4E-4	NA	NA
Mercury	1.96E+0	0.1%	3.9E-10	NA	NA	3.1E-9	1.50E-5 (b)	2.0E-4
Nickel	7.82E+1	0.1%	1.6E-8	NA	NA	1.2E-7	1.00E-3 (b)	1.2E-4
Silver	1.46E+1	0.1%	2.9E-9	NA	NA	2.3E-8	2.50E-4 (b)	9.2E-5
Thallium	1.02E+0	1.0%	2.0E-9	NA	NA	1.6E-8	NA	NA
Vanadium	3.02E+1	1.0%	6.1E-8	NA	NA	4.7E-7	7.00E-3	6.8E-5
1,1,1-TRICHLOROETHANE	6.21E-3	1.0%	1.2E-11	NA	NA	9.7E-11	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1.0%	1.3E-11	6.00E-1	7.8E-12	1.0E-10	9.00E-3	1.1E-8
2-METHYLNAPHTHALENE	2.15E-1	1.0%	4.3E-10	NA	NA	3.4E-9	NA	NA
4,4'-DDD	7.03E-2	1.0%	1.4E-10	2.40E-1	3.4E-11	1.1E-9	NA	NA
4,4'-DDE	1.50E-1	1.0%	3.0E-10	3.40E-1	1.0E-10	2.3E-9	NA	NA
4,4'-DDT	2.25E-1	1.0%	4.5E-10	3.40E-1	1.5E-10	3.5E-9	5.00E-4	7.1E-6
ACETONE	1.12E-2	1.0%	2.2E-11	NA	NA	1.7E-10	1.00E-1	1.7E-9
ALDRIN	3.42E-3	1.0%	6.9E-12	1.70E+1	1.2E-10	5.3E-11	3.00E-5	1.8E-6
ALPHA-CHLORDANE	4.11E-2	1.0%	8.3E-11	NA	NA	6.4E-10	NA	NA
AROCLOR-1254	9.91E-2	1.0%	2.0E-10	NA	NA	1.6E-9	NA	NA
AROCLOR-1260	1.11E-1	1.0%	2.2E-10	NA	NA	1.7E-9	NA	NA
beta-BHC	2.61E-3	1.0%	5.3E-12	NA	NA	4.1E-11	NA	NA
bis(2-ETHYLHEXYL)PHTHALATE	3.93E-1	1.0%	7.9E-10	1.40E-2	1.1E-11	6.2E-9	2.00E-2	3.1E-7
BUTYLBENZYLPHTHALATE	2.76E-1	1.0%	5.6E-10	NA	NA	4.3E-9	2.00E-1	2.2E-8
CARBAZOLE	2.40E-1	1.0%	4.8E-10	2.00E-2	9.7E-12	3.8E-9	NA	NA
delta-BHC	2.21E-3	1.0%	4.4E-12	NA	NA	3.5E-11	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	1.0%	5.1E-10	NA	NA	4.0E-9	1.00E-1	4.0E-8
DI-N-OCTYLPHTHALATE	2.50E-1	1.0%	5.0E-10	NA	NA	3.9E-9	2.00E-2	2.0E-7
DIBENZOFURAN	2.36E-1	1.0%	4.8E-10	NA	NA	3.7E-9	4.00E-3	9.2E-7
DIELDRIN	1.90E-2	1.0%	3.8E-11	1.60E+1	6.1E-10	3.0E-10	5.00E-5	6.0E-6
DIETHYLPHTHALATE	2.43E-1	1.0%	4.9E-10	NA	NA	3.8E-9	8.00E-1	4.8E-9
ENDOSULFAN-II	1.19E-2	1.0%	2.4E-11	NA	NA	1.9E-10	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	1.0%	1.1E-11	NA	NA	8.7E-11	NA	NA
ENDRIN	1.88E-2	1.0%	3.8E-11	NA	NA	2.9E-10	3.00E-4	9.8E-7
ENDRIN-ALDEHYDE	3.14E-2	1.0%	6.3E-11	NA	NA	4.9E-10	NA	NA
ENDRIN-KETONE	8.37E-3	1.0%	1.7E-11	NA	NA	1.3E-10	NA	NA
FLUORANTHENE	2.87E+0	1.0%	5.8E-9	NA	NA	4.5E-8	4.00E-2	1.1E-6
gama-BHC	2.11E-3	1.0%	4.3E-12	NA	NA	3.3E-11	NA	NA
GAMMA-CHLORDANE	3.11E-2	1.0%	6.3E-11	NA	NA	4.9E-10	NA	NA
HEPTACHLOR	2.89E-3	1.0%	5.8E-12	NA	NA	4.5E-11	5.00E-4	9.0E-8
HEPTACHLOR-EPOXIDE	4.45E-3	1.0%	9.0E-12	9.10E+0	8.2E-11	7.0E-11	1.30E-5	5.4E-6
METHOXYCHLOR	2.95E-2	1.0%	5.9E-11	NA	NA	4.6E-10	5.00E-3	9.2E-8
METHYLENE-CHLORIDE	1.29E-2	1.0%	2.6E-11	7.50E-3	1.9E-13	2.0E-10	6.00E-2	3.4E-9
NAPTHALENE	2.13E-1	1.0%	4.3E-10	NA	NA	3.3E-9	4.00E-2	8.3E-8
TETRACHLOROETHENE	6.85E-3	1.0%	1.4E-11	5.20E-2	7.2E-13	1.1E-10	1.00E-2	1.1E-8
TOLUENE	8.03E-3	1.0%	1.6E-11	NA	NA	1.3E-10	2.00E-1	6.3E-10
XYLENE	6.81E-3	1.0%	1.4E-11	NA	NA	1.1E-10	2.00E+0	5.3E-11
2,3,7,8-TCDD (Equiv)	2.48E-4	1.0%	5.0E-13	1.50E+5	7.5E-8	3.9E-12	NA	NA
TOTAL					3.48E-7			0.006

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 2.0E-7
Summary Intake Factor, noncancer: 1.6E-6

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Source: Ecology and Environment, Inc. 1994

Table S.B-62
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future RME Industrial Scenario - Inhalation of Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CS: chemical conc. in air	ED: exposure duration
IR: inhalation rate	BW: body weight
EF: exposure frequency	FI: fraction inhaled
AT: averaging time	

Exposure Factors:

CS*	--	(mg/kg)
IR	20	(m^3/day)
ED	25	(years)
EF	250	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	9,125	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,2,4-TRIMETHYLBENZE	1.38E-3	9.6E-5	NA	NA	2.7E-4	NA	NA
BENZENE	4.28E-3	3.0E-4	2.90E-2	8.7E-6	8.4E-4	NA	NA
CHLOROMETHANE	8.90E-4	6.2E-5	6.30E-3	3.9E-7	1.7E-4	NA	NA
ETHYLBENZENE	9.81E-4	6.9E-5	NA	NA	1.9E-4	2.85E-1	6.7E-4
FREON 11	1.94E-3	1.4E-4	NA	NA	3.8E-4	NA	NA
FREON 12	2.81E-3	2.0E-4	NA	NA	5.5E-4	NA	NA
M,P-XYLENE	3.03E-3	2.1E-4	NA	NA	5.9E-4	NA	NA
O-XYLENE	1.09E-3	7.6E-5	NA	NA	2.1E-4	NA	NA
TOLUENE	4.92E-3	3.4E-4	NA	NA	9.6E-4	1.10E-1	8.8E-3
TOTAL				**9.07E-6**			**0.0094319**

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA - Toxicity criteria not available.

Summary Intake Factor, cancer: 7.0E-2
Summary Intake Factor, noncancer: 2.0E-1

Source: Ecology and Environment, Inc. 1994

Table S.B-63
AGRICULTURE LANDFILL SITE: HUMAN HEALTH RISK ASSESSMENT
Future Average Industrial Scenario - Inhalation of Vapors

Exposure Equation:

$$\text{Intake} = \frac{CA \times IR \times EF \times ED \times FI}{BW \times AT}$$

where,

CS: chemical conc. in air	ED: exposure duration
IR: inhalation rate	BW: body weight
EF: exposure frequency	FI: fraction inhaled
AT: averaging time	

Exposure Factors

CS*	--	(mg/kg)
IR	20	(m^3/day)
ED	9	(years)
EF	250	(days/year)
FI	1	(unitless)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,285	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Air Concentration (mg/m^3)	LADI (mg/kg-day)	Inhalation SF $(mg/kg\text{-day})^{-1}$	Cancer Risk	CDI (mg/kg-day)	Inhalation RfD (mg/kg-day)	Hazard Quotient
1,2,4-TRIMETHYLBENZEN	1.38E-3	3.5E-5	NA	NA	2.7E-4	NA	NA
BENZENE	4.28E-3	1.1E-4	2.90E-2	3.1E-6	8.4E-4	NA	NA
CHLOROMETHANE	8.90E-4	2.2E-5	6.30E-3	1.4E-7	1.7E-4	NA	NA
ETHYLBENZENE	9.81E-4	2.5E-5	NA	NA	1.9E-4	2.85E-1	6.7E-4
FREON 11	1.94E-3	4.9E-5	NA	NA	3.8E-4	NA	NA
FREON 12	2.81E-3	7.1E-5	NA	NA	5.5E-4	NA	NA
M,P-XYLENE	3.03E-3	7.6E-5	NA	NA	5.9E-4	NA	NA
O-XYLENE	1.09E-3	2.7E-5	NA	NA	2.1E-4	NA	NA
TOLUENE	4.92E-3	1.2E-4	NA	NA	9.6E-4	1.10E-1	8.8E-3
TOTAL				3.27E-6			0.0094319

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA - Toxicity criteria not available.

Source: Ecology and Environment, Inc. 1994

Summary Intake Factor, cancer:	2.5E-2
Summary Intake Factor, noncancer:	2.0E-1

Table S.B-64
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future RME Trespasser Scenario - Incidental Ingestion of Soil

Exposure Equation:

$$\text{Intake} = \frac{CS \times IR \times CF \times ED \times EF \times FI}{BW \times AT}$$

CS: chemical conc. in soil	CF: conversion factor
IR: ingestion rate	FI: fraction ingested
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time

Exposure Factors:

CS*	--	(mg/kg)
IR	100	(mg/day)
ED	10	(years)
EF	180	(days/year)
FI	1	(unitless)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,650	(days) noncancer

* - Chemical specific value

		Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	LADI (mg/kg-day)	Oral SF (mg/kg-day)$^{-1}$	Cancer Risk	CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	1.1E-3	NA	NA	7.7E-3	NA	NA
Antimony	2.10E+1	2.1E-6	NA	NA	1.5E-5	4.00E-4	3.69E-2
Arsenic	3.75E+1	3.8E-6	1.75E+0	6.6E-6	2.6E-5	3.00E-4	8.81E-2
Barium	9.37E+2	9.4E-5	NA	NA	6.6E-4	7.00E-2	9.43E-3
Beryllium	4.18E-1	4.2E-8	4.30E+0	1.8E-7	2.9E-7	5.00E-3	5.89E-5
Cadmium	1.41E+1	1.4E-6	NA	NA	9.9E-6	5.00E-4	1.98E-2
Cobalt	1.75E+1	1.8E-6	NA	NA	1.2E-5	6.00E-2	2.06E-4
Copper	2.04E+3	2.1E-4	NA	NA	1.4E-3	3.70E-2	3.89E-2
Cyanide	1.75E+0	1.8E-7	NA	NA	1.2E-6	2.00E-2	6.17E-5
Iron	1.54E+5	1.6E-2	NA	NA	1.1E-1	NA	NA
Mercury	1.96E+0	2.0E-7	NA	NA	1.4E-6	3.00E-4	4.61E-3
Nickel	7.82E+1	7.9E-6	NA	NA	5.5E-5	2.00E-2	2.75E-3
Silver	1.46E+1	1.5E-6	NA	NA	1.0E-5	5.00E-3	2.06E-3
Thallium	1.02E+0	1.0E-7	NA	NA	7.2E-7	NA	NA
Vanadium	3.02E+1	3.0E-6	NA	NA	2.1E-5	7.00E-3	3.04E-3
1,1,1-TRICHLOROETHANE	6.21E-3	6.2E-10	NA	NA	4.4E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	6.5E-10	6.00E-1	3.9E-10	4.6E-9	9.00E-3	5.09E-7
2-METHYLNAPHTHALENE	2.15E-1	2.2E-8	NA	NA	1.5E-7	NA	NA
4,4'-DDD	7.03E-2	7.1E-9	2.40E-1	1.7E-9	4.9E-8	NA	NA
4,4'-DDE	1.50E-1	1.5E-8	3.40E-1	5.1E-9	1.1E-7	NA	NA
4,4'-DDT	2.25E-1	2.3E-8	3.40E-1	7.7E-9	1.6E-7	5.00E-4	3.18E-4
ACENAPHTHENE	2.42E-1	2.4E-8	NA	NA	1.7E-7	6.00E-2	2.84E-6
ACENAPHTHYLENE	2.27E-1	2.3E-8	NA	NA	1.6E-7	NA	NA
ACETONE	1.12E-2	1.1E-9	NA	NA	7.9E-9	1.00E-1	7.86E-8
ALDRIN	3.42E-3	3.4E-10	1.70E+1	5.8E-9	2.4E-9	3.00E-5	8.02E-5
ALPHA-CHLORDANE	4.11E-2	4.1E-9	NA	NA	2.9E-8	NA	NA
ANTHRACENE	3.37E-1	3.4E-8	NA	NA	2.4E-7	3.00E-1	7.91E-7
AROCLOR-1254	9.91E-2	1.0E-8	NA	NA	7.0E-8	NA	NA
AROCLOR-1260	1.11E-1	1.1E-8	NA	NA	7.8E-8	NA	NA
BENZO(a)ANTHRACENE	1.82E+0	1.8E-7	7.30E-1 (*)	1.3E-7	1.3E-6	NA	NA
BENZO(a)PYRENE	1.56E+0	1.6E-7	7.30E+0	1.1E-6	1.1E-6	NA	NA
BENZO(b)FLUORANTHENE	2.07E+0	2.1E-7	7.30E-1 (*)	1.5E-7	1.5E-6	NA	NA
BENZO(g,h,i)PERYLENE	1.13E+0	1.1E-7	NA	NA	8.0E-7	NA	NA
BENZO(k)FLUORANTHENE	1.19E+0	1.2E-7	7.30E-2 (*)	8.7E-9	8.4E-7	NA	NA
beta-BHC	2.61E-3	2.6E-10	NA	NA	1.8E-9	NA	NA
bis(2-ETHYLHEXYL)PHTHALAT	3.93E-1	4.0E-8	1.40E-2	5.5E-10	2.8E-7	2.00E-2	1.38E-5
BUTYLBENZYLPHTHALATE	2.76E-1	2.8E-8	NA	NA	1.9E-7	2.00E-1	9.74E-7
CARBAZOLE	2.40E-1	2.4E-8	2.00E-2	4.8E-10	1.7E-7	NA	NA
CHRYSENE	1.99E+0	2.0E-7	7.30E-3 (*)	1.5E-9	1.4E-6	NA	NA
delta-BHC	2.21E-3	2.2E-10	NA	NA	1.6E-9	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	2.6E-8	NA	NA	1.8E-7	1.00E-1	1.80E-6
DI-N-OCTYLPHTHALATE	2.50E-1	2.5E-8	NA	NA	1.8E-7	2.00E-2	8.80E-6
DIBENZ(a,h)ANTHRACENE	3.13E-1	3.1E-8	7.30E+0 (*)	2.3E-7	2.2E-7	NA	NA
DIBENZOFURAN	2.36E-1	2.4E-8	NA	NA	1.7E-7	4.00E-3	4.16E-5
DIELDRIN	1.90E-2	1.9E-9	1.60E+1	3.1E-8	1.3E-8	5.00E-5	2.68E-4
DIETHYLPHTHALATE	2.43E-1	2.4E-8	NA	NA	1.7E-7	8.00E-1	2.14E-7
ENDOSULFAN-II	1.19E-2	1.2E-9	NA	NA	8.4E-9	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	5.6E-10	NA	NA	3.9E-9	NA	NA
ENDRIN	1.88E-2	1.9E-9	NA	NA	1.3E-8	3.00E-4	4.42E-5
ENDRIN-ALDEHYDE	3.14E-2	3.2E-9	NA	NA	2.2E-8	NA	NA
ENDRIN-KETONE	8.37E-3	8.4E-10	NA	NA	5.9E-9	NA	NA
FLUORANTHENE	2.87E+0	2.9E-7	NA	NA	2.0E-6	4.00E-2	5.06E-5
FLUORENE	2.42E-1	2.4E-8	NA	NA	1.7E-7	4.00E-2	4.26E-6
gama-BHC	2.11E-3	2.1E-10	NA	NA	1.5E-9	NA	NA
GAMMA-CHLORDANE	3.11E-2	3.1E-9	NA	NA	2.2E-8	NA	NA
HEPTACHLOR	2.89E-3	2.9E-10	4.50E+0	1.3E-9	2.0E-9	5.00E-4	4.07E-6
HEPTACHLOR-EPOXIDE	4.45E-3	4.5E-10	9.10E+0	4.1E-9	3.1E-9	1.30E-5	2.41E-4
INDENO(1,2,3-cd)PYRENE	9.35E-1	9.4E-8	7.30E-1 (*)	6.9E-8	6.6E-7	NA	NA
METHOXYCHLOR	2.95E-2	3.0E-9	NA	NA	2.1E-8	5.00E-3	4.15E-6
METHYLENE-CHLORIDE	1.29E-2	1.3E-9	7.50E-3	9.7E-12	9.1E-9	6.00E-2	1.51E-7
NAPTHALENE	2.13E-1	2.1E-8	NA	NA	1.5E-7	4.00E-2	3.76E-6
PHENANTHRENE	1.18E+0	1.2E-7	NA	NA	8.3E-7	NA	NA
PYRENE	2.80E+0	2.8E-7	NA	NA	2.0E-6	3.00E-2	6.57E-5
TETRACHLOROETHENE	6.85E-3	6.9E-10	5.20E-2	3.6E-11	4.8E-9	1.00E-2	4.83E-7
TOLUENE	8.03E-3	8.1E-10	NA	NA	5.7E-9	2.00E-1	2.83E-8
XYLENE	6.81E-3	6.8E-10	NA	NA	4.8E-9	2.00E+0	2.40E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	2.5E-11	1.50E+5	3.7E-6	1.7E-10	NA	NA
TOTAL				1.23E-5			0.21

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

(*) SF derived using relative potencies (EPA 1993a)

Summary Intake Factor, cancer: 1.0E-7
Summary Intake Factor, noncancer: 7.0E-7

Source: Ecology and Environment, Inc. 1994

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Table S.B-65
HUMAN HEALTH RISK ASSESSMENT: AGRICULTURE STREET LANDFILL SITE
Future RME Trespasser Scenario - Dermal Contact with Soil

Exposure Equation:

$$DAD = \frac{DA_{event} \times EF \times ED \times SA \times CF}{BW \times AT}$$

and $DA_{event} = CS \times AF \times ABS$

DAD: dermally absorbed dose	SA: skin surface area
DA_{event}: dose absorbed per unit area per event	AF: adherence factor
	ABS: absorption factor
ED: exposure duration	BW: body weight
EF: exposure frequency	AT: averaging time
CS: chemical conc. in soil	CF: conversion factor

Exposure Factors:

CS*	–	(mg/kg)
DA_{event}*	–	(mg/kg-day)
AF	1	(mg/cm^2-event)
ABS**	–	(unitless)
ED	10	(years)
EF	180	(days/year)
SA	5000	(cm^2)
CF	1E-6	(kg/mg)
BW	70	(kg)
AT	25,550	(days) cancer
AT	3,650	(days) noncancer

* - Chemical specific value
** - 0.1% for metals; 1% for organics

			Carcinogenic Effects			Noncarcinogenic Effects		
Chemical	Exposure Point Concentration (mg/kg)	ABS (%)	LADI (mg/kg-day)	Dermal SF $(mg/kg\text{-}day)^{-1}$	Cancer Risk	CDI (mg/kg-day)	Dermal RfD (mg/kg-day)	Hazard Quotient
Aluminum	1.10E+4	0.1%	5.5E-5	NA	NA	3.9E-4	NA	NA
Antimony	2.10E+1	0.1%	1.1E-7	NA	NA	7.4E-7	2.00E-5 (b)	3.7E-2
Arsenic	3.75E+1	0.1%	1.9E-7	3.50E+1 (a)	6.6E-6	1.3E-6	1.50E-5 (b)	8.8E-2
Barium	9.37E+2	0.1%	4.7E-6	NA	NA	3.3E-5	3.50E-3 (b)	9.4E-3
Beryllium	4.18E-1	0.1%	2.1E-9	8.60E+1 (a)	1.8E-7	1.5E-8	2.50E-4 (b)	5.9E-5
Cadmium	1.41E+1	0.1%	7.1E-8	NA	NA	5.0E-7	NA	NA
Cobalt	1.75E+1	0.1%	8.8E-8	NA	NA	NA	3.00E-3 (b)	NA
Cyanide	1.75E+0	0.1%	8.8E-9	NA	NA	6.2E-8	1.00E-3 (b)	6.2E-5
Iron	1.54E+5	0.1%	7.8E-4	NA	NA	5.4E-3	NA	NA
Mercury	1.96E+0	0.1%	9.9E-9	NA	NA	6.9E-8	1.50E-5 (b)	4.6E-3
Nickel	7.82E+1	0.1%	3.9E-7	NA	NA	2.8E-6	1.00E-3 (b)	2.8E-3
Silver	1.46E+1	0.1%	7.4E-8	NA	NA	5.2E-7	2.50E-4 (b)	2.1E-3
Thallium	1.02E+0	0.1%	5.1E-9	NA	NA	3.6E-8	NA	NA
Vanadium	3.02E+1	0.1%	1.5E-7	NA	NA	1.1E-6	3.50E-4 (b)	3.0E-3
1,1,1-TRICHLOROETHANE	6.21E-3	1.0%	3.1E-10	NA	NA	2.2E-9	NA	NA
1,1-DICHLOROETHENE	6.50E-3	1.0%	3.3E-10	6.00E-1	2.0E-10	2.3E-9	9.00E-3	2.5E-7
2-METHYLNAPHTHALENE	2.15E-1	1.0%	1.1E-8	NA	NA	7.6E-8	NA	NA
4,4'-DDD	7.03E-2	1.0%	3.5E-9	2.40E-1	8.5E-10	2.5E-8	NA	NA
4,4'-DDE	1.50E-1	1.0%	7.5E-9	3.40E-1	2.6E-9	5.3E-8	NA	NA
4,4'-DDT	2.25E-1	1.0%	1.1E-8	3.40E-1	3.9E-9	7.9E-8	5.00E-4	1.6E-4
ACETONE	1.12E-2	1.0%	5.6E-10	NA	NA	3.9E-9	1.00E-1	3.9E-8
ALDRIN	3.42E-3	1.0%	1.7E-10	1.70E+1	2.9E-9	1.2E-9	3.00E-5	4.0E-5
ALPHA-CHLORDANE	4.11E-2	1.0%	2.1E-9	NA	NA	1.4E-8	NA	NA
ANTHRACENE	3.37E-1	1.0%	1.7E-8	NA	NA	1.2E-7	3.00E-1	4.0E-7
AROCLOR-1254	9.91E-2	1.0%	5.0E-9	NA	NA	3.5E-8	NA	NA
AROCLOR-1260	1.11E-1	1.0%	5.6E-9	NA	NA	3.9E-8	NA	NA
beta-BHC	2.61E-3	1.0%	1.3E-10	NA	NA	9.2E-10	NA	NA
bis(2-ETHYLHEXYL)PHTHAL	3.93E-1	1.0%	2.0E-8	1.40E-2	2.8E-10	1.4E-7	2.00E-2	6.9E-6
BUTYLBENZYLPHTHALATE	2.76E-1	1.0%	1.4E-8	NA	NA	9.7E-8	2.00E-1	4.9E-7
CARBAZOLE	2.40E-1	1.0%	1.2E-8	2.00E-2	2.4E-10	8.5E-8	NA	NA
delta-BHC	2.21E-3	1.0%	1.1E-10	NA	NA	7.8E-10	NA	NA
DI-N-BUTYLPHTHALATE	2.55E-1	1.0%	1.3E-8	NA	NA	9.0E-8	1.00E-1	9.0E-7
DI-N-OCTYLPHTHALATE	2.50E-1	1.0%	1.3E-8	NA	NA	8.8E-8	2.00E-2	4.4E-6
DIBENZOFURAN	2.36E-1	1.0%	1.2E-8	NA	NA	8.3E-8	4.00E-3	2.1E-5
DIELDRIN	1.90E-2	1.0%	9.6E-10	1.60E+1	1.5E-8	6.7E-9	5.00E-5	1.3E-4
DIETHYLPHTHALATE	2.43E-1	1.0%	1.2E-8	NA	NA	8.6E-8	8.00E-1	1.1E-7
ENDOSULFAN-II	1.19E-2	1.0%	6.0E-10	NA	NA	4.2E-9	NA	NA
ENDOSULFAN-SULFATE	5.55E-3	1.0%	2.8E-10	NA	NA	2.0E-9	NA	NA
ENDRIN	1.88E-2	1.0%	9.5E-10	NA	NA	6.6E-9	3.00E-4	2.2E-5
ENDRIN-ALDEHYDE	3.14E-2	1.0%	1.6E-9	NA	NA	1.1E-8	NA	NA
ENDRIN-KETONE	8.37E-3	1.0%	4.2E-10	NA	NA	2.9E-9	NA	NA
gama-BHC	2.11E-3	1.0%	1.1E-10	NA	NA	7.4E-10	NA	NA
GAMMA-CHLORDANE	3.11E-2	1.0%	1.6E-9	NA	NA	1.1E-8	NA	NA
HEPTACHLOR	2.89E-3	1.0%	1.5E-10	4.50E+0	6.5E-10	1.0E-9	5.00E-4	2.0E-6
HEPTACHLOR-EPOXIDE	4.45E-3	1.0%	2.2E-10	9.10E+0	2.0E-9	1.6E-9	1.30E-5	1.2E-4
INDENO(1,2,3-cd)PYRENE	9.35E-1	1.0%	4.7E-8	NA	NA	3.3E-7	NA	NA
METHOXYCHLOR	2.95E-2	1.0%	1.5E-9	NA	NA	1.0E-8	5.00E-3	2.1E-6
METHYLENE-CHLORIDE	1.29E-2	1.0%	6.5E-10	7.50E-3	4.9E-12	4.5E-9	6.00E-2	7.6E-8
NAPTHALENE	2.13E-1	1.0%	1.1E-8	NA	NA	7.5E-8	4.00E-2	1.9E-6
TETRACHLOROETHENE	6.85E-3	1.0%	3.4E-10	5.20E-2	1.8E-11	2.4E-9	1.00E-2	2.4E-7
TOLUENE	8.03E-3	1.0%	4.0E-10	NA	NA	2.8E-9	2.00E-1	1.4E-8
XYLENE	6.81E-3	1.0%	3.4E-10	NA	NA	2.4E-9	2.00E+0	1.2E-9
2,3,7,8-TCDD (Equiv)	2.48E-4	1.0%	1.2E-11	1.50E+5	1.9E-6	8.7E-11	NA	NA
TOTAL					8.69E-6			0.19

LADI : Lifetime Average Daily Intake (Cancer)
CDI : Chronic Daily Intake (Noncancer)
NA : Toxicity criteria not available.

Summary Intake Factor, cancer: 5.0E-6
Summary Intake Factor, noncancer: 3.5E-5

(a) The oral slope factor for metals was divided by 5% to adjust for adsorption effeciency
(b) The oral reference dose for metals was multiplied by 5% to adjust for adsorption effeciency

Source: Ecology and Environment, Inc. 1994

ATTACHMENT S.C

INTEGRATED EXPOSURE UPTAKE BIOKINETIC MODEL INPUT AND OUTPUT DATA

Table S.C-1

SUMMARY OF ENVIRONMENTAL LEAD CONCENTRATIONS FOR STUDY GROUP RESIDENCES
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

	Composited Sieved Surface Soils (mg/kg)					Water (µg/L)		Dust (mg/kg)			Produce (mg/kg)				Paint Chip (mg/kg)		
Location	Front Yard	Back Yard	Drip Line	Play Area	Garden	First Draw	Three Minute Purge	Main Entrance	Bedroom Average	Alternative Location	Carrot	Parsley	Garlic	Cabbage	Indoor Sample	Outdoor Sample #1	Outdoor Sample #2
SG001	403	293	53.2	--	460	3 U	3 U	598	206 (h)	--	--	--	--	--	--	33	--
SG002	150	254	50.2	--	21.4	3 U	3 U	82.9	133 (i)	--	--	--	--	--	--	--	--
SG003	23.7	22	63.5	--		3 U	3 U	197	464 (j)	--	--	--	--	--	--	--	--
SG004	1330	1500	89.4	70.8	86.8	5.3	3 U	688	1065 (k)	--	.05 U	.2 U	.69 U	0.071 U	--	99	--
SG005	66.8	215	285	--	96	17	3 U	125	18.5 (l)	--	--	--	--	--	--	28U	30U
SG006	86.5	63.2	155	--	65.8	3 U	3 U	140	109 (m)	--	--	--	--	--	65	--	--
SG007	104	59.3	574	--	--	3 U	3 U	245	154 (n)	--	--	--	--	--	--	15700	--
SG008	126	111	793	--	--	7.5	3 U	394	173 (o)	--	--	--	--	--	29U	15300	--
SG009	102	214 (a)	213	--	--	3 U	3 U	308	126 (p)	--	--	--	--	--	--	5210	6610
SG010	353	51.2	282	--	--	3.4	3 U	85.1	205 (q)	--	--	--	--	--	74	--	--
SG011	454 (b)	74.3 (b)	348	--	--	3.1	3 U	15	92.8 (r)	--	--	--	--	--	28 U	--	--
SG012	102	31.6 (c)	308	--	--	7.2	5.4	243	264	133 (s)	--	--	--	--	--	198	--
SG013	278	924 (d)	1270	--	213 (e)	10	3	230	165 (t)	--	--	--	--	--	--	--	--
SG014	770	230	899	--	--	7.1	3.1	278	147 (u)	--	--	--	--	--	49	--	9360
SG015	143	59.2	53	42.4	--	5.8	6.6	292	24.3 (v)	--	--	--	--	--	--	--	--
SG016	1340	645	925	122	141	8.5	7.6	6.7	57.9 (w)	--	--	--	--	--	--	28 U	--
SG017	222	179	186	--	--	5.9	4	18.6	21.4 (x)	--	--	--	--	--	--	--	--

Key and footnotes on last page.

Source: Ecology and Environment, Inc., 1994

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Table S.C-1 (cont.)

SUMMARY OF ENVIRONMENTAL LEAD CONCENTRATIONS FOR STUDY GROUP RESIDENCES
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

	Sieved Surface Soils (mg/kg)					Water (µg/L)		Dust (mg/kg)			Produce (mg/kg)				Paint Chip (mg/kg)		
Location	Front Yard	Back Yard	Drip Line	Play Area	Garden	First Draw	Three Minute Purge	Main Entrance	Bedroom Average	Alternative Location	Carrot	Parsley	Garlic	Cabbage	Indoor Sample	Outdoor Sample #1	Outdoor Sample #2
SG018	130	184	482	--	--	3.5	4.6	34.2	22.1 (y)	--	--	--	--	--	29 U	6010	
SG019	647	1090	1400	--	--	6.5	4	29	6.4	9.3 (z)	--	--	--	--	--	--	--
SG020	494	109	1480	--	--	3 U	4.5	153	270 (aa)	--	--	--	--	--	--	7530	--
SG021	504	783	--	--	--	9.8	3 U	7.6	24.3 (bb)	--	--	--	--	--	--	29 U	--
SG022	188	211	320	--	--	3.4	3.6	48.1	48.4 (cc)	--	--	--	--	--	--	--	--
SG023	115	85.841	135	71.5	57.5	5.9	5.3	12.7	5.3 (dd)	--	--	--	--	--	--	--	--
SG024	594	391	1110	--	--	5.3	3.7	16.2	50 (ee)	--	--	--	--	--	54	--	--
SG025	606	907	645	--	--	6	3 U	20	51.2 (ff)	--	--	--	--	--	--	--	--
SG027	319	430	621	--	--	4.1	4.7	64.3	8.35 (gg)	--	--	--	--	--	29U	108	28U
SG028	87.5 (f)	540 (g)	635	--	--	3 U	6.5	20.8	24 (hh)	--	--	--	--	--	29U	2860	--
SG029	129	124	592	--	--	3.5	4.8	20.8	137 (ii)	--	--	--	--	--	--	7210	--
SG030	68	292	151	--	40	3 U	4.8	--	7.7 (jj)	--	--	--	--	--	--	29U	--
SG031	1380	233	1150	--	--	6	3.5	66	0.24 (kk)	--	--	--	--	--	107	33	
SG032	138	25.8	944	--	--	3.4	4	0.61	0.53 (ll)	--	--	--	--	--	--	--	--
SG033	136	503	1280	--	--	5.3	5.4	0.24	0.26 (mm)	--	--	--	--	--	--	--	--
SG034	217	170	924	--	553	6	3 U	0.23	0.53 (nn)	--	.05 U	.2 U	.69 U	0.071 U	--	--	--

Source: Ecology and Environment, Inc., 1994

on next page.

Key and footnotes:

(a) Sample collected from clothesline area. Considered, for ease of presentation, a back yard sample.
(b) Two samples were collected from the area surrounding the building in which Gordon Plaza #129 is located. Considered, for ease of presentation, front yard and back yard samples.
(c) Sample collected near fountain. Considered, for ease of presentation, a back yard sample.
(d) Sample collected from inner court yard. Considered, for ease of presentation, a back yard sample.
(e) Sample collected north of plant box. Considered, for ease of presentation, a garden sample.
(f) Average of samples collected from front yard and area of stressed vegetation.
(g) Sample collected from clothesline area. Considered, for ease of presentation, a back yard sample.
(h) Average of samples collected from two bedrooms (173 mg/kg in first bedroom and 239 mg/kg in master bedroom).
(i) Average of samples collected from two bedrooms (164 mg/kg in second bedroom and 101 mg/kg in master bedroom).
(j) Average of samples collected from two bedrooms (542 mg/kg in child's bedroom and 385 mg/kg in master bedroom).
(k) Average of samples collected from two bedrooms (709 mg/kg in child's room and 1,420 mg/kg in master bedroom).
(l) Average of samples collected from two bedrooms (27.5 mg/kg in first bedroom and 9.47 mg/kg in second bedroom).
(m) Average of samples collected from two bedrooms (96.4 mg/kg in baby's bedroom and 122 mg/kg in master bedroom).
(n) Average of samples collected from two bedrooms (213 mg/kg in guest bedroom and 95.1 mg/kg in master bedroom).
(o) Average of samples collected from two bedrooms (157 mg/kg in child's bedroom and 188 mg/kg in master bedroom).
(p) Average of samples collected from two bedrooms (154 mg/kg in second bedroom and 97.9 mg/kg in first bedroom).
(q) Average of samples collected from two bedrooms (187 mg/kg in second bedroom and 222 mg/kg in master bedroom).
(r) Average of samples collected from two bedrooms (70.5 mg/kg in first bedroom and 115 mg/kg in master bedroom).
(s) Sample collected from bathroom.
(t) Average of samples collected from two bedrooms (151 mg/kg in second bedroom and 179 mg/kg in master bedroom).
(u) Average of samples collected from two bedrooms (161 mg/kg in first bedroom and 132 mg/kg in master bedroom).
(v) Average of samples collected from two bedrooms (21.6 mg/kg in first bedroom and 26.9 mg/kg in master bedroom).
(w) Average of samples collected from two bedrooms (104 mg/kg in second bedroom and 11.7 mg/kg in master bedroom).
(x) Average of samples collected from two bedrooms (15.8 mg/kg in second bedroom and 27 mg/kg in master bedroom).
(y) Average of samples collected from two bedrooms (24.2 mg/kg in third bedroom and 20.1 mg/kg in first bedroom).
(z) Sample collected from bathroom.
(aa) Average of samples collected from two bedrooms (412 mg/kg in second bedroom and 128 mg/kg in master bedroom).
(bb) Average of samples collected from two bedrooms (8.8 mg/kg in first bedroom and 39.8 mg/kg in master bedroom).
(cc) Average of samples collected from two bedrooms (55.3 mg/kg in first bedroom and 41.5 mg/kg in master bedroom).
(dd) Average of samples collected from two bedrooms (4.2 mg/kg in first bedroom and 6.4 mg/kg in master bedroom).
(ee) Average of samples collected from two bedrooms (85.3 mg/kg in first bedroom and 14.7 mg/kg in fourth bedroom).
(ff) Average of samples collected from two bedrooms (41 mg/kg in first bedroom and 61.4 mg/kg in master bedroom).
(gg) Average of samples collected from two bedrooms (12.6 mg/kg in second bedroom and 4.1 mg/kg in master bedroom).
(hh) Average of samples collected from two bedrooms (32 mg/kg in second bedroom and 15.9 mg/kg in first bedroom).
(ii) Average of samples collected from two bedrooms (250 mg/kg in second bedroom and 24.4 mg/kg in third bedroom).
(jj) Average of samples collected from two bedrooms (5.6 mg/kg in second bedroom and 9.8 mg/kg in master bedroom).
(kk) Average of samples collected from two bedrooms (0.23 mg/kg in second bedroom and 0.25 mg/kg in master bedroom).
(ll) Average of samples collected from two bedrooms (0.37 mg/kg in master bedroom and 0.68 mg/kg in second bedroom).
(mm) Average of samples collected from two bedrooms (0.17 mg/kg in second bedroom and 0.34 mg/kg in master bedroom).
(nn) Average of samples collected from two bedrooms (0.13 mg/kg in first bedroom and 0.93 mg/kg in master bedroom).
(oo) Sample collected from 1.5 feet below surface; not used in the IEUBK model.

U: Not detected. One-half of the detection limit used to calculate average.

Source: Ecology and Environment, Inc., 1994

S.C-5

14/95

001160.0776

Table S.C-2

SUMMARY OF ENVIRONMENTAL LEAD DATA FOR BACKGROUND RESIDENCES
AGRICULTURE STREET LANDFILL
NEW ORLEANS, LOUISIANA

Location	Sieved Surface Soils (mg/kg)					Water (µg/L)		Dust (mg/kg)			Paint Chip (mg/kg)	
	Front Yard	Back Yard	Drip Line	Play Area	Garden	First Draw	Three Minute Purge	Main Entrance	Average Bedroom	Alternative Location	Indoor	Outdoor
SG026	62.7 (a)	113	65.3			6	3 U	5.1 (e)	21.75 (f)			
SG035	8.5	5.6		5.1		12	6.1	20	36.5 (g)			29 U
SG036	724 (b)	848	1420			3.4	3.1	327	12.65 (h)			67,600
SG037	28.6	24.5 (c)	83			4.4	3 U	4.3	1.3 (i)		29 U	
SG038	42.9 (d)	39.2	178			3.6	3 U	1.4	29.1	83.6 (j)		43

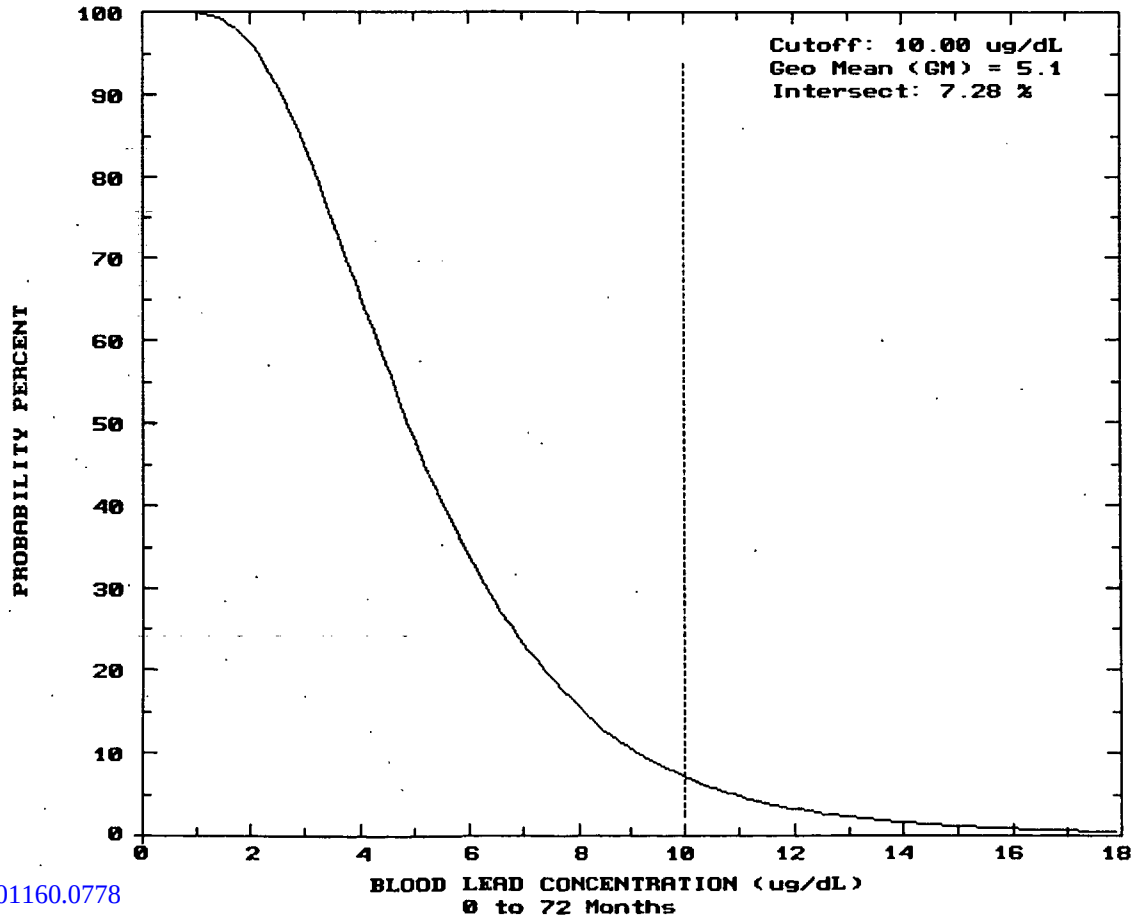
(a) Average of concentrations detected in two samples collected in front yard (49.2 and 66.2 mg/kg).
(b) Average of concentrations detected in two samples collected in front yard (780 and 767 mg/kg).
(c) Average of concentrations detected in samples collected from side yard (27.3 and 32.7 mg/kg).
(d) Average of concentrations detected in front yard (34.999 and 39.5 mg/kg).
(e) Sample collected from the dining room.
(f) Average of samples collected from two bedrooms (37.2 mg/kg in master bedroom and 6.3 mg/kg in first bedroom).
(g) Average of two samples collected from first bedroom (33 and 40 mg/kg).
(h) Average of samples collected from two bedrooms (13.7 mg/kg in master bedroom and 11.6 mg/kg in first bedroom).
(i) Average of samples collected from two bedrooms (1.2 mg/kg in master bedroom and 1.4 mg/kg in first bedroom).
(j) Sample collected from the study.

Key:

U: Not detected. One-half of the detection limit was used as the concentration.

Source: Ecology and Environment, Inc.

Example Output File: Probability versus Blood Lead Concentration (SG-021)



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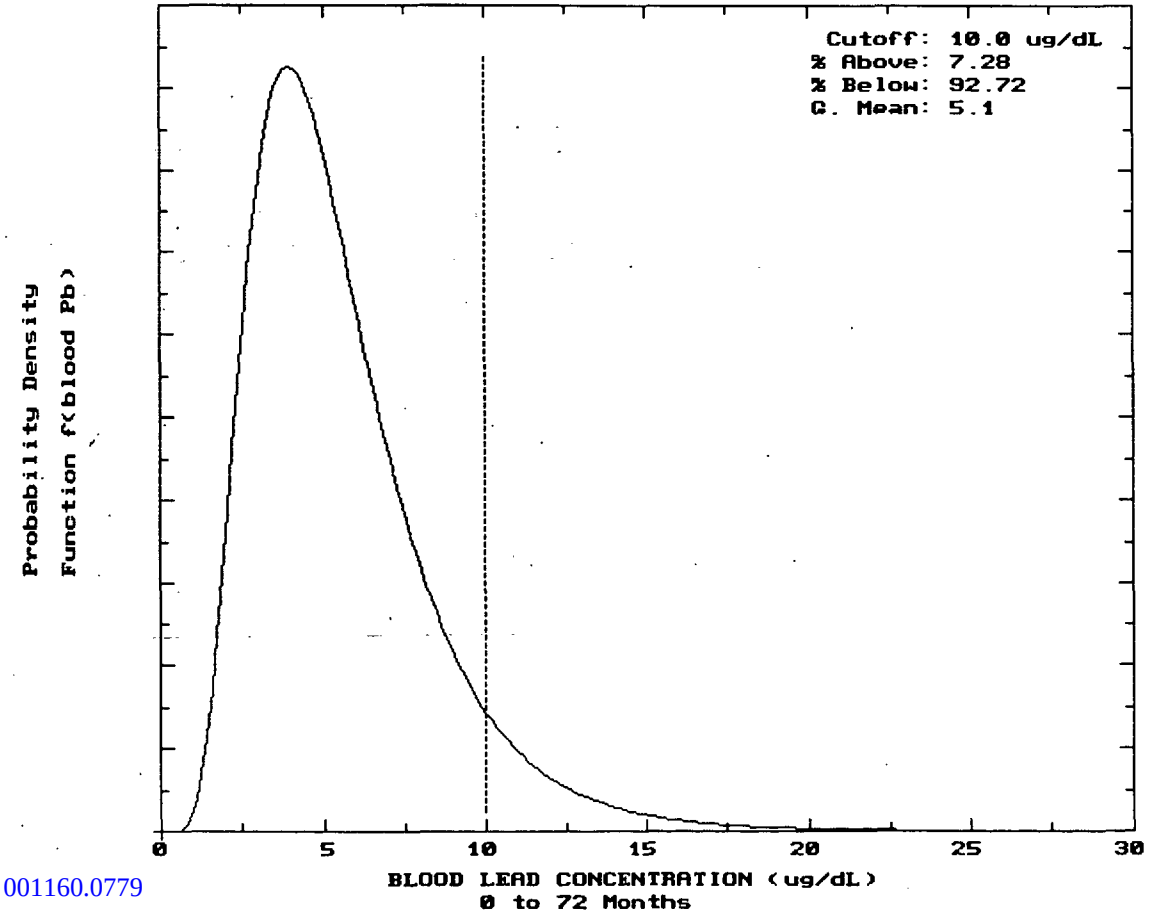
Example Output File: Probabilty Density versus
Blood Lead Concentration (SG-021)



001160.0779

```
»Data Input File for Study Group Residence #21
»Agriculture Street Landfill, New Orleans, Louisiana
0.100 2.0 32.0 1.0
0.100 3.0 32.0 2.0
0.100 5.0 32.0 3.0
[illegible]00 5.0 32.0 4.0
[illegible]0 5.0 32.0 4.0
[illegible]100 7.0 32.0 4.0
0.100 7.0 32.0 4.0
0.100 0 0 30.0
5.53 50.0
5.78 50.0
6.49 50.0
6.24 50.0
6.01 50.0
6.34 50.0
7.00 50.0
0 0.000 0.135 0.000 0.000
0.0 25.0 0.0 0.0
0.20 50.0
0.50 50.0
0.52 50.0
0.53 50.0
0.55 50.0
0.58 50.0
0.59 50.0
1 5.65 1.50 9.80 10.00
50.0 15.0
0.0 0.0 0.085 30.0 30.0
0.0 0.0 0.135 30.0 30.0
0.0 0.0 0.135 30.0 30.0
0.0 0.0 0.135 30.0 30.0
0.0 0.0 0.100 30.0 30.0
0.0 0.0 0.090 30.0 30.0
0.0 0.0 0.085 30.0 30.0
0 0 2
45.0 0.70 100.0 643.5 16.0
1200.0 200.0 200.0 200.0 1200.0
0.0 0.0 0.0 0.0 0.0
[illegible]0 30.0
[illegible]0 30.0
0.00 30.0
0.00 30.0
0.00 30.0
0.00 30.0
0.00 30.0
1.600000 10.000000
0.000 0.000
0.000 0.000
0.000 0.000
0.000 0.000
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ATTACHMENT S.D

HEALTH EFFECTS SUMMARIES

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HEALTH EFFECTS SUMMARIES

This attachment contains health effects summaries which describe the potential toxic properties of contaminants of potential concern (COPCs) at the ASL site. The chemicals described in the following pages are those that were associated with estimated excess cancer risks of between 10^{-4} and 10^{-6} and/or hazard quotients of 1 or greater. In most cases, the information in the summaries is drawn from the Public Health Statement in the Toxicological Profile for the chemical, prepared by the Agency for Toxic Substances and Disease Registry (ATSDR). In April 1993, ATSDR published fact sheets for twenty of the most commonly found chemicals at hazardous waste sites. These facts sheets are included for some of the COPCs, including antimony, arsenic, barium, benzene, beryllium, cadmium, chloroform, chromium, copper, DDT, diazinon, 1,4-dichlorobenzene, 1,1,dichloroethylene, dioxins, lead, vanadium, and zinc.

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Antimony

Antimony is a naturally occurring element that can be found in the environment in a variety of mineral forms. It is used industrially in metal alloys and for producing fireproofing chemicals, ceramics, glassware, and pigments. Antimony also has been used medicinally as an antiparasitic agent. Antimony occurs naturally in air, soil, food, and water at very low levels. Much of the antimony in the environment is bound tightly to dust, soil, and rocks. However, people can breathe high levels of antimony in dust if they live near antimony mines or processing companies.

Antimony can enter the body by absorption from the gastrointestinal tract following ingestion of food or water containing antimony, or by absorption from the lungs after inhalation. Ingestion of high doses of antimony can result in burning stomach pains, colic, nausea, and vomiting. Long-term occupational inhalation exposure has caused heart problems; stomach ulcers; and irritation of the lungs, eyes, and skin.

The critical or most sensitive noncarcinogenic effects of exposure to antimony are shortened lifespan, reduced blood glucose levels, and altered cholesterol levels. The oral RfD for antimony, 4E-04 mg/kg-day, is based on a chronic oral bioassay, in which 5 ppm of potassium antimony tartrate was administered to rats in their drinking water. Existing data suggest that antimony may be an animal carcinogen but are not sufficient to justify a quantitative cancer potency estimate at this time. In laboratory rats, inhalation of antimony dust can increase the risk of lung cancer. However, there is no evidence of increased risk of cancer to animals from eating food or drinking water containing antimony. It is not known whether antimony can cause cancer in humans.

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Arsenic

Arsenic is a naturally occurring element and is usually found combined with one or more elements, such as oxygen or sulfur. This element is widely distributed in the environment from natural sources, but higher concentrations have been found to occur in association with chemical waste, smelting of copper and other metals, fossil fuel combustion, and pesticide use. The primary use of arsenic is as a wood preservative, but it is also used to make insect and weed killers and pharmaceuticals.

All people are exposed to low levels of arsenic because it is naturally occurring and low levels are present in food, water, soil, and air. Workers in several industries (nonferrous smelting, wood preservation, arsenical pharmaceutical production, and production and application of arsenical pesticides) may be exposed to significantly higher levels. Since ancient times, arsenic has been recognized as a human poison. Large oral doses can be lethal. Chronic arsenic overexposure may cause many health effects including body weight changes, changes in the blood, and liver and kidney damage. The critical or most sensitive effects, based on chronic oral exposure to humans, are hyperpigmentation, keratosis, and possible vascular complications. The oral RfD for arsenic, 3E-04 mg/kg-day, is based on chronic oral human exposure in drinking water.

Arsenic is considered a Group A, human carcinogen, by EPA. Epidemiologic studies and case reports have found evidence that arsenic exposure is associated with increased risk of cancer of the skin, lungs, bladder and kidneys. In workers exposed by the inhalation pathway, increased risk of lung cancer is the major carcinogenic effect. If humans are exposed by the oral route, the major carcinogenic effect is an increased risk of skin cancer. Oral and inhalation slope factors also have been derived for arsenic. The oral slope factor ($1.75\ mg/kg\text{-}day^{-1}$) is based on increased incidence of skin cancer in humans who consumed drinking water with high arsenic concentrations. The inhalation slope factor ($1.51E+01\ mg/kg\text{-}day^{-1}$) is derived from observations of increased lung cancer mortality in occupationally exposed males.

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Barium

Barium is a naturally occurring element that comprises 0.05 percent of the earth's crust. Barium compounds are used commercially in the metallurgic, paint, glass, ceramic, and electronics industries and for medicinal purposes.

Background levels of barium in the environment are very low. Barium can enter the body through inhalation or ingesting food or water containing barium or its compounds. Little is known about the human health effects of barium. Most of the reported data are derived from short-term exposure to large amounts of barium. Ingestion of barium can cause many effects including: breathing difficulty; increased blood pressure; changes in heart rhythm, blood, and nerve reflexes; stomach irritation; swelling of the brain; and damage to the liver, kidney, heart, and spleen.

The critical or most sensitive effect from oral exposures, seen in animal studies, is a significant increase in blood pressure. Other long-term effects are changes in function and chemistry of the heart and reduced life span. The oral RfD for barium, 7E-02 mg/kg-day, is derived from subchronic to chronic in human drinking water studies in which increased blood pressure was identified as the critical effect. This RfD is based on a weight-of-evidence approach because no single study is appropriate to calculate a lifetime RfD for barium. Adverse effects associated with inhalation of barium dusts have not been well-characterized. Smaller litter size and increased miscarriage rates have been reported as critical effects from inhalation of barium. There is no reliable information to determine whether barium can cause cancer in animals or people.

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ARSENIC

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about arsenic. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to higher than average levels of arsenic happens mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. Arsenic is a powerful poison. At high levels, it can cause death or illness. This chemical has been found in at least 781 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is arsenic? (Pronounced ar´ se - nik)

Arsenic is found in nature at low levels. It's mostly in compounds with oxygen, chlorine, and sulfur. These are called inorganic arsenic compounds. Arsenic in plants and animals combines with carbon and hydrogen. This is called organic arsenic. Organic arsenic is usually less harmful than inorganic arsenic.

Most arsenic compounds have no smell or special taste.

Inorganic arsenic compounds are mainly used to preserve wood. They are also used to make insecticides and weed killers. You can check the labels of treated wood and insecticides to see if they contain arsenic.

Copper and lead ores contain small amounts of arsenic.

What happens to arsenic when it enters the environment?

- It doesn't evaporate.
- Most arsenic compounds can dissolve in water.
- It gets into air when contaminated materials are burned.
- It settles from the air to the ground.
- It doesn't break down, but can change from one form to another.
- Fish and shellfish build up organic arsenic in their tissues, but most of the arsenic in fish isn't toxic.

How might I be exposed to arsenic?

- Breathing sawdust or burning smoke from wood containing arsenic
- Breathing workplace air
- Ingesting contaminated water, soil, or air at waste sites
- Ingesting contaminated water, soil, or air near areas naturally high in arsenic.

How can arsenic affect my health?

Inorganic arsenic is a human poison. Organic arsenic is less harmful.

High levels of inorganic arsenic in food or water can be fatal. A high level is 60 parts of arsenic per million parts of food or water (60 ppm). Arsenic damages many tissues including nerves, stomach and intestines, and skin. Breathing high levels can give you a sore throat and irritated lungs.

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Lower levels of exposure to inorganic arsenic may cause:

- Nausea, vomiting, and diarrhea
- Decreased production of red and white blood cells
- Abnormal heart rhythm
- Blood vessel damage
- A "pins and needles" sensation in hands and feet.

Long term exposure to inorganic arsenic may lead to a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.

Direct skin contact may cause redness and swelling.

How likely is arsenic to cause cancer?

The Department of Health and Human Services (DHHS) has determined that arsenic is a known carcinogen. Breathing inorganic arsenic increases the risk of lung cancer. Ingesting inorganic arsenic increases the risk of skin cancer and tumors of the bladder, kidney, liver, and lung.

Is there a medical test to show whether I've been exposed to arsenic?

Tests can measure your exposure to high levels of arsenic. These tests are not routinely performed in a doctor's office.

Arsenic can be measured in your urine. This is the most reliable test for arsenic exposure. Since arsenic stays in the body only a short time, you must have the test soon after exposure.

Tests on hair or fingernails can measure your exposure to high levels of arsenic over the past 6-12 months. These tests are not very useful for low level exposures.

These tests do not predict whether you will have any harmful health effects.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) sets limits on the amount of arsenic that industrial sources can release. It restricted or canceled many uses of arsenic in pesticides and may restrict more. EPA set a limit of 0.05 parts per million (ppm) for arsenic in drinking water. EPA may lower this further.

The Occupational Safety and Health Administration (OSHA) established a maximum permissible exposure limit for workplace airborne arsenic of 10 micrograms per cubic meter ($\mu g/m^3$).

Glossary

Carcinogen: Substance that can cause cancer.
Ingesting: Taking food or drink into your body.
PPM: Parts per million.
Microgram (μg): One millionth of a gram.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for arsenic. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Case studies in environmental medicine: Arsenic toxicity. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns. For more information, contact: Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333, Phone: 404-639-6000.

Benzene

Benzene occurs in the environment as a result of both natural processes and human activity. Today, most benzene is produced from petroleum sources. Benzene has a long history of industrial use, most notable as a solvent and as a starting material for the synthesis of other chemicals.

Benzene evaporates easily, and exposure of the general public to benzene occurs mainly by breathing contaminated air. The major sources of benzene in air are gasoline and automobile exhaust, tobacco smoke, and industrial emissions. It has been estimated that 50 percent of the exposure to benzene in the United States is due to tobacco smoke. Household products including glues, paints, furniture wax, and detergents also can be a source of exposure.

Benzene is readily absorbed by inhalation and ingestion, but is absorbed to a lesser extent through the skin. Most of what is known about the human health effects of benzene exposure is based on studies of workers, who were usually exposed for long periods to high concentrations of benzene.

Benzene is toxic to blood-forming organs and to the immune system. Excessive exposure (inhalation of concentrations of 10 to 100 ppm) can result in anemia, a weakened immune system, and headaches. Occupational exposure to benzene may be associated with spontaneous abortions and miscarriages (supported by limited animal data), and certain developmental abnormalities such as low birth weight, delayed bone formation, and bone marrow toxicity. Benzene is classified as a Group A human carcinogen based on numerous studies documenting excess leukemia mortality among occupationally exposed workers.

The oral and inhalation slope factors for benzene, 2.9E-02 and 2.91E-02 mg/kg-day^{-1}, respectively, are based on the statistically significant increased incidence of leukemia in individuals with 5 or more years of occupational inhalation exposure to benzene. Oral and inhalation RfDs for benzene are not currently available.

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BENZENE

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about benzene. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to benzene happens mostly from breathing contaminated air from industry, automobile exhaust, tobacco smoke, or gasoline fumes. Breathing very high levels of benzene can be fatal. Breathing lower levels over a long period of time can harm blood cells and cause cancer. This chemical has been found in at least 743 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is benzene? (Pronounced ben′ zēn)

Benzene is a colorless liquid with a sweet odor. It is also called benzol.

Benzene gets into the environment from human and natural activities. Natural sources like volcanoes and forest fires release small amounts of benzene to the environment. Benzene is also found in crude oil and gasoline. The main release of benzene to the environment comes from the use of oil and gasoline, and its use as a major industrial chemical.

Industry uses benzene to make chemicals for styrofoam, plastics, resins, nylon, and synthetic fibers. It is also used to make some types of rubber, lubricants, dyes, detergents, drugs, and pesticides.

What happens to benzene when it enters the environment?

- As a vapor, benzene mixes with air very quickly.
- It reacts with other chemicals in the air, and breaks down within a few days.
- In liquid form, benzene mixes easily in water.
- Benzene in water changes quickly into a vapor, and goes into the air.

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- ore slowly in water than in air.
- It can move from soil to groundwater.
- Plants and animals do not store high levels of it.

How might I be exposed to benzene?

- The most common exposure is from breathing benzene in air.
- Tobacco smoke is the source of about 50 percent of most people's total exposure.
- Auto exhaust and industrial emissions are the source of about 20 percent of most people's total exposure.
- Highest levels in air may be found in the workplace (rubber industry, oil refineries, chemical plants, shoe manufacturing, gasoline storage, shipment and retail).
- Glues, paints, furniture wax, and detergents are common sources.
- Breathing vapors from contaminated water or soil.

How can benzene affect my health?

Benzene is harmful, especially to the tissues that form blood cells.

Brief exposures of 5-10 minutes to benzene in air at **very high levels** (500,000 times the average levels) can cause death.

High levels (50,000 times the average levels) can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. In most cases,

these effects will stop once exposure ends and you begin to breathe fresh air.

Breathing **lower levels** for long periods may damage blood cells and bone marrow. This can cause anemia or excessive bleeding or cancer of the white blood cells (leukemia). Benzene may also harm the immune system and increase the chance for infection.

Eating or drinking high levels of benzene can cause:

- Vomiting or irritation of the stomach
- Dizziness, sleepiness, or convulsions
- Rapid heart rate, coma, and death.

The health effects from eating or drinking foods with low levels of benzene are not known.

Direct contact with the skin may cause redness and sores. Benzene may irritate and damage your eyes.

Animal studies indicate that benzene may damage genes and may affect the ability to have healthy children.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Benzene is associated with leukemia, a cancer of the blood-forming tissues.

Is there a medical test to show whether I've been exposed to benzene?

Tests can measure the amount of benzene in breath and blood. Most tests must be done soon after the exposure because benzene does not stay in the body for a long time. The blood test is accurate only for recent exposures. The breath test is not useful for very low levels of exposure.

Your body converts benzene to other compounds, including phenol, which can also be measured in urine.

These tests can't tell how much benzene you were exposed to or the possible health effects.

These tests may be available at your doctor's office.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) sets a maximum permissible level of benzene in drinking water at 5 parts of benzene per billion parts of water (5 ppb) per day for a lifetime of exposure. EPA sets a goal of 0 ppb benzene in drinking water and in rivers and lakes. The maximum permissible level of benzene in water for short-term exposures (10 days) for children is 235 ppb.

EPA requires that the National Response Center be notified of a discharge or spill into the environment of 1,000 pounds or more of benzene.

The Occupational Safety and Health Administration (OSHA) sets an occupational exposure limit of 1 part per million (ppm) in air for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogen: Substance that can cause cancer.
Leukemia: A cancer of the blood-forming tissues.
PPB: Parts per billion.
PPM: Parts per million.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for benzene. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Case studies in environmental medicine: Benzene toxicity. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns. For more information, contact: Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333, Phone: 404-639-6000.

Beryllium

Pure beryllium is a hard gray metal. In nature it occurs as a chemical component of certain rocks. The minerals bertrandite and beryl are mined commercially for recovery of beryllium.

Most beryllium ore is processed into pure metal, alloys, or beryllium oxide. Beryllium metal and alloys are used in electronics, aircraft and space craft structures, X-ray machines, nuclear weapons, and nuclear reactors. Beryllium oxide is used in the manufacture of specialty ceramics.

Beryllium is released into the air by natural sources such as volcanic dust; however, the major emission source to the environment is the burning of fossil fuels. Beryllium compounds are naturally present in soils, but deposition of atmospheric beryllium and disposal of beryllium-containing wastes can increase the levels in localized areas. The general population is exposed to low levels of beryllium in air, food, and water. Beryllium occurs naturally in tobacco and can be inhaled in cigarette smoke.

Industrial workers have the highest exposure to beryllium in the mining, milling, and processing of beryllium to alloys or beryllium oxide. In general, the primary route of exposure to beryllium is inhalation, since relatively little beryllium is absorbed from the gastrointestinal (GI) tract or through the skin.

The respiratory tract is the major target of inhalation exposure to beryllium. Short-term exposure can produce lung inflammation and pneumonia-like symptoms. Long-term exposure can cause berylliosis, an immune reaction characterized by noncancerous growths on the lungs. Similar growths can appear on the skin of sensitive individuals exposed by dermal contact.

Epidemiological studies have found that an increased risk of lung cancer may result from exposure to beryllium in industrial settings. In addition, laboratory studies have shown that breathing beryllium causes lung cancer in animals. However, it is not clear whether excess cancer risk is associated with ingestion of beryllium.

EPA has classified beryllium as a Group B2, probable human carcinogen, based on limited human evidence and animal data. The International Agency for Research on Cancer (IARC) has concluded that there is sufficient evidence that beryllium is an animal carcinogen, but there is limited human evidence. Consequently, IARC concludes that beryllium should be suspected of being a human carcinogen.

Oral (4.3E+00 mg/kg-day^{-1}) and inhalation (8.4E+00 mg/kg-day^{-1}) slope factors also have been derived for beryllium. The oral slope factor is based on gross tumors in rats exposed to beryllium in their drinking water. The inhalation slope factor is derived from

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human occupational exposure studies. The oral RfD for beryllium, 5E-03 mg/kg-day, is developed from a NOAEL of 5 ppm in drinking water administered to rats.

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BERYLLIUM

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about beryllium. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to beryllium happens mostly in the workplace, near some hazardous waste sites, and from breathing tobacco smoke. Lung damage has been observed in some people who have breathed contaminated air. Some people become highly sensitive to beryllium exposure. Beryllium has been found in at least 349 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is beryllium? (Pronounced ber-il´ le-um)

Pure beryllium is a hard, grayish metal. In nature, beryllium can be found in compounds in mineral rocks, coal, soil, and volcanic dust. Beryllium compounds are commercially mined, and the beryllium purified for use in electrical parts, machine parts, ceramics, aircraft parts, nuclear weapons, and mirrors.

Beryllium compounds have no particular smell.

What happens to beryllium when it enters the environment?

- Beryllium dust gets into air from burning coal and oil.
- Beryllium dusts settles from air to the soil and water.
- It enters water from rocks and soil, and from industrial waste.
- Some beryllium compounds dissolve in water, but most settle to the bottom as particles.
- Beryllium particles in ocean water may take a few hundred years to settle to the bottom.
- Most beryllium in soil doesn't move up to the surface or into the groundwater.
- Fish do not build up beryllium in their bodies from the surrounding water to any great extent.

How might I be exposed to beryllium?

- Background levels in air, food, and water are low.
- Breathing contaminated workplace air (e.g., mining or processing ores, alloy and chemical manufacturing with beryllium, machining or recycling metals containing beryllium)
- Beathing tobacco smoke from leaf high in beryllium
- Breathing contaminated air or ingesting water or food near industry or hazardous waste sites.

How can beryllium affect my health?

Beryllium can be harmful if you breathe it. The effects depend on how much you are exposed to and for how long.

High levels of beryllium in air cause lung damage and a disease that resembles pneumonia. If you stop breathing beryllium dust, the lung damage may heal.

Some people become sensitive to beryllium. This is called a hypersensitivity or allergy. These individuals develop an inflammatory reaction to **low levels** of beryllium. This condition is called chronic beryllium

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disease, and can occur long after exposure to small amounts of beryllium. This disease can make you feel weak and tired, and can cause difficulty in breathing.

Both the short-term, pneumonia-like disease and the chronic beryllium disease can cause death.

Swallowing beryllium has not been reported to cause effects in humans because very little beryllium can move from the stomach and intestines into the bloodstream.

Beryllium contact with scraped or cut skin can cause rashes or ulcers.

How likely is beryllium to cause cancer?

The Department of Health and Human Services (DHHS) has determined that beryllium and certain beryllium compounds may reasonably be anticipated to be carcinogens. This determination is based on animal studies and studies in workers. None of the studies provide conclusive evidence, but when taken as a whole, they indicate that long-term exposure to beryllium in the air results in an increase in lung cancer.

Is there a medical test to show whether I've been exposed to beryllium?

Tests can measure beryllium in the urine and blood. The amount of beryllium in blood or urine may not indicate how much or how recently you were exposed. Small amounts of human lung and skin can also be removed from the body and examined for beryllium. These tests can be done in a doctor's office or in a hospital.

One test uses blood cells washed out of the lung. If these cells start growing in the presence of beryllium, you are probably sensitive to beryllium and may have chronic beryllium disease.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) restricts the amount of beryllium that industries may emit into the environment to 10 grams (g) in a 24-hour period, or to an amount that would result in atmospheric levels of 0.01 micrograms (µg) beryllium per cubic meter (m^3)of air, averaged over a 30-day period.

The National Institute for Occupational Safety and Health (NIOSH) recommends a standard for occupational exposure of 0.5 µg beryllium/m^3 of workroom air during an 8-hour shift to protect workers from potential cancer.

The Occupational Safety and Health Administration (OSHA) sets a limit of 2 µg beryllium/m^3 of workroom air for an 8-hour work shift.

Glossary

Carcinogen: Substance that can cause cancer.
Ingesting: Taking food or drink into your body.
Hypersensitivity: A greater than normal bodily response to a foreign agent.
Microgram (µg): One millionth of a gram.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for beryllium Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Case studies in environmental medicine: Beryllium toxicity. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns. For more information, contact: Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333, Phone: 404-639-6000.

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Cadmium

Cadmium is a naturally occurring element present in trace amounts in the earth's crust. Cadmium has several industrial applications, but it is used mostly in metal plating and the manufacture of pigments, batteries, and plastics.

Humans are exposed to small quantities of cadmium because it is widely distributed in air, water, soil, and food. Cadmium can enter the body by absorption from the stomach or intestines after ingestion of food or water containing cadmium, or by absorption from the lungs after inhalation of cadmium-containing dust, mists, or fumes. Food and cigarette smoke are probably the largest sources of cadmium for the general public. Very little cadmium enters the body through the skin.

Cadmium can cause a number of adverse health effects. Ingestion of high doses causes severe irritation to the stomach, leading to vomiting and diarrhea, while inhalation can lead to severe irritation of the lungs and may cause death. People have committed suicide by drinking water containing high levels of cadmium. There is very strong evidence that the kidney is the main target organ of cadmium toxicity following chronic exposure. Long-term ingestion of cadmium has caused kidney damage and fragile bones in humans. Long-term human exposure by the inhalation route may cause kidney damage and lung disease such as emphysema. The most sensitive or critical effect of cadmium exposure is significant proteinuria, indicative of abnormal kidney function. Oral RfDs (5E-04 mg/kg-day [water] and 1E-03 mg/kg-day [food]) and an inhalation slope factor (6.3E+00 mg/kg-day^{-1}) have been derived for cadmium. The oral RfDs are based on a toxicokinetic model which predicts a NOAEL for chronic cadmium exposure from water of 5E-03 mg/kg-day. The critical effect is significant proteinuria. In chronic human studies a NOAEL of 0.01 mg/kg-day in food was identified; applying an uncertainty factor of 10, an RfD of 1E-03 mg/kg-day is derived.

Long-term inhalation of air containing cadmium by workers is associated with an increased risk of lung cancer. Laboratory rats that breathe cadmium have increased cancer rates. Studies of humans or animals have not demonstrated increased cancer rates from eating or drinking cadmium. EPA classifies cadmium as a Group B1, probable human carcinogen, based on occupational studies. The inhalation slope factor is based on increased incidence of mortality from lung, tracheal, and bronchial cancers among occupationally exposed males.

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CADMIUM

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about cadmium For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to cadmium happens mostly in the workplace where cadmium products are made. The general population is exposed from breathing cigarette smoke or eating cadmium contaminated foods. Cadmium damages the lungs, can cause kidney disease, and may irritate the digestive tract. Cadmium has been found in at least 388 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is cadmium? (Pronounced kad′ mē-um)

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide). It doesn't have a definite taste or odor.

All soils and rocks, including coal and mineral fertilizers, have some cadmium in them. The cadmium that industry uses is extracted during the production of other metals like zinc, lead, and copper.

Cadmium does not corrode easily and has many uses. In industry and consumer products, it is used for batteries, pigments, metal coatings, and plastics.

What happens to cadmium when it enters the environment?

- Cadmium enters air from mining, industry, and burning coal and household wastes.
- Cadmium particles in air can travel long distances before falling to the ground or water.
- It enters water and soil from waste disposal and spills or leaks at hazardous waste sites.
- It binds strongly to soil particles.
- Some cadmium dissolves in water.
- It doesn't break down in the environment, but can change forms.
- Fish, plants, and animals take up cadmium from the environment.
- Cadmium stays in the body a very long time and can build up from many years of exposure to low levels.

How might I be exposed to cadmium?

- Breathing contaminated workplace air (battery manufacturing, metal soldering or welding)
- Eating foods containing it; low levels in all foods (highest in shellfish, liver, and kidney meats)
- Breathing cadmium in cigarette smoke (doubles the average daily intake)
- Drinking contaminated water
- Breathing contaminated air near the burning of fossil fuels or municipal waste.

How can cadmium affect my health?

Breathing **high levels** of cadmium severely damages the lungs and can cause death. Eating food or drinking water with **very high levels** severely irritates the stomach, leading to vomiting and diarrhea.

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Long term exposure to lower levels of cadmium in air, food, or water leads to a build up of cadmium in the kidneys and possible kidney disease. Other potential long term effects are lung damage and fragile bones.

Animals given cadmium in food or water show high blood pressure, iron-poor blood, liver disease, and nerve or brain damage. We don't know if humans get any of these diseases from eating or drinking cadmium.

Skin contact with cadmium is not known to cause health effects in humans or animals.

How likely is cadmium to cause cancer?

The Department of Health and Human Services (DHHS) has determined that cadmium and cadmium compounds may reasonably be anticipated to be carcinogens.

This is based on weak evidence of increased lung cancer in humans from breathing cadmium and on strong evidence from animal studies. We do not know if cadmium causes cancer from skin contact or from eating or drinking contaminated food and water.

Is there a medical test to show whether I've been exposed to cadmium?

Tests are available in some medical laboratories that measure cadmium in blood, urine, hair, or nails.

Blood levels show recent exposure to cadmium, and urine levels show both recent and earlier exposure. Urine tests can indicate kidney damage. The reliability of tests for cadmium levels in hair or nails is unknown.

Tests are available to measure cadmium in your liver and kidney. The tests are expensive, but can help a doctor evaluate your risk of kidney disease.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) allows 5 parts of cadmium per billion parts of drinking water (5 ppb). The EPA also limits how much cadmium can enter lakes, rivers, waste sites, and cropland. The EPA does not allow cadmium in pesticides.

The Food and Drug Administration (FDA) limits the amount of cadmium in food colors to 15 parts of cadmium per million parts of food color (15 ppm).

The Occupational Safety and Health Administration (OSHA) now limits workplace air to 100 micrograms (μg) cadmium per cubic meter (m^3) as cadmium fumes and 200 μg cadmium/m^3 as cadmium dust. OSHA is planning to limit all cadmium compounds to either 1 or 5 μg/m^3.

The National Institute for Occupational Safety and Health (NIOSH) currently recommends that workers breathe as little cadmium as possible.

Glossary

Carcinogen: Substance that can cause cancer.
PPM: Parts per million.
PPB: Parts per billion.
Microgram (μg): One millionth of a gram.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for cadmium. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Case studies in environmental medicine: Cadmium toxicity. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns. For more information, contact: Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333, Phone: 404-639-6000.

Chloroform

Chloroform, also know as trichloromethane, is a colorless liquid with a pleasant, non-irritating odor and a slightly sweet taste. Chloroform is used primarily to synthesize other chemicals. Most chloroform found in the environment comes from chemical manufacturing plants, pulp and paper mills, chlorinated drinking water supplies, and chlorination of waste water from sewage treatment plants. Chloroform is highly soluble in water, and it readily evaporates into air where it is ultimately degraded by photochemical reactions. The most likely source of exposure to chloroform is through drinking water and/or breathing air containing chloroform. It also can be absorbed through the skin. Inside the body, chloroform can be transported throughout the body, concentrating mainly in fat tissue, brain, liver, and kidney.

In humans, chloroform has been found to adversely affect the central nervous system (CNS), liver, kidneys, digestive system, heart, and circulatory system after exposure through inhalation or ingestion. CNS effects associated with human exposure to chloroform include dizziness, vertigo, headache, and in some cases death. When used as an anesthetic in the past, chloroform caused irregular heartbeat and low blood pressure. Anesthetic use was discontinued because of liver and kidney damage. Long-term exposure to low concentrations of chloroform also causes liver and kidney damage in humans.

In long-term animal studies, chloroform-induced liver and kidney damage has also been noted. Reproductive effects in mice associated with chloroform inhalation exposure include decreased ability to maintain pregnancy and an increase in birth defects. It is not known whether chloroform can cause similar reproductive effects in humans. The oral RfD of 1E-02 mg/kg-day was derived from a study involving beagle dogs who were administered chloroform in a toothpaste based on gelatin capsules. The inhalation RfD of 1E-03 mg/kg-day was extrapolated from the oral RfD.

Although it is unknown whether long-term exposure contributes to the development of cancer in humans, liver and kidney tumors have been associated with oral exposure in mice and rats. Chloroform is classified as a Group B2, probable human carcinogen, by EPA based on animal studies. The oral slope factor for chloroform, 6.1E-03 mg/kg-day^{-1}, is based on kidney tumor incidence in rats exposed to chloroform in their drinking water. The inhalation slope factor, 8.05E-02 mg/kg-day^{-1}, was developed based on data from a gavage study on mice.

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CHLOROFORM

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about chloroform. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to chloroform happens mostly from breathing contaminated air around waste sites or in the workplace or drinking or contacting contaminated water. Very high amounts of chloroform can damage your central nervous system, liver, and kidneys. Chloroform has been found in at least 646 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is chloroform? (Pronounced klo´ ro-form)

Chloroform is a colorless liquid with a pleasant odor and a slight, sweet taste. It is a naturally occurring compound, but most of the chloroform that gets into our environment is manufactured. It is also called trichloromethane.

Chloroform is used to make other compounds. Small amounts are also formed when chlorine is added to water. Chlorine is used as a disinfectant for sewage treatment plants, drinking water treatment, and in swimming pools and spas. It is also used as a bleach in paper mills.

There are many ways for chloroform to enter the environment, so small amounts are likely to be found almost everywhere.

What happens to chloroform when it enters the environment?

- Chloroform enters the air and water from factories, leaky storage containers, and waste disposal.
- It evaporates very quickly, so it's mostly in air.
- It's a small molecule that dissolves easily in water.
- It can travel through soil to groundwater.
- It breaks down slowly in air (over many months) and very slowly in water (over many years).
- It can remain in groundwater a long time.
- It doesn't build up in plants and animals.

How might I be exposed to chloroform?

- Very low levels in most air and water
- Higher levels from breathing contaminated air or drinking contaminated water around landfills or hazardous waste sites
- Breathing indoor air around heated water
- Breathing contaminated workplace air (industrial or water treatment sites, drinking water treatment plants, waste burning sites, paper and pulp mills)
- From skin contact with contaminated water when swimming or bathing.

How can chloroform affect my health?

The health effects of chloroform are similar whether it is breathed or ingested. The effects of chloroform depend on how much gets in your body.

In large amounts, chloroform may damage your central nervous system, liver, and kidneys.

Exposure to **very high levels** (8,000-10,000 parts of chloroform per million parts of air; 8,000-10,000 ppm) will likely result in unconsciousness and death. Breathing **high levels** in the air (900 ppm) for a short time may cause tiredness, dizziness, or headaches. These levels are several hundred thousand times higher than the background levels in air. Background levels are from 0.02 to 0.05 parts of chloroform per billion parts of air (0.02-0.05 ppb). Background levels in water are from 2-44 ppb.

If you continually breathe air, eat food, or drink water that contains sufficient chloroform, you may damage your liver and kidneys.

When chloroform comes in direct contact with your skin, it can cause sores.

We don't know whether chloroform affects reproduction or causes birth defects in humans.

In animal studies, **moderate amounts** (300 ppm) of chloroform affected reproduction. Male mice had abnormal sperm. Female rats and mice, when exposed to chloroform during pregnancy, aborted their fetuses or had higher numbers of offspring with birth defects.

How likely is chloroform to cause cancer?

The Department of Health and Human Services has determined that chloroform may reasonably be anticipated to be a carcinogen. Human data is lacking, but animal studies showed an increase in liver and kidney cancer from daily eating or drinking over a long time of food and water containing chloroform in the 60-200 ppm range.

Is there a medical test to show whether I've been exposed to chloroform?

Tests are available to measure the amount of chloroform in breath, blood, urine, and body tissues. The tests can't determine how much chloroform you were exposed to or whether you will have any health effects.

These tests must be performed soon after the exposure, because chloroform leaves the body quickly. Since chloroform is a breakdown product of other chemicals, the presence of chloroform in your body might also indicate that you have come into contact with other chemicals.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) limits exposure to total trihalomethanes, which include chloroform, in drinking water to 100 micrograms per liter (µg/L). EPA requires that spills of 10 pounds or more of chloroform be reported to the federal government.

The Occupational Safety and Health Administration (OSHA) sets an occupational exposure limit of 2 ppm for an 8-hour workday for persons who work with chloroform.

Glossary

Carcinogen: Substance that can cause cancer.
Ingestion: Taking food or drink into your body.
Microgram (µg): One millionth of a gram.
PPM: Parts per million.
PPB: Parts per billion.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for chloroform. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

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Chromium

Chromium is a naturally occurring element used industrially in the manufacture of steel and other alloys. Its compounds are used in refractory brick for the metallurgical industry, and in metal plating (chromium VI), the manufacture of pigments (both chromium III and chromium VI), leather tanning (chromium III), and other processes. Exposure to chromium can result from inhalation of air containing chromium-bearing particles and ingestion of contaminated water or food. Chromium is considered an essential nutrient that helps to maintain normal glucose, cholesterol, and fat metabolism. The minimum daily requirement of chromium for optimal health has not been established, but ingestion of 20 to 500 μg/day has been estimated to be safe and adequate.

The two major forms of chromium found in the environment differ in their potential adverse health effects. Chromium VI is an irritant, and short-term, high-level exposure can result in adverse effects at the site of contact, causing ulcers of the skin, irritation and perforation of the nasal mucosa, and irritation of the gastrointestinal tract. Minor to severe damage to the mucous membranes of the respiratory tract and to the skin has resulted from occupational exposure to as little as 0.1 mg/m^3 chromium VI compounds. Chromium VI also may cause adverse effects in the kidney and liver, and long-term occupational exposure to low levels of chromium VI compounds has been associated with lung cancer in humans. Epidemiologic studies of chromate production facilities in the U.S. have identified an association between chromium exposure and lung cancer. The majority of these studies did not attempt to determine whether chromium III or chromium VI compounds were the etiologic agents; however, hexavalent chromium compounds were carcinogenic in animal assays. An inhalation slope factor for chromium VI (4.2E+01 mg/kg-day^{-1}) has been derived based on the incidence of lung cancer among occupationally exposed individuals.

The second form, chromium III (chromium 3$^+$), does not result in these effects and is the form thought to be an essential nutrient. The only effect observed in toxicological studies of chromium III was a decrease in liver and spleen weights in rats.

Oral RfDs have been developed for chromium III and chromium VI. The oral RfD for chromium III (1E+00 mg/kg-day) is based on a chronic rat feeding study in which rats were fed chromic oxide baked in bread at dietary levels of 0, 1, 2, or 5%, 5 days/week for 600 feedings. The oral RfD (5E-03 mg/kg-day) for chromium VI is based on a 1-year drinking study during which rats were supplied with drinking water containing 0 to 11 ppm chromium for 1 year.

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CHROMIUM

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about chromium. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to chromium happens mostly from breathing workplace air, or ingesting water or food from soil near waste sites. Chromium can damage the lungs and cause allergic responses in the skin. Chromium has been found in at least 115 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is chromium? (Pronounced kro′ mē - um)

Chromium is a naturally occurring element found in rocks, soil, plants, animals, and in volcanic dust and gases.

Chromium has three main forms—chromium(0), chromium(III), and chromium(VI). Chromium(III) compounds are stable and occur naturally, in the environment. Chromium(0) does not occur naturally and chromium (VI) occurs only rarely. Chromium compounds have no taste or odor.

Chromium(III) is an essential nutrient in our diet, but we need only a very small amount. Other forms of chromium are not needed by our bodies.

Chromium is used for making steel and other alloys, bricks in furnaces, and dyes and pigments, and for chrome plating, leather tanning, and wood preserving.

What happens to chromium when it enters the environment?

- ❑ Manufacturing, disposal of products or chemicals containing chromium, or burning of fossil fuels release chromium to the air, soil, and water.
- ❑ Chromium particles settle from air in less than 10 days.
- ❑ Chromium sticks strongly to soil particles.
- ❑ Most chromium in water sticks to dirt particles that fall to the bottom; only a small amount dissolves.
- ❑ Small amounts move from soil to groundwater.
- ❑ Fish don't take up or store chromium in their bodies.

How might I be exposed to chromium?

- ❑ *Breathing contaminated workplace air (stainless steel* welding, chromate or chrome pigment production, chrome plating, leather tanning)
- ❑ Handling or breathing sawdust from chromium treated wood
- ❑ Breathing contaminated air, or ingesting water, or food from soil near waste sites or industries that use chromium
- ❑ Very small amounts of chromium(III) are in everyday foods.

How can chromium affect my health?

All forms of chromium can be toxic at high levels, but chromium(VI) is more toxic than chromium(III).

Breathing **very high levels** of chromium(VI) in air can damage and irritate your nose, lungs, stomach, and intestines. People who are allergic to chromium may also have asthma attacks after breathing **high levels** of either chromium(VI) or (III).

Long term exposures to **high or moderate levels** of chromium(VI) cause damage to the nose (bleeding, itching, sores) and lungs, and can increase your risk of non-cancer lung diseases.

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Ingesting very large amounts of chromium can cause stomach upsets and ulcers, convulsions, kidney and liver damage, and even death.

We don't know if chromium harms the fetus or our ability to reproduce. Mice that ingested large amounts of chromium had reproductive problems and offspring with birth defects.

Skin contact with liquids or solids containing chromium(VI) may lead to skin ulcers. Some people have allergic reactions including severe redness and swelling.

How likely is chromium to cause cancer?

The Department of Health and Human Services has determined that certain chromium(VI) compounds are known carcinogens. This is based on increased lung cancer in some workers who were exposed to chromium. Animal studies also indicate chromium(VI) is a carcinogen. We do not have enough data to determine if chromium(0) or chromium(III) are carcinogens.

Is there a medical test to show whether I've been exposed to chromium?

Chromium can be measured in the hair, urine, serum, red blood cells, and whole blood.

Tests for chromium exposure are most useful for people exposed to high levels. These tests cannot determine the exact levels of chromium you were exposed to or predict how the levels in your tissues will affect your health.

Skin patch tests may indicate if you are allergic to chromium.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) sets a maximum level for chromium(III) and chromium(VI) in drinking water of 100 micrograms of chromium per liter of water (100 µg/L).

The Occupational Safety and Health Administration (OSHA) sets limits for an 8-hour workday, 40-hour workweek of 500 micrograms chromium per cubic meter (µg/m^3) for water-soluble chromic [chromium(III)] or chromous [chromium(II)] salts and 1,000 µg/m^3 for metallic chromium [chromium(0)], and insoluble salts. Chromic acid and chromium(VI) compounds in the workplace air should not be higher than 100 µg/m^3 for any period of time.

The National Institute for Occupational Safety and Health (NIOSH) recommends an exposure limit of 500 µg /m3 for chromium(0), chromium(II), and chromium(III) for a 10-hour workday, 40-hour workweek. NIOSH considers all chromium(VI) compounds to be potential occupational carcinogens, and recommends an exposure limit of 1 µg/m^3 for a 10-hour workday, 40-hour workweek.

The National Research Council (NRC) recommends a dietary intake of chromium(III) of 50-200 µg/day. In the United States, severe chromium deficiency is rare, but marginal deficiency may be more common. Chromium(III) is believed to help insulin maintain normal glucose levels.

Glossary

Carcinogen: Substance that can cause cancer.
Ingestion: Taking food or drink into your body.
Microgram (µg): One millionth of a gram.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for chromium. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Case studies in environmental medicine: Chromium toxicity. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

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Copper

Copper is a naturally occurring element that is used to make electrical wiring and water pipes and is a component of alloys such as bronze and brass. Copper compounds are used in gardening supplies to prevent plant disease; in water treatment; and in wood, leather, and fabric preservatives.

Copper may enter the body by inhalation, by ingestion of water or food containing copper, and by dermal contact. Copper is an essential element at low-dose levels but may induce toxic effects at high-dose levels. The National Academy of Sciences has recommended 2 to 3 mg/day of copper as a safe and adequate daily intake. Long-term overexposure to copper dust can irritate the nose, mouth, and eyes and cause headaches, dizziness, nausea, and diarrhea. Ingestion of high concentrations of copper can cause vomiting, diarrhea, stomach cramps, and nausea. Liver and kidney damage and possibly death may occur if exposure continues.

Very young children are particularly sensitive to liver damage from overexposure to ingested copper. In general, the seriousness of health effects of copper increases as the level and duration of exposure increases. Copper is not known to cause cancer or birth defects.

An oral RfD of 3.71E-02 mg/kg-day has been derived for copper based on a single dose LOAEL of 5.3 mg which resulted in gastrointestinal irritation in humans.

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DDT

DDT is a manmade chemical that has been used extensively throughout the world as a broad-spectrum insecticide. Technical grade DDT typically contains 80% to 90% 4,4'-DDT as well as other components including DDD and DDE. Although the agricultural use of DDT in the United States was banned by the EPA in 1972, it is presently widely distributed in the environment as a result of its extensive past use and its high stability and persistence.

Absorption of DDT has been demonstrated following oral, inhalation, and dermal exposure. The primary route of exposure, however, is the oral route. The major adverse effects of DDT appear to involve the nervous system, the liver, and reproduction and development of offspring. In humans, doses of up to 6 mg/kg usually produce no general illness, but headaches, excessive perspiration, and nausea have sometimes been reported. Vomiting due to nervous system effects rather than gastrointestinal irritation has been reported in humans after DDT exposure to higher doses. Convulsions occur at about 16 mg/kg. At lower doses (250 mg), noted effects are limited to prickling sensations on the tongue and mouth. Intermediate doses (750 mg) were reported to produce sensitivity of the lower part of the face; uncertain gait; cold, moist skin; and hypersensitivity to contact. A dose of 1,500 mg produced prickling of the mouth and nose, disturbance of equilibrium, dizziness, confusion, tremors, malaise, headache, fatigue, and severe vomiting. All of the human volunteers orally exposed to DDT at doses of 250 to 1,500 mg recovered within 24 hours. An oral RfD of 5E-04 mg/kg-day has been developed based on the occurrence of liver lesions in rats exposed to DDT in a 27-week feeding study. Although there is insufficient evidence to classify DDTa carcinogen based on human studies, it has been found to be carcinogenic in a number of animal studies, primarily producing liver tumors. EPA classifies DDT as Group-B2, probable human carcinogens. Oral and inhalation slope factors (3.4E-1 mg/kg-day^{-1}) are based on the increased incidence of benign and malignant liver tumors in mice and rats exposed to DDT in their diets.

Diazinon

Diazinon is a non-systemic organophosphate insecticide which is used on rice, fruit trees, vineyards, sugarcane, corn, tobacco, potatoes, and horticultural crops, and in pest control strips. Diazinon strongly binds to soil and exhibits moderate mobility in the soil. The persistence of diazinon applied at recommended rates is reported to be 10 to 12 weeks in most soils. Evaporation from surface soils is not expected to be significant. Diazinon may sorb to sediments but is not expected to bioconcentrate in aquatic organisms. Volatilization of diazinon from surface waters may be an important transport process.

Organophosphate insecticides are neurotoxins which interfere with the metabolism of acetylcholine. Exposure to diazinon may produce a broad-range of clinical effects including feelings of headache, weakness, dizziness, blurred vision, psychosis, respiratory difficulty, paralysis, convulsions, and coma. Clinical manifestations of organophosphate poisoning usually occur within 12 hours of exposure.

The oral RfD, 9E-04 mg/kg-day, is based on decreased cholinesterase activity in rats exposed to diazinon in their diet for 35 to 42 days.

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1,4-Dichlorobenzene (1,4-DCB)

1,4-DCB is used as an intermediate in chemical manufacturing, as a metal polishing agent, and in industrial odor control; additionally, it is used as an insecticide and disinfectant. Human exposure is most likely to occur through the inhalation of air and ingestion of food and drinking water containing 1,4-DCB. 1,4-DCB is rapidly absorbed by humans via the lungs and gastrointestinal tract and metabolized; it also is absorbed through the skin. The major target organs include the liver, the blood forming tissue, and the central nervous system. Most of the toxic effects of the dichlorobenzene result from exposure to 1,2-DCB and 1,4-DCB.

Although there is no evidence that 1,4-DCB can cause cancer in humans, increased incidence of cancer has been observed in laboratory animals treated with 1,4-DCB in lifetime studies. At present, 1,4-DCB is classified as a Group C, possible human carcinogen.

The inhalation RfD (2.29E-01 mg/kg-day) is derived from an RfC of 8E-01 mg/m^3. The RfC is based on increased liver weights in a multigeneration reproductive study of male rats. An oral slope factor (2.4E-02 $mg/kg\text{-}day^{-1}$) also has been derived based on liver tumors observed during a gavage study on mice.

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1,4-DICHLOROBENZENE

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about 1,4-dichlorobenzene. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to 1,4-dichlorobenzene happens mostly from breathing high levels in indoor air or workplace air. Extremely high exposures can cause dizziness, headaches, and liver problems. 1,4-Dichlorobenzene has been found in at least 244 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is 1,4-dichlorobenzene? (Pronounced di-klo″ro-ben′zēn)

1,4-Dichlorobenzene is a chemical used to control moths, molds, and mildew, and to deodorize restrooms and waste containers. It is also called para-DCB or p-DCB. Other names include Paramoth, para crystals, and paracide reflecting its widespread use to kill moths.

At room temperature, p-DCB is a white or colorless solid with a strong, pungent odor. When exposed to air, it slowly changes from a solid to a vapor. It is the vapor that acts as a deodorizer or insect killer.

Most people recognize the odor as the smell of mothballs, and can smell p-DCB in the air at very low levels.

Most p-DCB in our environment comes from its use in moth repellent products and in toilet deodorizer blocks.

What happens to 1,4-dichlorobenzene when it enters the environment?

- ❑ In air, it breaks down to harmless products in about a month.
- ❑ It does not dissolve easily in water.
- ❑ It evaporates easily from water and soil, so most is found in the air.
- ❑ It is not easily broken down by soil organisms.
- ❑ It is taken up and retained by plants and fish.

How might I be exposed to 1,4-dichlorobenzene?

- ❑ Breathing indoor air in public restrooms and homes that use p-DCB as a deodorizer
- ❑ Breathing air around some mothballs (check the label)
- ❑ Breathing workplace air where p-DCB is manufactured
- ❑ Drinking contaminated water around hazardous waste sites
- ❑ Eating foods such as pork, chicken, and eggs that are contaminated with p-DCB from its use as an odor control product in animal stalls
- ❑ Eating fish from contaminated waters
- ❑ Infants can be exposed by drinking human breast milk from mothers exposed to p-DCB.

How can 1,4-dichlorobenzene affect my health?

There is no evidence that moderate use of common household products that contain p-DCB will result in harmful effects to your health. Harmful effects, however, may occur from high exposures.

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Very high usage of p-DCB products in the home can result in dizziness, headaches, and liver problems. Some of the patients who developed these symptoms had been using the products for months or even years after they first began to feel ill.

Workers breathing **high levels** of p-DCB (1,000 times more than levels in deodorized rooms) have reported painful irritation of the nose and eyes.

There are cases of people who have eaten p-DCB products regularly for months to years because of the sweet taste. These people had skin blotches and lower numbers of red blood cells.

There is no direct evidence that p-DCB can cause birth defects or affect reproduction in humans.

Animal studies indicate that breathing or eating p-DCB can harm the liver, kidney, and blood.

We have no studies on the health effects from skin contact with p-DCB.

How likely is 1,4-dichlorobenzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that p-DCB may reasonably be anticipated to be a carcinogen.

There is no direct evidence that p-DCB can cause cancer in humans,. However, animals given very high amounts in water developed liver and kidney tumors.

Is there a medical test to show whether I've been exposed to 1,4-dichlorobenzene?

Tests are available to measure your exposure to p-DCB. The most common test measures a breakdown product of p-DCB called 2,5-dichlorophenolurine. It is measured in the urine and blood.

If there is 2,5-dichlorophenol in the urine, it indicates that the person was exposed to p-DCB within the previous day or two. The test that measures p-DCB in your blood is less common.

These tests require special equipment not routinely available in a doctor's office. You or your doctor will need to send samples to a special laboratory.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) lists p-DCB as a hazardous waste to be regulated. The EPA sets a maximum level of 75 micrograms of p-DCB per liter of drinking water (75 µg/L). One µg is one million times less than a gram. p-DCB is also an EPA-registered pesticide. Manufacturers must provide certain information to EPA for it to be used as a pesticide.

The Occupational Safety and Health Administration (OSHA) sets a maximum level of 75 parts of p-DCB per million parts air in the workplace (75 ppm) for an 8-hour day, 40-hour workweek.

Glossary

Carcinogen: Substance that can cause cancer.

Ingestion: Taking food or drink into your body.

Microgram (µg): One millionth of a gram.

PPM: Parts per million.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for 1,4-dichlorobenzene. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

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1,1-Dichloroethene (1,1-DCE)

1,1-DCE is a man-made chemical that does not occur naturally in the environment. It is a clear, colorless liquid that has a mild, sweet, chloroform-like odor. 1,1-DCE is used to make plastic products such as Saranwrap and flame-retardant fabrics.

High levels of exposure to 1,1-DCE can occur among workers plants making or using this chemical. Low levels of 1,1-DCE have been detected in the environment. 1,1-DCE can be detected at background levels of less than 1 part per million in indoor and outdoor air. Higher concentrations of 1,1-DCE have been found in air near factories that make or use 1,1-DCE and some chemical waste sites. Surveys of U.S. drinking water supplies have found a small percentage of that contain detectable 1,1-DCE.

1,1-DCE usually enters the body via inhalation and/or ingestion. It may also enter the body through the skin. The human health effects resulting from exposure to 1,1-DCE are unknown. In animal studies, brief exposures to high concentrations of 1,1-DCE have caused liver, kidney, heart, and lung damage; nervous system disorders; and death. Prolonged exposure to lower concentrations of 1,1-DCE also has produced liver damage. The oral RfD for 1,1-DCE, 9E-03 mg/kg-day, was derived from a chronic bioassay for rats in which hepatic lesions were identified as the critical effect. Oral and inhalation slope factors also have been derived for 1,4-DCE.

An increased risk for cancer was observed in one study of animals exposed to 1,1-DCE, although most studies do not indicate an increased cancer risk. Based upon this one positive study, 1,1-DCE is classified as a Group C possible human carcinogen. The oral slope factor (6E-01 mg/kg-day^{-1}) is developed based on adrenal pheochromocytomas in male rats exposed to 1,4-DCE in their drinking water. The inhalation slope factor (1.75E-01 mg/kg-day^{-1}) is based on kidney adenocarcinomas in mice.

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Dioxins

2,3,7,8-TCDD, a polychlorinated dibenzodioxin (PCDD) isomer, is currently regarded as representing the highest potential human health risk. PCDDs have not been deliberately produced or released to the environment. Rather they are unwanted trace contaminants formed during the production or combustion of chlorinated organic compounds, most notably: polychlorinated phenols; polychlorinated biphenyls; and 2,4,5-trichlorophenoxyacetic acid formulations. Other sources include municipal solid waste incinerators, hazardous waste incinerators, copper smelters, steel mills, pulp and paper mills, and automobile exhaust. They also may be produced by a variety of natural combustion processes. 2,3,7,8-TCDD is the most intensely studied of the PCDDs and is the reference chemical by which the relative toxicity of other PCDDs and polychlorinated dibenzofurans (PCDFs) is measured.

2,3,7,8-TCDD is susceptible to photodecomposition but is generally resistant to other chemical degradation in the environment. Typical half-lives for phototransformation of TCDD in aqueous environmental systems range from 1.77 days in summer to 5.42 days in winter (Choudhry and Webster 1986). Given the high K_{oc}s and log K_{ow}s, 2,3,7,8-TCDD is expected to be strongly absorbed into soil particles. 2,3,7,8-TCDD is strongly adsorbed to soil particles, and aqueous leaching is expected to be minimal (DiDomenico and Vivano 1982; Wipf and Schmid 1981). Transport of TCDD-contaminated soil into surface waters by erosion has been described by various authors (Thibodeaux 1983; 1980). 2,3,7,8-TCDD is expected to remain strongly adsorbed and persist in the suspended sediment or bottom sediment of surface waters.

Following oral administration in a human volunteer, Poiger and Schlatter (1986) estimated that approximately 90% of the body burden was sequestered in the fat. In this study, which lasted 135 days, elevated radioactively-labeled TCDD remained in the blood only during the initial two days following treatment. 2,3,7,8-TCDD and its metabolites are eliminated predominantly in the feces and the urine in an apparent first-order process (ATSDR 1988). Elimination half-lives were 22 to 30 days for guinea pigs, 17 to 31 days for rats, and 11 to 24 days for mice (11 days in response mice and 24 days in nonresponsive mice). No reported deaths in humans were identified in the available literature following acute exposure to 2,3,7,8-TCDD (ATSDR 1988). Extensive acute lethality studies indicate that the chemical is toxic at very low levels in all animal species tested.

Four major toxic effects characteristic of 2,3,7,8-TCDD exposure in animal and/or humans are chloracne, the wasting syndrome, hepatotoxicity, and immunotoxicity. Chloracne is the only lesion definitively identified in humans exposed to 2,3,7,8-TCDD. Human data are insufficient to evaluate the dose-response relationship in humans directly. However, a

single dose of 70 μg/kg or a dose of approximately 0.01 μg/kg/day in a 7-month feeding study in monkeys produced chloracne (McConnell *et al.* 1978; Allen *et al.* 1977). The wasting syndrome, which has been observed in animal studies only, is characterized by extreme loss of body weight. This syndrome has been observed in both acute and longer-term studies and is most commonly associated with lethal doses.

2,3,7,8-TCDD is hepatotoxic in all species tested, with the severity of the lesions being highly species-dependent. Immunotoxicity, based upon numerous animal studies, is one of the most sensitive toxicological endpoints for 2,3,7,8-TCDD. Immunotoxicity data in humans are extremely limited.

There have been no reports of reproductive or developmental toxicity in humans but the fetus, in all animal species tested, is highly sensitive to the toxic effects of 2,3,7,8-TCDD. Effects such as hemorrhage, edema, kidney abnormalities, cleft palate, and hydronephrotic kidneys have been reported in mice and rats exposed to 2,3,7,8-TCDD.

2,3,7,8-TCDD has been shown to be a carcinogen in rats and mice in a National Toxicology Program bioassay and in rats in a 2-year bioassay by Kociba *et al.* (1978a, b). EPA has reviewed TCDD-related epidemiological studies and judged them to be insufficient on methodological and statistical grounds, for directly evaluating carcinogenicity of the chemical in humans. Based upon the positive bioassay data, EPA has categorized the chemical in Group B2, probable human carcinogen.

There is neither a validated bioassay for evaluating the toxicity of complex mixtures of PCDDs and PCDFs nor complete sets of toxicological data for each constituent PCDD or PCDF congener (EPA 1989). Consequently, as an interim science policy measure, EPA has developed a procedure for estimating the toxic risks of these mixtures using the distributions and concentrations of individual isomers and/or of isomers with the same number of chlorine substituents, as well as the estimated relative toxicity of these compounds. These procedures generate 2,3,7,8-TCDD toxicity equivalency factors (TEFs) of complex mixtures based on isomer-specific data. 2,3,7,8-TCDD equivalents are defined as the concentration of 2,3,7,8-TCDD which by itself would be believed to exhibit the same biological potency as the mixture of structurally related compounds, PCDD/PCDFs, actually present in a sample.

Oral and inhalation slope factors have been developed for dioxin. The oral and inhalation slope factors ($1.5E+05$ mg/kg-day^{-1}) are based on liver and respiratory system tumors in rats exposed to dioxin in their diet for 720 days.

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Lead

Because a large scientific database exists for toxicological effects related to lead poisoning in children and adults, a detailed toxicological profile is presented below.

Pharmacokinetics of Lead

Absorption

The gastrointestinal absorption of dietary lead is greater in infants and children than in adults. In young children, absorption of inorganic lead is approximately 50% as compared to 8 to 15% absorption in adults (ATSDR 1990). A mass balance study in infants (ages 2 weeks to 2 years) yielded estimates for absorption of 42% for children with dietary intakes of ≥ 5 μg of lead per kilogram of body weight (μg Pb/kg bw). Lower dietary intakes were associated with highly variable absorption values (Ziegler *et al.* 1978). A study conducted with infants and children (ages 2 months to 8 years with daily intake of 10 μg Pb/kg bw) yielded estimates of 53% for gastrointestinal absorption (Alexander *et al.* 1973).

The extent of lead absorption depends upon several factors, including the solubility of a given lead compound and upon dietary factors. In the presence of food the absorption of ingested nonfood media is decreased. When the diet is low or deficient in calcium, copper, iron, zinc, phosphate, vitamin D, protein, or fiber, or has high lipid content, increased gastrointestinal absorption of lead may occur. Therefore, individuals with poor nutritional status may absorb more lead from environmental sources (CDC 1991).

On the average, approximately 32% of the inhaled particulate lead is absorbed by young children (ATSDR 1990). Larger particles are cleared by ciliary action to the gastrointestinal tract. Although relatively little is known about the absorption of airborne lead in children because of the lack of data on the pediatric inhalation of particles, extrapolations have been made from adults. In adults, studies show that only the smallest airborne particles reach the lower lung alveolar tissues, whereas larger particles (greater than about 3 microns) are cleared by ciliary action to the gastrointestinal tract. Once deposited in the lower respiratory tract, lead is virtually 100% absorbed into the blood, regardless of its chemical form.

Dermal absorption of inorganic lead compounds in humans is considered to be much less significant than absorption by the oral or inhalation routes.

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Distribution

Once absorbed, inorganic lead is distributed in essentially the same manner regardless of the route of absorption (Hammond 1982). Lead is dispersed, although not uniformly, among several physiologically distinct compartments: the blood, the bone, and the soft tissues. The bone component contains about 95% of the total lead content in adults (about 73% in children). Lead remains bound to bone tissue for decades, with the amount of lead in this compartment increasing throughout the lifetime of an exposed person. The second compartment, the blood, has a half retention time for lead of about 36 days in adults, but possibly as much as 10 months in a 2-year-old child (ATSDR 1990). Approximately 99% of the lead in the blood pool is bound to the hemoglobin in the erythrocytes. A third compartment includes the soft tissues and bone marrow, where retention is about 40 days. Inside the body, lead in these pools is capable of being transferred from one pool to another depending on non-equilibrium conditions. For example, increased mobilization of lead from human bone can occur during the physiological stresses of aging, pregnancy, and lactation. Several studies found that women living in a smelter region had higher blood lead levels during pregnancy and during lactation (ATSDR 1990).

Several pharmacokinetic models have been developed for lead to explain and predict the intercompartmental exchange rates, retention in the various lead pools in the body, and distribution of lead among tissue groups. These predictions are the basis for the EPA IEUBK model which is used in this document to estimate potential lead uptake for young children at the site.

Metabolism of Lead

Inorganic lead has no known physiologic value and is not "metabolized" by the body. It is absorbed, distributed, and eventually eliminated (Hammond 1982). During its residence time within the body, lead interferes with the essential functions of specific enzymes.

In contrast to inorganic lead, the common alkyl lead compounds, which are found as additives in some gasolines, are metabolized by the body. Dealkylation in the liver decomposes these additives to their organic components and inorganic lead. Organic lead compounds are readily absorbed and are considerably more toxic to humans than the inorganic lead compounds; however, they are not a concern at this site and will not be discussed further.

Transplacental Transfer

There is no metabolic barrier to the uptake (absorption) of lead by the fetus (ATSDR 1990). In a Scottish study of 236 mothers and infants, the geometric mean blood lead levels in mothers was 14 μg/dL and 12 μg/dL for their infants (Moore *et al.* 1982). Fetal uptake of lead begins at about the twelfth week of development and increases thereafter throughout the 9-month gestation period. Highest lead levels were measured in fetal bone, kidney, and liver tissues; fetal brain tissues contained lesser amounts of lead (ATSDR 1990).

Lead Accumulation with Age

Bone lead levels are known to increase as a function of age. In men 60 to 70 years old, the total lead content may be >200 mg, while in children (<16 years old) skeletal levels of 8 mg have been measured. Soft tissues including brain tissues do not apparently accumulate lead beyond the levels typically present at 20 years of age (ATSDR 1990).

Elimination

Dietary lead not absorbed by the gastrointestinal tract is eliminated in the feces. Airborne lead that has been swallowed and not absorbed is eliminated in a similar manner. Absorbed (systemic) lead that is not retained by the body is excreted mainly in the urine or into the gastrointestinal tract through biliary clearance. Small amounts of absorbed lead are also eliminated in mother's milk; sweat; hair; nails; and, in cases of pregnancy, the fetus.

Young children (<2 years of age) have been shown to retain 34% of the absorbed lead they are exposed to, whereas adults retained 1% (ATSDR 1990).

Lead Toxicology

Adverse Health Effects

The interfering effects of lead in humans are broad, prompting the Centers for Disease Control (CDC 1991) to issue the statement that "Lead is a poison that affects virtually every system in the body," including the following in young children and the unborn:

- The developing brain and nervous system of fetuses;
- Hemoglobin synthesis;
- Vitamin D metabolism;
- Nerve conduction velocity;

- Intelligence quotient (IQ) and cognitive development;
- Hearing acuity; and
- Growth.

Levels of lead poisoning are commonly equated with internal blood lead levels. Therefore, the following adverse health effects are discussed in terms of the associated blood lead levels or ranges thereof, expressed as micrograms of lead per deciliter of blood (μg/dL).

Figure S.D-1 indicates the effect levels of inorganic lead in children in relation to blood lead levels. For example, the lowest lead level associated with comas, convulsions, and death was about 125 μg/dL; with encephalopathy 90 μg/dL; and with intelligence quotient (IQ), hearing, and growth possibly below the 10 μg/dL level.

The blood lead levels and specific effects shown in Figure S.D-1 summarize the results of multiple, well-reviewed studies, by various authors, which adequately demonstrate the effect. The indicated blood lead concentrations may not be the lowest concentrations that induce the effects. It is also important to note that these and other effects are not based upon animal data or upon data extrapolated to children from occupational exposures. Rather, they are based on case histories and longer-term studies with general emphasis on lead poisoning in the young child.

Selected Key Studies of Low-Level Lead Effects in Young Children

Many of the studies of central nervous system effects are based on recent epidemiological and scientific work designed to detect symptoms at low (less than about 15 μg/dL) lead exposures (CDC 1991). Blood lead levels as low as 10 μg/dL, which do not result in overt, directly observable symptoms, are associated with decreased intelligence and impaired neurobehavioral development (Davis and Svendsgaard 1987; Mushak *et al.* 1989).

Several well-designed and carefully conducted cross-sectional and retrospective cohort studies have been conducted and provide evidence for concern of the effects of low-level lead concentrations on the central nervous system. Blood lead levels and corresponding IQ scores were correlated by CDC as shown in Figure S.D-2, which summarizes 14 key cross-sectional and retrospective cohort studies. These studies show a general decline in IQ scores with increasing blood lead levels. Some inconsistencies can be found in the results, for example the Lansdown *et al.* (1986) studies, but the weight-of-evidence clearly supports the hypothesis that decrements in children's cognition are associated with blood lead levels well below 25

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μg/dL. Socioeconomic status is apparently not an important factor since declines are evident at all IQ levels. Conspicuously absent, however, are any lead-exposed children who achieve superior function; i.e., IQ scores greater than 125. No lowest lead concentration threshold associated with an initial decline in IQ is observed from the data (CDC 1991).

An important pioneering study of a general population of children without known elevated lead exposure was conducted by Needleman *et al.* (1979). The deciduous teeth of subjects were analyzed for lead content, which served as an indicator of cumulative lead exposure for the more than 2,000 children enrolled in the study. Based on classroom teacher rating of the behavior of these children, an apparent dose-response relationship was found. More detailed analyses, taking into account various confounding variables, showed significant differences in IQ and certain other neurobehavioral measures for 58 high-lead children versus 100 low-lead children. Figure S.D-3 is a cumulative frequency distribution of verbal IQ scores for children in the high (12 to 26 μg/dL) and low (< 12 μg/dL) groups. A shift in mean IQ score of 4 to 6 points as a result of lead exposure was associated with a substantial increase in the prevalence of children with severe deficits (i.e., IQ score < 80) and a corresponding absence of children who achieved superior function (i.e., IQ scores > 125).

In follow-up studies, Needleman reported that educational success for tested first- and second-graders is inversely associated with the amount of lead in their teeth (Needleman and Gatsonis 1990). Dentine lead levels greater than 20 mg/kg were associated with:

- A seven-fold higher risk of not graduating from high school;
- A six-fold higher risk of having a reading disability;
- Deficits in vocabulary;
- Problems with attention and fine motor coordination;
- Greater absenteeism; and
- Lower (school) class ranking.

In five additional key studies (CDC 1991), prenatal exposures to low lead levels have been associated with slower sensory-motor and delayed early cognitive development. It was noted that a decline in preschool-age children's cognitive performance was associated with early postnatal lead exposures. Lead exposure to the infants ceased after the postnatal period, but declines in sensory-motor and cognitive learning effects persisted.

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Levels of Concern for Lead Toxicity

Figure S.D-4 shows that the accepted level of concern associated with blood lead measurements in children has dropped four-fold during the past 20 years based on the results of additional scientific studies.

The most recent CDC position presented in the statement on "Preventing Lead Poisoning in Young Children" is that there is substantial evidence for the need to reduce children's blood lead levels to 10 μg/dL or lower (CDC 1991). CDC states:

> "The goal of all lead poisoning prevention activities should be to reduce children's blood lead levels below 10 micrograms of lead per deciliter of blood (μg/dL)."
>
> "... the scientific evidence showing that some adverse effects occur at blood lead levels at least as low as 10 μg/dL in children has become so overwhelming and compelling that it must be a major force in determining how we approach childhood lead exposure."

Currently, EPA provides neither a reference dose (RfD) for evaluating the noncarcinogenic effects nor a slope factor (SF) for evaluating any possible carcinogenic effects of lead. EPA (1994c) states that some of the health effects of lead, particularly changes in the levels of certain blood enzymes and effects on children's neurobehavioral development, occur at blood lead levels so low as to be essentially without a threshold. EPA's RfD Work Group, therefore, considers it inappropriate to develop an RfD for inorganic lead (EPA 1994a).

EPA recommends the use of the IEUBK Momel as a risk assessment tool to predict blood lead levels resulting from multiple pathways of lead exposure and to aid in the decision on soil lead cleanup levels at Superfund sites characterized as residential (1994b, c). The IEUBK model estimates the blood lead concentrations in children expected to result from exposure to lead concentrations in soil, as well as from a number of other media (air, water, diet, dust, and paint, 1994bc). The IEUBK model uses the total lead uptake calculated from the estimated intakes of lead in these media to predict the mean blood lead level for children six years old or younger. The distribution of blood lead levels in a population is approximately log normal and is defined by the geometric mean and the geometric standard deviation (GSD). Using the mean and an estimated GSD, the model calculates a frequency distribution for blood lead levels. The frequency distribution is then used to estimate the percentage of the population or the probability of an individual having a blood lead level exceeding a target concentration. EPA has recommended a model projection benchmark of either 95% of the

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sensitive population having blood lead levels at or below 10 μg/dL or a 95% probability of an individual having a blood lead level at or below 10 μg/dL (EPA 1994b, c).

Uncertainty in the CDC Level of Concern

Confidence in the CDC level of concern (≤ 10 μg/dL) is high because many studies specific to young children support the level. The results of separate studies done in the United States, Europe, the British Isles, and in Australia converge at similar blood lead levels for specific low-level effects associated with childhood lead poisoning.

The prospective studies of the early 1980s designed to track low-lead exposures in selected young children (prenatal to early school-age) have been a major influence in the CDC's decision to lower the level of concern to ≤ 10 μg/dL. These prospective studies, which evaluated early cognitive learning development and sensory-motor skills at various exposures to lead in young children, have overcome limitations in earlier cross-sectional studies. These studies now possess reasonable power needed to statistically differentiate between effect and no-effect levels at blood lead concentrations below 10 μg/dL.

The results of these studies indicate that no threshold (lowest level for the onset of adverse effects) has been determined for exposure to lead. The ≤ 10 μg/dL level of concern selected by the CDC may therefore not be protective of all children.

Lead and Cancer

EPA classifies lead as a B2 (probable human) carcinogen based on inadequate evidence of carcinogenicity in humans but sufficient evidence in animals (EPA 1994a). However, most of the investigations in animals found a carcinogenic response only at the highest dose administered. EPA notes that quantifying the cancer risk for lead involves many uncertainties, some of which may be unique to lead. Consequently, the agency's Carcinogen Assessment Group currently recommends against the use of a numerical estimation for carcinogenic potency (EPA 1994a).

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ATSDR

LEAD

Agency for Toxic Substances and Disease Registry April 1993

This fact sheet answers the most frequently asked health questions about lead. For more information, you may call 404-639-6000. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to lead happens mostly from breathing workplace air or dust, and eating contaminated foods. Children can be exposed from eating lead-based paint chips, or playing in contaminated soil. Lead can damage the nervous system, kidneys, and the immune systems. Lead has been found in at least 922 of 1,300 National Priorities List sites identified by the Environmental Protection Agency.

What is lead? (Pronounced led)

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. It has no special taste or smell. Lead can be found in all parts of our environment. Most of it came from human activities like mining, manufacturing, and the burning of fossil fuels.

Lead has many different uses, most importantly in the production of batteries. Lead is also in ammunition, metal products (solder and pipes), roofing, and devices to shield x-rays.

Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When released to the air from industry or burning of fossil fuels or waste, it stays in air about 10 days.
- Most of the lead in soil comes from particles falling out of the air.
- City soils also contain lead from landfills and leaded paint.
- Lead sticks to soil particles.
- It does not move from soil to underground water or drinking water unless the water is acidic or "soft."
- It stays a long time in both soil and water.

How might I be exposed to lead?

- Breathing workplace air (lead smelting, refining, and manufacturing industries)
- Eating lead-based paint chips
- Drinking water that comes from lead pipes or lead soldered fittings
- Breathing or ingesting contaminated soil, dust, air, or water near waste sites
- Breathing tobacco smoke
- Eating contaminated food grown on soil containing lead or food covered with lead-containing dust
- Breathing fumes or ingesting lead from hobbies that use lead (leaded-glass, ceramics).

How can lead affect my health?

Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature

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births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common after exposure to **high levels** of lead.

In adults, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can cause abortion and damage the male reproductive system. The connection between these effects and exposure to **low levels** of lead is uncertain.

How likely is lead to cause cancer?

The Department of Health and Human Services (DHHS) has determined that lead acetate and lead phosphate may reasonably be anticipated to be carcinogens based on studies in animals. There is inadequate evidence to clearly determine lead's carcinogenicity in humans.

Is there a medical test to show whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your exposure to lead. Blood tests are commonly used to screen children for potential chronic lead poisoning. The Centers for Disease Control and Prevention (CDC) considers children to have an elevated level of lead if the amount in the blood is at least 10 micrograms per deciliter (10 µg/dL). Lead in teeth and bones can be measured with X-rays, but this test is not as readily available.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends all children be screened for lead poisoning at least once a year. This is especially important for children between 6 months and 6 years old.

The Environmental Protection Agency (EPA) requires lead in air not to exceed 1.5 micrograms per cubic meter (1.5 $\mu g/m^3$) averaged over 3 months. The sale of leaded gasoline will be illegal as of December 31, 1995. EPA limits lead in drinking water to 15 µg per liter.

The Consumer Product Safety Commission (CPSC), EPA, and the states control the levels of lead in drinking water coolers. Water coolers that release lead must be recalled or repaired. New coolers must be lead-free. Drinking water in schools must be tested for lead.

The Department of Housing and Urban Development (HUD) requires that federally funded housing and renovations, public housing, and Indian housing be tested for lead-based paint hazards. Hazards must be fixed by covering the paint or removing it.

The Occupational Safety and Health Administration (OSHA) limits the concentration of lead in workroom air to 50 $\mu g/m^3$ for an 8-hour workday. If a worker has a blood lead level of 40 µg/dL, OSHA requires that worker to be removed from the workroom.

Glossary

Carcinogenicity: Ability to cause cancer.
Anemia: Low numbers of red blood cells or hemoglobin.
Ingesting: Taking food or drink into your body.
Microgram (µg): One millionth of a gram.

References

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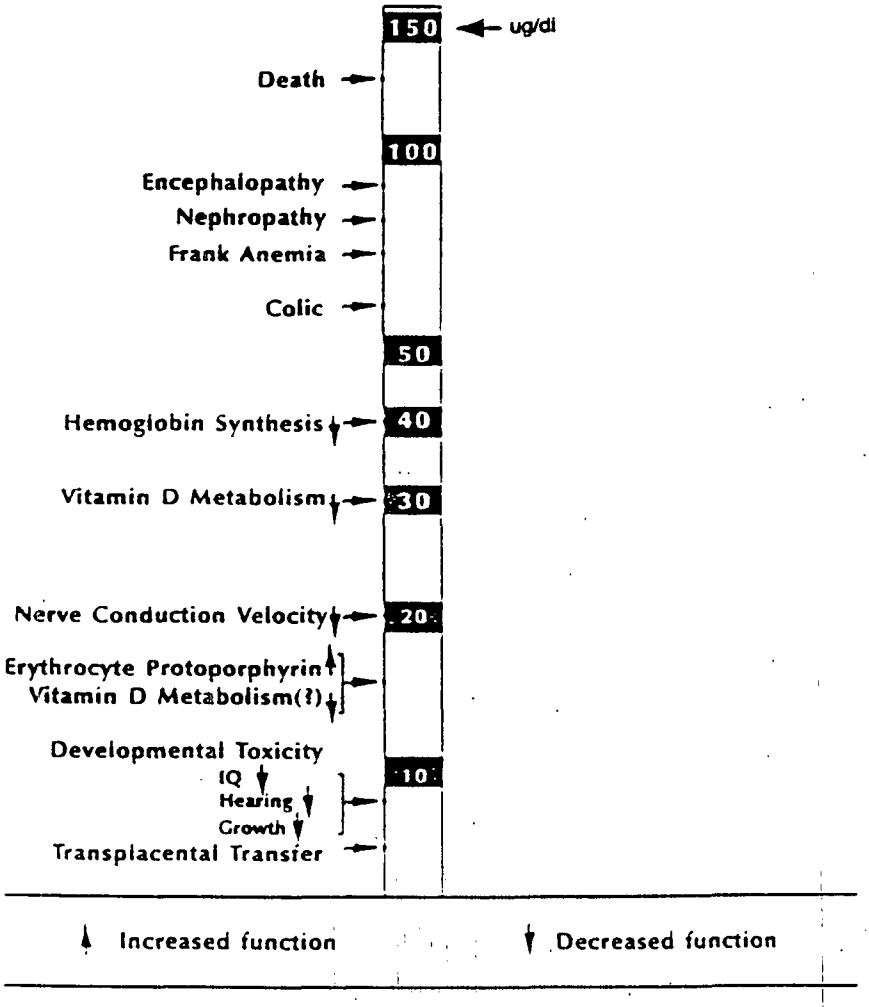
Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Case studies in environmental medicine: Lead toxicity. Atlanta: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

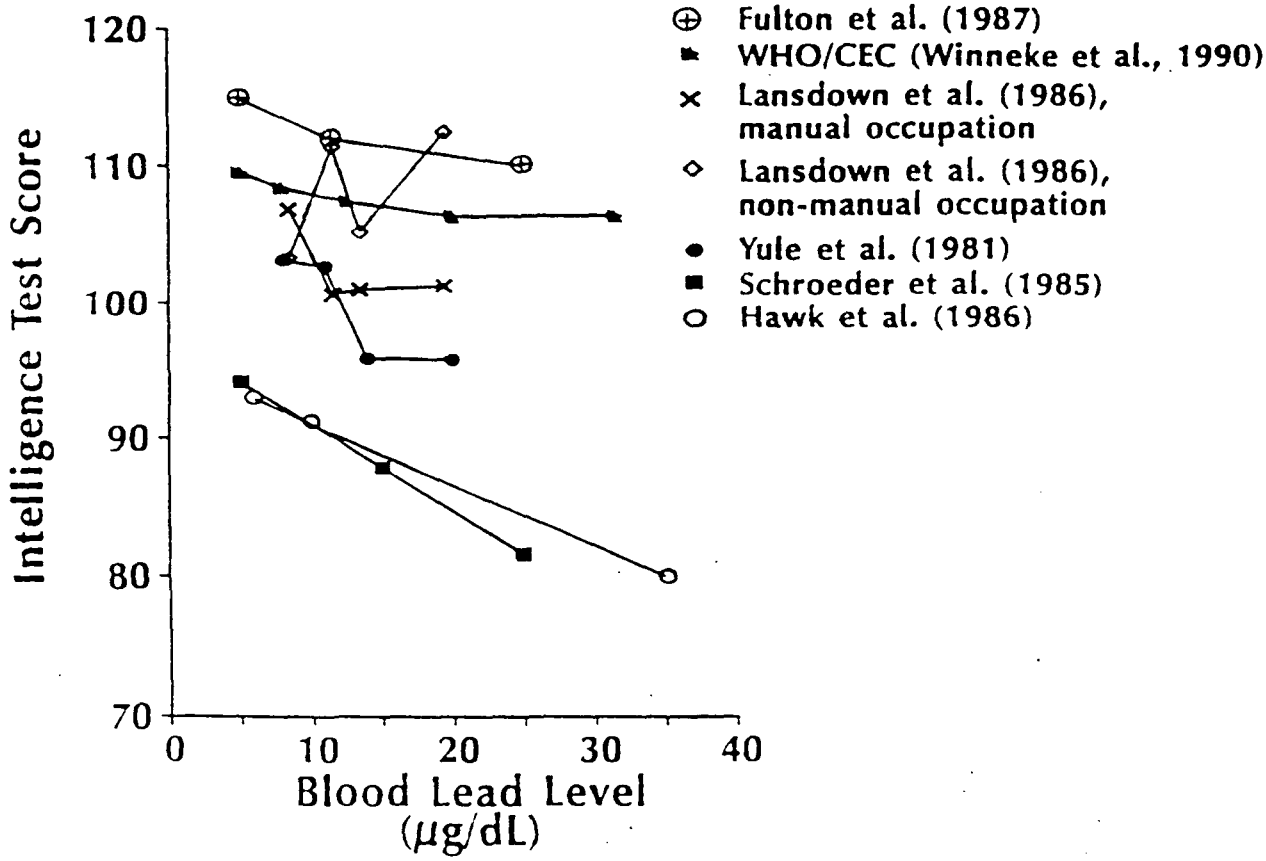
ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns. For more information, contact: Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333, Phone: 404-639-6000.



*NOTE: The levels in this diagram do not necessarily indicate the lowest levels at which lead exerts an effect. These are the levels at which studies have adquately demonstrated an effect.

Source: ATSDR 1990, CDC 1991

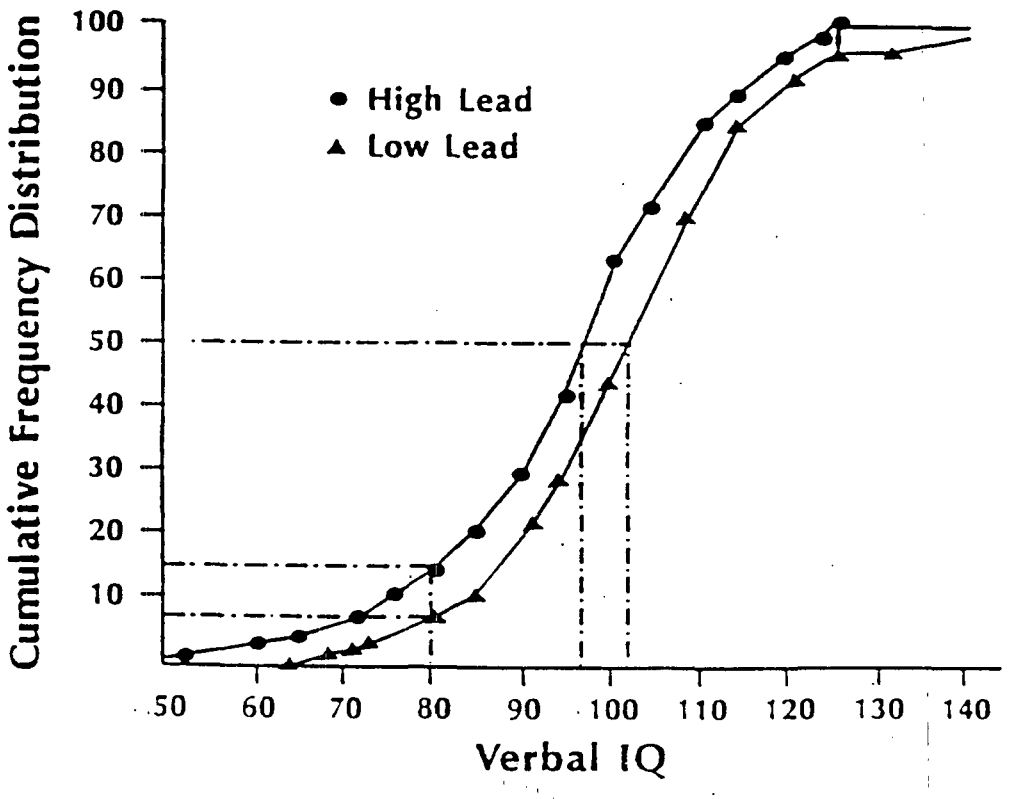
Figure SD-1
LOWEST OBSERVED BLOOD LEVELS
OF INORGANIC LEAD IN CHILDREN*



Source: CDC 1991

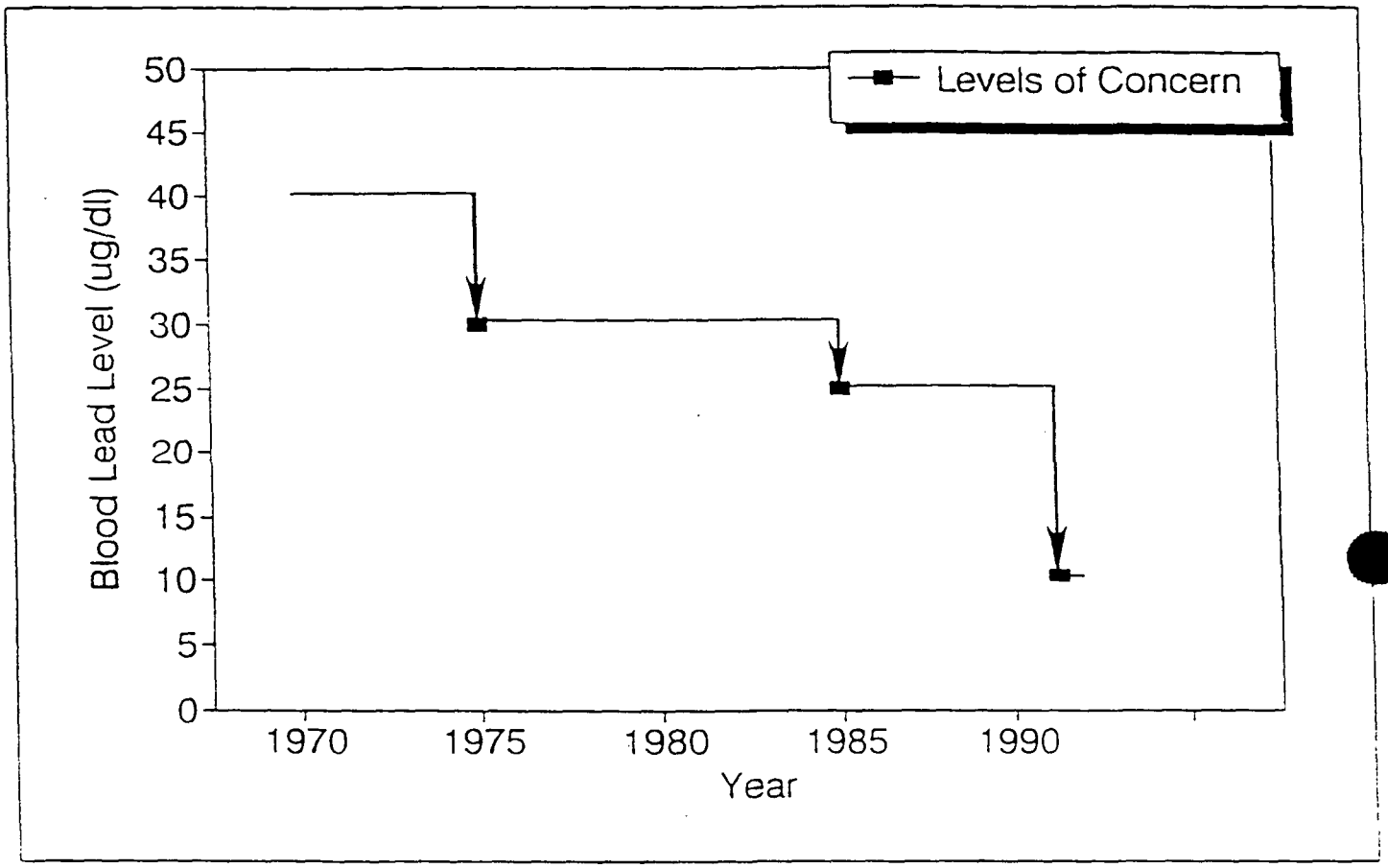
*Data from prospective studies not included

Figure SD-2
BLOOD LEAD LEVELS AND IQ SCORES
OF CHILDREN FROM CROSS-SECTIONAL AND
RETROSPECTIVE COHORT STUDIES*



Source: Needleman et al, 1979

Figure SD-3
CUMULATIVE FREQUENCY DISTRIBUTION OF VERBAL IQ SCORES
IN CHILDREN WITH HIGH AND LOW TOOTH LEAD LEVELS



Note: Decisions made in 1975, 1985, and 1991 (see arrows) to drop the blood lead levels of concern

Figure SD-4
THE CENTERS FOR DISEASE CONTROL DECLINE IN LEVELS OF CONCERN FOR BLOOD LEAD LEVELS

Manganese

Manganese is a naturally occurring element used in the steel industry, metallurgical processing, and as a component of dry cell batteries. Manganese is an essential element for humans and is a cofactor for a number of enzymatic reactions. A World Health Organization (WHO) committee concluded that an intake of 2 to 3 mg/day was inadequate for adults.

Following inhalation of manganese dust, absorption into the bloodstream occurs only if particles are sufficiently small to be able to penetrate deeply into the lungs. Long-term inhalation of manganese dust may result in a neurological disorder characterized by irritability, difficulty in walking, and speech disturbances. Short-term inhalation exposure has been associated with respiratory disease.

There are few reports of negative health effects in humans exposed to manganese in drinking water or food. Laboratory studies of animals exposed to manganese in water or food have demonstrated adverse health effects including changes in brain chemical levels, low birth weights in rats when mothers were exposed during pregnancy, slower than usual testes development, decreased body weight gain, and weakness and muscle rigidity in monkeys. (Oral RfDs (5E-03 mg/kg-day [water] and 1.4E-01 mg/kg-day [food]). The oral RfD for water is based on central nervous system effects in individuals chronically exposed to manganese in their drinking water. The oral RfD for food also is based on central nervous system effects and was derived from a WHO review of adult diets in several countries. The inhalation RfD for manganese, 1.43E-05 mg/kg-day, is based on a RfC of 5E-05 mg/m^3 mg/kg-day. The RfC is based on a study in which impairment of neurobehavioral function in occupationally exposed individuals was identified as the critical effect.

There are no human carcinogenicity data for manganese exposure. The data from some animal studies have shown increases in tumors in a small number of animals at high doses of manganese, but the data are inadequate to judge whether manganese can cause cancer. EPA has judged manganese not classifiable as to human carcinogenicity (Group D).

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Mercury

Mercury is a naturally occurring element that exists in three oxidation states--metallic mercury (Hg°), mercurous mercury (Hg_2++), and mercuric mercury (Hg++)-------and a variety of chemical forms. The most important mercury compounds with respect to human exposure are methyl mercury, mercuric mercury, and elemental mercury vapor.

Uptake of inorganic mercury and methyl mercury compounds occurs primarily through ingestion, with the major source of human exposure to methyl mercury occurring through the consumption of fish and shellfish. Mercury also can readily enter the body through inhalation of mercury vapor.

All forms of mercury, once absorbed, are distributed to tissues throughout the body via the bloodstream. The critical, or most sensitive, effect of inorganic mercury is kidney damage and CNS damage. Long-term exposure to all forms of mercury can permanently damage the brain, kidneys, and developing fetus. The form of mercury and route of exposure determine which health effects will be most severe. Mercury vapor and methyl mercury readily cross the blood-brain and placental barriers.

Prenatal life is very sensitive to methyl mercury poisoning, with subsequent effects in infants ranging from slowed mental and coordination development to a severe form of cerebral palsy. To date, these effects have been found to be irreversible. Depending upon the form, the level of mercury taken in, and the duration of exposure, effects on the adult nervous system can range from reversible feeling of burning, or pins and needles, and feeling "out-of-sorts", to irreversible brain damage leading to permanent tremors and shakiness, and constriction of the visual field.

Mercury has not been found to be carcinogenic in animals or humans. The oral RfD, 3E-04 mg/kg-day, is based on kidney effects observed in rats parenterally exposed to mercury. The inhalation RfD of 8.57E-05 mg/kg-day is derived from human inhalation studies in which neurotoxicity was identified as the critical effect.

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Polycyclic Aromatic Hydrocarbons (PAHs)

This toxicity profile focuses on the following high molecular weight, carcinogenic PAHs: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. PAHs consist of two or more fused benzene rings in linear, angular, or cluster arrangements. PAHs are formed during the incomplete burning of fossil fuel, garbage, or any organic matter. PAHs produced by burning may be carried into the air on dust particles and distributed into water and soil. In general, PAHs do not evaporate easily and do not dissolve in water.

Exposure to PAHs may occur by inhaling airborne particles, drinking water, or accidentally ingesting soil or dust containing PAHs. In addition, smoking tobacco or eating charcoal-broiled food are common routes of exposure to PAHs.

High molecular weight PAHs are known carcinogens, and potential health effects caused by PAHs are usually discussed in terms of an individual PAH compound's carcinogenic or non-carcinogenic effects. Little or no information concerning the noncarcinogenic effects of high molecular weight PAHs is available . Rapidly growing tissues, such as the intestinal lining, bone marrow, lymphoid organs, blood cells, and testes, seem to be especially susceptible targets to non-carcinogenic effects. Oral administration of benzo(a)pyrene to rats and mice results in developmental and reproductive effects. The lowest LOAEL reported for any effect of benzo(a)pyrene is 10 mg/kg-day, based on decreased fertility of offspring of female mice fed benzo(a)pyrene during gestation. Concentrations of 150 mg/kg or more administered to laboratory animals have been shown to inhibit body growth. However, EPA has not developed RfDs for high molecular weight PAHs.

Exposure to benzo(a)pyrene and other carcinogenic PAHs can cause cancer at the point of exposure. A toxicity equivalency approach is employed to evaluate the potential cancer risks posed by PAHs (EPA 1993). TEFs are defined as the ratio of the toxicity of a given PAH to that of benzo(a)pyrene. Note that the term *toxicity equivalency factor* is not currently used to describe the relative potency of PAHs; however, this terminology was used in this baseline human health risk assessment to be consistent with EPA, Region VI, guidance.

Animals exposed to high levels of benzo(a)pyrene in air develop lung tumors; when exposed via the dietary route they develop stomach tumors; when benzo(a)pyrene is painted on skin, animals develop skin tumors. Although RfDs and slope factors for dermal exposure to other chemicals are routinely extrapolated from oral-route values, it is inappropriate to use the oral slope factor of benzo(a)pyrene to evaluate carcinogenic risks from dermal exposure,

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because benzo(a)pyrene produces skin cancer through a direct action at the point of application.

The oral slope factor for benzo(a)pyrene, 7.3E+00 mg/kg-day^{-1}, is based on the geometric mean of four slope factors obtained through different modeling procedures. The four slope factors were derived from mouse and rat studies in which squamous cell papillomas and carcinomas were observed in the forestomach.

Selenium

Selenium is an essential trace element important in many biochemical and physiological processes including regulation of ion fluxes across membranes and stimulation of antibody synthesis. Selenium is found in all tissues of the body; highest concentrations occur in the kidney, liver, spleen, and pancreas. Recommended human dietary allowances (average daily intake) for selenium range from 10 to 15 μg for infants up to one year of age to 65 to 75 μg for pregnant or lactating women. There appears to be a relatively narrow range between levels of selenium intake that result in deficiency and those that cause toxicity.

Selenium occurs in several valence states, and its toxicity varies with the valence state and water solubility of the compound in which it occurs. The water solubility of the compound may affect gastrointestinal absorption rates as well. Gastrointestinal absorption in animals and humans for various selenium compounds ranges from about 44% to 95% of the ingested dose.

In humans, acute oral exposures can result in excessive salivation, garlic odor to the breath, shallow breathing, diarrhea, pulmonary edema, and death. Other reported symptoms of acute selenosis include tachycardia, nausea, vomiting, abdominal pain, abnormal liver function, muscle aches and pains, irritability, chills, and tremors.

General signs and symptoms of chronic selenosis in humans include loss of hair and nails, acropachia (clubbing of the fingers), skin lesions (redness, swelling, blistering, and ulcerations), tooth decay (mottling, erosion, and pitting), and nervous system abnormalities attributed to polyneuritis (peripheral anesthesia, acroparaethesia, pain in the extremities, hyperreflexia of the tendon, numbness, convulsions, paralysis, motor disturbances, and hemiplegia). Evidence of teratogenicity in humans and laboratory animals is lacking. However, adverse reproductive and developmental effects (decreased rates of conception, increased rates of fetal resorption, and reduced fetal body weights) have been reported for domesticated and laboratory animals overexposed to selenium.

In humans, inhalation of selenium or selenium compounds primarily affects the respiratory system. Dusts of elemental selenium and selenium dioxide can cause irritation of the skin and mucous membranes of the nose and throat, coughing, nosebleed, loss of sense of smell, dyspnea, bronchial spasms, bronchitis, and chemical pneumonia. Irritation and redness of the eyes, gastrointestinal distress (nausea and vomiting), depressed blood pressure, elevated pulse rate, headaches, dizziness, and malaise may also occur. Information on toxicity of selenium in humans following chronic inhalation exposures is not available.

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Epidemiologic studies in humans have failed to show a positive association between chronic oral exposures to selenium and an increased incidence of death. In studies on laboratory animals, selenites or selenates have not been found to be carcinogenic. An oral RfD (5E-3 mg/kg-day) for selenium is based on the incidence of clinical selenosis in residents of China. EPA has placed selenium and selenious acid in Group D, not classifiable as to carcinogenicity in humans.

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Vanadium

Vanadium is a naturally occurring grey metal. In the environment, vanadium is commonly found combined with other elements including oxygen and sulfur. Vanadium oxide is the compound of vanadium that is used most extensively by industry. The largest industrial use of vanadium oxide is in steel manufacturing, but it is also used in plastic, rubber, ceramic, and other chemical manufacturing.

Burning fuel oil and coal releases vanadium to the atmosphere. In water, vanadium is not very soluble, but is usually carried in surface water and groundwater in small particles. Because vanadium is naturally occurring, people are likely to be exposed to low concentrations of vanadium in food and drinking water. People are likely to be exposed to vanadium in air near industries that use vanadium, waste disposal areas of these industries, or downwind of fuel oil or coal burning areas. Once in the body, most vanadium is not absorbed from the respiratory or digestive tract. Vanadium is not believed to be absorbed through skin. Humans exposed to large amounts of vanadium in air have experienced coughs and eye and throat irritation. However, these effects stop soon after exposure stops. Long-term oral exposure of rats to vanadium causes minor cell changes in the kidneys and lungs. Female rats exposed to vanadium have offspring of decreased body weights. It is unknown whether humans experience effects similar to vanadium-exposed rats. An oral RfD (7E-3 mg/kg-day) has been derived based on lifetime rat exposure to vanadium in drinking water. There have been no specific studies of the carcinogenicity of vanadium. No increase of cancer has been noticed in studies of long-term oral exposure of rats, but these studies are less sensitive than specific cancer studies.

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ATTACHMENT S.E

CONSENT ACCESS QUESTIONNAIRE

CONSENT FOR ACCESS TO PROPERTY

Name: _____

Address of Property: _____

_____

I consent to officers, employees, and authorized representatives of the United States Environmental Protection Agency (EPA) entering and having continued access to my property, including the interior of my home, for the following purposes:

the taking of such soil, dust, water, and air samples as may be necessary;

other actions related to the investigation of interior, surface or subsurface areas;

the taking of a response action necessary to mitigate any threat to human health and the environment.

I realize that these actions by EPA are undertaken pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. Section 9601 et seq.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

_____ _____

Date Signature

I hearby agree to waive my privacy rights concerning personal information covered by the Privacy Act, 5 U.S.C. § 552a, gathered by officers, employees, and parties authorized by the United States Environmental Protection Agency (EPA) to the extent that I permit EPA to disclose Privacy Act-privileged information to appropriate health agencies for their use in health studies. I understand that this waiver only applies to the release of information relevant to the conduct of such health studies concerning the Agriculture Street Landfill area, and that the release of this information by EPA for other purposes is not covered by this waiver.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

_____ _____

Date Signature

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4. Does the property have a garden on it? _____ yes _____ no

   If yes does anyone eat fruits or vegetables from the garden? _____ yes _____ no
   If yes, what types of fruits and/or vegetables? _____

5. Does the property ever flood with water? _____ yes _____ no

   If yes, how often? ___ less than once a year
   ___ more than once a year

6. Are there problems with getting into the front or back yards of the property (such as gates or dogs) for the purpose of sample collection? _____

   _____

7. Do you own any pets? _____ (If so what kind?) _____

8. Has any additional sand or soil been placed on the property? _____ If so, do you know where the soil/sand came from? _____

9. Are there any groundwater wells on the property? _____
   If yes, is the water used for drinking? _____
   washing? _____
   watering lawn/gardening? _____

10. Are there any septic tanks or other underground tanks on the property? _____

11. Do you have new carpeting? _____ If yes, was it installed within the last year? _____

12. Have you recently painted the inside of your house? _____ If yes, what rooms and what brand of paint? _____

13. Do you want split samples?_____

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INFORMATION FORM

Property Address: _____

_____

1. The property: (please circle one of the following)

   a. is a vacant lot
   b. has a business on it
   c. has a vacant house on it
   d. has an occupied house on it
   e. has a church on it
   f. other _____

   (Note: If the property is regularly used as a day care, list the number of children usually present and age ranges)

   _____ Number of Children _____ Range of Age

2. Please complete the following:

   Property Owner: Name: _____

   Mailing Address: _____

   Home Phone: _____

   Work Phone: _____

   Property Renter: Name: _____

   Mailing Address: _____

   Home Phone: _____

   Work Phone: _____

3. If property has an occupied house on it answer the following:

   a. # of Occupants Age

   _____ 0-6

   _____ 7-12

   _____ 13-18

   _____ 18-55

   _____ 55 or older

   b. How long have you lived in the house? _____

APPENDIX T

COMMONLY USED TERMS IN ENVIRONMENTAL REPORTS

001160.0851

United States
Environmental Protection
Agency

Communications, Education,
And Public Affairs
(1704)

EPA 175-B-94-015
April 1994

EPA

Terms Of Environment

Glossary, Abbreviations, and Acronyms

(Revised April 1994)

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

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Introduction

Terms Of Environment defines in non-technical language the more commonly used environmental terms appearing in EPA publications, news releases, and other Agency documents available to the general public, students, the media, and Agency employees. The definitions do not constitute the Agency's official use of terms and phrases for regulatory purposes, and nothing in this document should be construed to alter or supplant any other federal document. Official terminology may be found in the laws and related regulations as published in such sources as the Congressional Record, Federal Register, and elsewhere.

The terms selected for inclusion are derived from previously published lists, internal glossaries produced by various programs and specific suggestions made by personnel in many Agency offices. The chemicals and pesticides selected for inclusion are limited to those most frequently referred to in Agency publications or that are the subject of major regulatory or program activities.

Definitions or information about substances or program activities not included herein may be found in EPA libraries or scientific/technical reference documents, or may be obtained from various program offices.

Those with suggestions for future editions should write to the Editorial Services Division, Office of Communications, Education, and Public Affairs, 1704, USEPA, Washington DC 20460.

Abbreviation and acronymn list begins on page 43

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A

A–Scale Sound Level: A measurement of sound approximating the sensitivity of the human ear, used to note the intensity or annoyance level of sounds.

Abandoned Well: A well whose use has been permanently discontinued or which is in a state of such disrepair that it cannot be used for its intended purpose.

Abatement: Reducing the degree or intensity of, or eliminating, pollution.

Absorbed Dose: The amount of a chemical that enters the body of an exposed organism.

Absorption: The uptake of water or dissolved chemicals by a cell or an organism (as tree roots absorb dissolved nutrients in soil.)

Accident Site: The location of an unexpected occurrence, failure or loss, either at a plant or along a transportation route, resulting in a release of hazardous materials.

Acclimatization: The physiological and behavioral adjustments of an organism to changes in its environment.

Acid Deposition: A complex chemical and atmospheric phenomenon that occurs when emissions of sulfur and nitrogen compounds and other substances are transformed by chemical processes in the atmosphere, often far from the original sources, and then deposited on earth in either wet or dry form. The wet forms, popularly called "acid rain," can fall as rain, snow, or fog. The dry forms are acidic gases or particulates.

Acid Mine Drainage: Drainage of water from areas that have been mined for coal or other mineral ores. The water has a low pH because of its contact with sulfur-bearing material and is harmful to aquatic organisms.

Acid Neutralizing Capacity: Measure of ability of water or soil to resist changes in pH.

Acid Rain: (See: acid deposition)

Acidic: The condition of water or soil that contains a sufficient amount of acid substances to lower the pH below 7.0.

Action Levels: 1. Regulatory levels recommended by EPA for enforcement by FDA and USDA when pesticide residues occur in food or feed commodities for reasons other than the direct application of the pesticide. As opposed to "tolerances" which are established for residues occurring as a direct re

sult of proper usage, action levels are set for inadvertent residues resulting from previous legal use or accidental contamination. 2. In the Superfund program, the existence of a contaminant concentration in the environment high enough to warrant action or trigger a response under SARA and the National Oil and Hazardous Substances Contingency Plan. The term is also used in other regulatory programs. (See: tolerances.)

Activated Carbon: A highly adsorbent form of carbon used to remove odors and toxic substances from liquid or gaseous emissions. In waste treatment it is used to remove dissolved organic matter from waste water. It is also used in motor vehicle evaporative control systems.

Activated Sludge: Product that results when primary effluent is mixed with bacteria-laden sludge and then agitated and aerated to promote biological treatment, speeding the breakdown of organic matter in raw sewage undergoing secondary waste treatment.

Activator: A chemical added to a pesticide to increase its activity.

Active Ingredient: In any pesticide product, the component that kills, or otherwise controls, target pests. Pesticides are regulated primarily on the basis of active ingredients.

Activity Plans: Written procedures in a school's asbestos-management plan that detail the steps a Local Education Agency (LEA) will follow in performing the initial and additional cleaning, operation and maintenance-program tasks; periodic surveillance; and reinspections required by the Asbestos Hazard Emergency Response Act (AHERA).

Acute Exposure: A single exposure to a toxic substance which results in severe biological harm or death. Acute exposures are usually characterized as lasting no longer than a day, as compared to longer, continuing exposure over a period of time.

Acute Toxicity: The ability of a substance to cause poisonous effects resulting in severe biological harm or death soon after a single exposure or dose. Also, any severe poisonous effect resulting from a single short-term exposure to a toxic substance. (See: chronic toxicity, toxicity.)

Adaptation: Changes in an organism's structure or habits that help it adjust to its surroundings.

Add-on Control Device: An air pollution control device such as carbon absorber or incinerator that reduces the pollution in an exhaust gas. The control device usually does not affect the process being controlled and thus is "add-on" technology, as opposed to a scheme to control pollution through altering the basic process itself.

Adequately Wet: Asbestos-containing material that is sufficiently mixed or penetrated with liquid to prevent the release of particulates.

Administrative Order On Consent: A legal agreement signed by EPA and an individual, business, or other entity through which the violator agrees to pay for correction of violations, take the required corrective or cleanup actions, or refrain from an activity. It describes the actions to be taken, may be subject to a comment period, applies to civil actions, and can be enforced in court.

Administrative Order: A legal document signed by EPA directing an individual, business, or other entity to take corrective action or refrain from an activity. It describes the violations and actions to be taken, and can be enforced in court. Such orders may be issued, for example, as a result of an administrative complaint whereby the respondent is ordered to pay a penalty for violations of a statute.

Administrative Procedures Act: A law that spells out procedures and requirements related to the promulgation of regulations.

Administrative Record: All documents which EPA considered or relied on in selecting the response action at a Superfund site, culminating in the record of decision for remedial action; an action memorandum for removal actions.

Adsorption: An advanced method of treating waste in which activated carbon removes organic matter from wastewater.

Adulterants: Chemical impurities or substances that by law do not belong in a food, or pesticide.

Adulterated: 1. Any pesticide whose strength or purity falls below the quality stated on its label. 2. A food,feed, or product that contains illegal pesticide residues.

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Advanced Treatment: A level of wastewater treatment more stringent than secondary treatment; requires an 85-percent reduction in conventional pollutant concentration or a significant reduction in nonconventional pollutants.

Advanced Wastewater Treatment: Any treatment of sewage that goes beyond the secondary or biological water treatment stage and includes the removal of nutrients such as phosphorus and nitrogen and a high percentage of suspended solids. (See: primary, secondary treatment.)

Advisory: A non-regulatory document that communicates risk information to those who may have to make risk management decisions.

Aerated Lagoon: A holding and/or treatment pond that speeds up the natural process of biological decomposition of organic waste by stimulating the growth and activity of bacteria that degrade organic waste.

Aeration: A process which promotes biological degradation of organic matter in water. The process may be passive (as when waste is exposed to air), or active (as when a mixing or bubbling device introduces the air).

Aeration Tank: A chamber used to inject air into water.

Aerobic Treatment: Process by which microbes decompose complex organic compounds in the presence of oxygen and use the liberated energy for reproduction and growth. (Such processes include extended aeration, trickling filtration, and rotating biological contactors.)

Aerobic: Life or processes that require, or are not destroyed by, the presence of oxygen. (See: anaerobic.)

Aerosol: A suspension of liquid or solid particles in a gas.

Affected Public: The people who live and/or work near a hazardous waste site or other source of pollutant emissions.

Afterburner: In incinerator technology, a burner located so that the combustion gases are made to pass through its flame in order to remove smoke and odors. It may be attached to or be separated from the incinerator proper.

Age Tank: A tank used to store a chemical solution of known concentration for feed to a chemical feeder. Also called a day tank.

Agent Orange: A toxic herbicide and defoliant used in the Vietnam conflict, containing 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 2-4 dichlorophenoxyacetic acid (2,4-D) with trace amounts of dioxin.

Agricultural Pollution: Farming wastes, including runoff and leaching of pesticides and fertilizers; erosion and dust from plowing; improper disposal of animal manure and carcasses; crop residues, and debris.

Agro-ecosystem: Land used for crops, pasture, and livestock; the adjacent uncultivated land that supports other vegetation and wildlife; and the associated atmosphere, the underlying soils, groundwater, and drainage networks.

AHERA Designated Person (ADP): A person designated by a Local Education Agency to ensure that the AHERA requirements for asbestos management and abatement are properly implemented.

Air Binding: Situation where air enters the filter media and harms both the filtration and backwash processes.

Air Changes Per Hour (ACH): The movement of a volume of air in a given period of time; if a house has one air change per hour, it means that all of the air in the house will be replaced in a one-hour period.

Air Contaminant: Any particulate matter, gas, or combination thereof, other than water vapor. (See: air pollutant.)

Air Curtain: A method of containing oil spills. Air bubbling through a perforated pipe causes an upward water flow that slows the spread of oil. It can also be used to stop fish from entering polluted water.

Air Gap: Open vertical gap or empty space that separates drinking water supply to be protected from another water system in a treatment plant or other location. The open gap protects the drinking water from contamination by backflow or backsiphonage.

Air Mass: A large volume of air with certain meteorological or polluted characteristics, e.g, a heat inversion or smogginess, while in one location. The characteristics can change as the air mass moves away.

Air Monitoring: (See: monitoring)

Air Padding: Pumping dry air into a container to assist with the withdrawal of liquid or to force a liquified gas such as chlorine out of the container.

Air Plenum: Any space used to convey air in a building, furnace, or structure. The space above a suspended ceiling is often used as an air plenum.

Air Pollutant: Any substance in air that could, in high enough concentration, harm man, other animals, vegetation, or material. Pollutants may include almost any natural or artificial composition of airborne matter capable of being airborne. They may be in the form of solid particles, liquid droplets, gases, or in combination thereof. Generally, they fall into two main groups: (1) those emitted directly from identifiable sources and (2) those produced in the air by interaction between two or more primary pollutants, or by reaction with normal atmospheric constituents, with or without photoactivation. Exclusive of pollen, fog, and dust, which are of natural origin, about 100 contaminants have been identified and fall into the following categories: solids, sulfur compounds, volatile organic chemicals, nitrogen compounds, oxygen compounds, halogen compounds, radioactive compounds, and odors.

Air Pollution Episode: A period of abnormally high concentration of air pollutants, often due to low winds and temperature inversion, that can cause illness and death. (See: episode, pollution.)

Air Pollution Control Device: Mechanism or equipment that cleans emissions generated by an incinerator by removing pollutants that would otherwise be released to the atmosphere.

Air Pollution: The presence of contaminant or pollutant substances in the air that do not disperse properly and interfere with human health or welfare, or produce other harmful environmental effects.

Air Quality Control Region: Federally designated area that is required to meet and maintain federal ambient air quality standards. May include nearby locations in the same state or nearby states that share common air pollution problems.

Air Quality Criteria: The levels of pollution and lengths of exposure above which adverse health and welfare effects may occur.

Air Quality Standards: The level of pollutants prescribed by regulations that may not be exceeded during a given time in a defined area.

Air Stripping: A treatment system that removes volatile organic compounds (VOCs) from contaminated ground

water or surface water by forcing an airstream through the water and causing the compounds to evaporate.

Air Toxics: Any air pollutant for which a national ambient air quality standard (NAAQS) does not exist (i.e., excluding ozone, carbon monoxide, PM-10, sulfur dioxide, nitrogen oxide) that may reasonably be anticipated to cause cancer, developmental effects, reproductive dysfunctions, neurological disorders, heritable gene mutations, or other serious or irreversible chronic or acute health effects in humans.

Airborne Particulates: Total suspended particulate matter found in the atmosphere as solid particles or liquid droplets. Chemical composition of particulates varies widely, depending on location and time of year. Airborne particulates include: windblown dust, emissions from industrial processes, smoke from the burning of wood and coal, and motor vehicle or non-road engine exhausts, exhaust of motor vehicles.

Airborne Release: Release of any chemical into the air.

Alachlor: A herbicide, marketed under the trade name Lasso, used mainly to control weeds in corn and soybean fields.

Alar: Trade name for daminozide, a pesticide that makes apples redder, firmer, and less likely to drop off trees before growers are ready to pick them. It is also used to a lesser extent on peanuts, tart cherries, concord grapes, and other fruits.

Aldicarb: An insecticide sold under the trade name Temik. It is made from ethyl isocyanate.

Algae: Simple rootless plants that grow in sunlit waters in proportion to the amount of available nutrients. They can affect water quality adversely by lowering the dissolved oxygen in the water. They are food for fish and small aquatic animals.

Algal Blooms: Sudden spurts of algal growth, which can affect water quality adversely and indicate potentially hazardous changes in local water chemistry.

Algicide: Substance or chemical used to specifically to kill or control algae.

Alkaline: The condition of water or soil which contains a sufficent amount of alkali substance to raise the pH above 7.0.

Alkalinity: The capacity of water to neutralize acids.

Alluvial: Relating to and/or sand deposited by flowing water.

Alternate Method: Any method of sampling and analyzing for an air pollutant that is not a reference or equivalent method but that has been demonstrated in specific cases-to EPA's satisfaction-to produce results adequate for compliance monitoring.

Alternative Fuels: Substitutes for traditional liquid, oil-derived motor vehicle fuels like gasoline and diesel. Includes methanol, ethanol, compressed natural gas, and others.

Alternative Remedial Contract Strategy Contractors: Government contractors who provide project management and technical services to support remedial response activities at National Priorities List sites.

Ambient Air: Any unconfined portion of the atmosphere: open air, surrounding air.

Ambient Air Quality Standards: (See: Criteria Pollutants and National Ambient Air Quality Standards.)

Ambient Temperature: Temperature of the surrounding air or other medium.

Amprometric Titration: A way of measuring concentrations of certain substances in water using an electric current that flows during a chemical reaction.

Anaerobic: A life or process that occurs in, or is not destroyed by, the absence of oxygen.

Anaerobic Decomposition: Reduction of the net energy level and change in chemical composition of organic matter caused by microorganisms in an oxygen-free environment.

Animal Studies: Investigations using animals as surrogates for humans with the expectation that the results are pertinent to humans.

Antagonism: Interference or inhibition of the effect of one chemical by the action of another.

Antarctic "Ozone Hole": Refers to the seasonal depletion of ozone in a large area over Antarctica.

Anti-Degradation Clause: Part of federal air quality and water quality requirements prohibiting deterioration where pollution levels are above the legal limit.

Applicable or Appropriate Requirements (ARARs): Any state or federal statute that pertains to protection of human life and the environment in addressing specific conditions or use of a particular cleanup technology at a Superfund site.

Aqueous: Something made up of, similar to, or containing water.

Aquifer: An underground geological formation, or group of formations, containing usable amounts of groundwater that can supply wells and springs.

Architectural Coatings: Coverings such as paint and roof tar that are used on enteriors of buildings.

Area of Review: In the UIC program, the area surrounding an injection well that is reviewed during the permitting process to determine if flow between aquifers will be induced by the injection operation.

Area Source: Any small source of nonnatural air pollution that is released over a relatively small area but which cannot be classified as a point source. Such sources may include vehicles and other small engines, small businesses and household activities.

Aromatic: A type of hydrocarbon, such as benzene or toluene, added to gasoline in order to increase octane. Some aromatics are toxic.

Arsenicals: Pesticides containing arsenic.

Artesian (Aquifer or Well): Water held under pressure in porous rock or soil confined by impermeable geological formations.

Asbestos: A mineral fiber that can pollute air or water and cause cancer or asbestosis when inhaled. EPA has banned or severely restricted its use in manufacturing and construction.

Asbestos Abatement: Procedures to control fiber release from asbestos-containing materials in a building or to remove them entirely, including removal, encapsulation, repair, enclosure, encasement, and operations and maintenance programs.

Asbestos-Containing Waste Materials (ACWM): Mill tailings or any waste that contains commercial asbestos and is generated by a source covered by the Clean Air Act Asbestos NESHAPS.

Asbestosis: A disease associated with inhalation of asbestos fibers. The disease makes breathing progressively more difficult and can be fatal.

Asbestos Program Manager: A building owner or designated representative who supervises all aspects of the facility asbestos management and control program.

Ash: The mineral content of a product remaining after complete combustion.

Assay: A test for a specific chemical or effect.

Assessment: In the asbestos-in-schools program, the evaluation of the physical condition and potential for damage of all friable asbestos containing materials and thermal insulation systems.

Assimilation: The ability of a body of water to purify itself of pollutants.

Assimilative Capacity: The capacity of a natural body of water to receive wastewaters or toxic materials without deleterious effects and without damage to aquatic life or humans who consume the water.

Association of Boards of Certification: An international organization representing boards which certify the operators of waterworks and wastewater facilities.

Attainment Area: An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

Attenuation: The process by which a compound is reduced in concentration over time, through absorption, adsorption, degradation, dilution, and/or transformation.

Attractant: A chemical or agent that lures insects or other pests by stimulating their sense of smell.

Attrition: Wearing or grinding down of a substance by friction. Dust from such processes contributes to air pollution.

Availability Session: Informal meeting at a public location where interested citizens can talk with EPA and state officials on a one-to-one basis.

Available Chlorine: A measure of the amount of chlorine available in chlorinated lime, hypochlorite compounds, and other materials used as a source of chlorine when compared with that of liquid or gaseous chlorines.

B

Back Pressure: A pressure that can cause water to backflow into the water supply when a user's waste water system is at a higher pressure than the public system.

Backflow/Back Siphonage: A reverse flow condition created by a difference in water pressures that causes water to flow back into the distribution pipes of a drinking water supply from any source other than the intended one.

Background Level: In air pollution control, the concentration of air pollutants in a definite area during a fixed period of time prior to the starting up or on the stoppage of a source of emission under control. In toxic substances monitoring, the average presence in the environment, originally referring to naturally occurring phenomena.

Backwashing: Reversing the flow of water back through the filter media to remove entrapped solids.

BACT-Best Available Control Technology: An emission limitation based on the maximum degree of emission reduction (considering energy, environmental, and economic impacts) achievable through application of production processes and available methods, systems, and techniques. BACT does not permit emissions in excess of those allowed under any applicable Clean Air Act provisions. Use of the BACT concept is allowable on a case by case basis for major new or modified emissions sources in attainment areas and applies to each regulated pollutant.

Bacteria: (Singular: bacterium) Microscopic living organisms that can aid in pollution control by metabolizing organic matter in sewage, oil spills or other pollutants. However, bacteria in soil, water or air can also cause human, animal and plant health problems.

Baffle: A flat board or plate, deflector, guide, or similar device constructed or placed in flowing water or slurry systems to cause more uniform flow velocities to absorb energy and to divert, guide, or agitate liquids.

Baffle Chamber: In incinerator design, a chamber designed to promote the settling of fly ash and coarse particulate matter by changing the direction and/or reducing the velocity of the gases produced by the combustion of the refuse or sludge.

Baghouse Filter: Large fabric bag, usually made of glass fibers, used to eliminate intermediate and large (greater than 20 microns in diameter) particles. This device operates like the bag of an electric vacuum cleaner, passing the air and smaller particles while entrapping the larger ones.

Bailer: A long pipe with a valve at the lower end, used to remove slurry from the bottom or side of a well as it is being drilled.

Baling: Compacting solid waste into blocks to reduce volume and simplify handling.

Ballistic Separator: A machine that sorts organic from inorganic matter for composting.

Band Application: The spreading of chemicals over, or next to, each row of plants in a field.

Banking: A system for recording qualified air emission reductions for later use in bubble, offset, or netting transactions. (See: emissions trading.)

Bar Screen: In wastewater treatment, a device used to remove large solids.

Barrier Coating(s): A layer of a material that obstructs or prevents passage of something through a surface that is to be protected, e.g. grout, caulk, or various sealing compounds; sometimes used with polyurethane membranes to prevent corrosion or oxidation of metal surfaces, chemical impacts on various materials, or, for example, to prevent radon infiltration through walls, cracks, or joints in a house.

Basal Application: In pesticides, the application of a chemical on plant stems or tree trunks just above the soil line.

Bed Load: Sediment particles resting on or near the channel bottom that are pushed or rolled along by the flow of water.

BEN: EPA's computer model for analyzing a violator's economic gain from not complying with the law.

Bench-scale Tests: Laboratory testing of potential cleanup technologies (See: treatability studies.)

Beryllium: An airborne metal hazardous to human health when inhaled. It is discharged by machine shops, ceramic and propellant plants, and foundries.

Best Available Control Measures (BACM): A term used to refer to the most effective measures (according to EPA guidance) for controlling small or dispersed particulates from sources such as roadway dust, soot and ash

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from woodstoves and open burning of rush, timber, grasslands, or trash.

Best Demonstrated Available Technology (BDAT): As identified by EPA, the most effective commercially available means of treating specific types of hazardous waste. The BDATs may change with advances in treatment technologies.

Best Management Practice (BMP): Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources.

Bimetal: Beverage containers with steel bodies and aluminum tops; handled differently from pure aluminum in recycling.

Bioaccumulants: Substances that increase in concentration in living organisms as they take in contaminated air, water, or food because the substances are very slowly metabolized or excreted. (See: biological magnification.)

Bioassay: Study of living organisms to measure the effect of a substance, factor, or condition by comparing before-and-after exposure or other data.

Biochemical Oxygen Demand (BOD): A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. The greater the BOD, the greater the degree of pollution.

Bioconcentration: The accumulation of a chemical in tissues of a fish or other organism to levels greater than in the surrounding medium.

Biodegradable: Capable of decomposing rapidly under natural conditions.

Biodiversity: Refers to the variety and variability among living organisms and the ecological complexes in which they occur. Diversity can be defined as the number of different items and their relative frequencies. For biological diversity, these items are organized at many levels, ranging from complete ecosystems to the biochemical structures that are the molecular basis of heredity. Thus, the term encompasses different ecosystem, species, and genes.

Biological Control: In pest control, the use of animals and organisms that eat or otherwise kill or out-compete pests.

Biological Magnification: Refers to the process whereby certain substances such as pesticides or heavy metals move up the food chain, work their way into rivers or lakes, and are eaten by aquatic organisms such as fish, which in turn are eaten by large birds, animals or humans. The substances become concentrated in tissues or internal organs as they move up the chain. (See: bioaccumulative.)

Biological Oxidation: Decomposition of complex organic materials by microorganisms. Occurs in self-purification of water bodies and in activated sludge wastewater treatment.

Biological Oxygen Demand (BOD): An indirect measure of the concentration of biologically degradable material present in organic wastes. It usually reflects the amount of oxygen consumed in five days by biological processes breaking down organic waste.

Biological Treatment: A treatment technology that uses bacteria to consume organic waste.

Biologicals: Vaccines, cultures and other preparations made from living organisms and their products, intended for use in diagnosing, immunizing, or treating humans or animals, or in related research.

Biomass: All of the living material in a given area; often refers to vegetation.

Biome: Entire community of living organisms in a single major ecological area. (See: biotic community.)

Biomonitoring: 1. The use of living organisms to test the suitability of effluents for discharge into receiving waters and to test the quality of such waters downstream from the discharge. 2. Analysis of blood, urine, tissues, etc., to measure chemical exposure in humans.

Bioremediation: Use of living organisms to clean up oil spills or remove other pollutants from soil, water, or wastewater; use of organisms such as non-harmful insects to remove agricultural pests or counteract diseases of trees, plants, and garden soil.

Biosphere: The portion of Earth and its atmosphere that can support life.

Biostabilizer: A machine that converts solid waste into compost by grinding and aeration.

Biota: The animal and plant life of a given region.

Biotechnology: Techniques that use living organisms or parts of organisms to produce a variety of products (from medicines to industrial enzymes) to improve plants or animals or to develop microorganisms to remove toxics from bodies of water, or act as pesticides.

Biotic Community: A naturally occurring assemblage of plants and animals that live in the same environment and are mutually sustaining and interdependent.(See: biome.)

Biotransformation: Conversion of a substance into other compounds by organisms; includes biodegredation.

Blackwater: Water that contains animal, human, or food waste.

Blood Products: Any product derived from human blood, including but not limited to blood plasma, platelets, red or white corpuscles, and derived licensed products such as interferon.

Bloom: A proliferation of algae and/or higher aquatic plants in a body of water; often related to pollution, especially when pollutants accelerate growth.

BOD5: The amount of dissolved oxygen consumed in five days by biological processes breaking down organic matter.

Bog: A type of wetland that accumulates appreciable peat deposits. Bogs depend primarily on precipitation for their water source, and are usually acidic and rich in plant residue with a conspicuous mat of living green moss.

Boom: 1. A floating device used to contain oil on a body of water. 2. A piece of equipment used to apply pesticides from a tractor or truck.

Botanical Pesticide: A pesticide whose active ingredient is a plant-produced chemical such as nicotine or strychnine. Also called a plant-derived pesticide.

Bottle Bill: Proposed or enacted legislation which requires a returnable deposit on beer or soda containers and provides for retail store or other redemption. Such legislation is designed to discourage use of throwaway containers.

Bottom Ash: The non-airborne combustion residue from burning pulverized coal in a boiler; the material which falls to the bottom of the boiler and is removed mechanically; a concentration of the non-combustible materials, which may include toxics.

Bottom Land Hardwoods: Forested freshwater wetlands adjacent to rivers in the southeastern United States,

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especially valuable for wildlife breeding, nesting and habitat.

Brackish: Mixed fresh and salt water.

Breakpoint Chlorination: Addition of chlorine to water until the chlorine demand has been satisfied.

Breakthrough: A crack or break in a filter bed that allows the passage of floc or particulate matter through a filter; will cause an increase in filter effluent turbidity.

Brine Mud: Waste material, often associated with well-drilling or mining, composed of mineral salts or other inorganic compounds.

Broadcast Application: The spreading of pesticides over an entire area.

Bubble: A system under which existing emissions sources can propose alternate means to comply with a set of emissions limitations; under the bubble concept, sources can control more than required at one emission point where control costs are relatively low in return for a comparable relaxation of controls at a second emission point where costs are higher.

Bubble Policy: (See: emissions trading.)

Buffer: A solution or liquid whose chemical makeup neutralizes acids or bases without a great change in pH.

Buffer Strips: Strips of grass or other erosion-resisting vegetation between or below cultivated strips or fields.

Building Cooling Load: The hourly amount of heat that must be removed from a building to maintain indoor comfort (measured in British Thermal Units BTUs).

Bulk Sample: A small portion (usually thumbnail size) of a suspect asbestos-containing building material collected by an asbestos inspector for laboratory analysis to determine asbestos content.

Bulky Waste: Large items of waste materials, such as appliances, furniture, large auto parts, trees, stumps.

Burial Ground (Graveyard): A disposal site for radioactive waste materials that uses earth or water as a shield.

By-product: Material, other than the principal product, generated as a consequence of an industrial process.

C

Cadmium (Cd): A heavy metal element that accumulates in the environment.

Cancellation: Refers to Section 6 (b) of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) which authorizes cancellation of a pesticide registration if unreasonable adverse effects to the environment and public health develop when a product is used according to widespread and commonly recognized practice, or if its labeling or other material required to be submitted does not comply with FIFRA provisions.

Cap: A layer of clay, or other impermeable material installed over the top of a closed landfill to prevent entry of rainwater and minimize leachate.

Capacity Assurance Plan: A statewide plan which supports a state's ability to manage the hazardous waste generated within its boundaries over a twenty year period.

Capillary Action: Movement of water through very small spaces to to molecular forces called capillary forces.

Capillary Fringe: The porous matrial just above the water table which may hold water by capillarity (a property of surface tension that draws water upwards) in the smaller void spaces.

Capture Efficiency: The fraction of organic vapors generated by a process that is directed to an abatement or recovery device.

Carbon Absorber: An add-on control device that uses activated carbon to absorb volatile organic compounds from a gas stream. (The VOCs are later recovered from the carbon.)

Carbon Adsorption: A treatment system that removes contaminants from ground water or surface water by forcing it through tanks containing activated carbon treated to attract the contaminants.

Carbon Monoxide (CO): A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion.

Carboxyhemoglobin: Hemoglobin in which the iron is bound to carbon monoxide (CO) instead of oxygen.

Carcinogen: Any substance that can cause or aggravate cancer.

Carrier: The inert liquid or solid material added to an active ingredient in a pesticide.

Carrying Capacity: 1. In recreation management, the amount of use a recreation area can sustain without loss of quality. 2. In wildlife management, the maximum number of animals an area can support during a given period.

CAS Registration Number: A number asigned by the Chemical Abstract Service to identify a chemical.

Cask: A thick-walled container (usually lead) used to transport radioactive material. Also called a coffin.

Catalyst: A substance that changes the speed or yield of a chemical reaction without being consumed or chemically changed by the chemical reaction.

Catalytic Converter: An air poilution abatement device that removes pollutants from motor vehicle exhaust, either by oxidizing them into carbon dioxide and water or reducing them to nitrogen and oxygen.

Catalytic Incinerator: A control device that oxidizes volatile organic compounds (VOCs) by using a catalyst to promote the combustion process. Catalytic incinerators require lower temperatures than conventional thermal incinerators, thus saving fuel and other costs.

Categorical Exclusion: A class of actions which either individually or cumulatively would not have a significant effect on the human environment and therefore would not require preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act (NEPA).

Categorical Pretreatment Standard: A technology-based effluent limitation for an industrial facility discharging into a municipal sewer system. Analogous in stringency to Best Availability Technology (BAT) for direct dischargers.

Cathodic Protection: A technique to prevent corrosion of a metal surface by making it the cathode of an electrochemical cell.

Cavitation: The formation and collapse of gas pockets or bubbles on the blade of an impeller or the gate of a valve; collapse of these pockets or bubbles drives water with such force that it can cause pitting of the gate or valve surface.

Cells: 1. In solid waste disposal, holes where waste is dumped, compacted, and covered with layers of dirt on a daily basis. 2. The smallest structural part of living matter capable of functioning as an independent unit.

Cementitious: Densely packed and nonfibrous friable materials.

Central Collection Point: Location were a generator of regulated medical waste consolidates wastes originally generated at various locations in his facility. The wastes are gathered together for treatment on-site or for transportation elsewhere for treatment and/or disposal. This term could also apply to community hazardous waste collections, industrial and other waste management systems.

Centrifugal Collector: A mechanical system using centrifugal force to remove aerosols from a gas stream or to de-water sludge.

Channelization: Straightening and deepening streams so water will move faster, a marsh-drainage tactic that can interfere with waste assimilation capacity, disturb fish and wildlife habitats, and aggravate flooding.

Characteristic: Any one of the four categories used in defining hazardous waste: ignitability, corrosivity, reactivity, and toxicity.

Chemical Oxygen Demand (COD): A measure of the oxygen required to oxidize all compounds, both organic and inorganic, in water.

Chemical Treatment: Any one of a variety of technologies that use chemicals or a variety of chemical processes to treat waste.

Chemnet: Mutual aid network of chemical shippers and contractors that assigns a contracted emergency response company to provide technical support if a representative of the firm whose chemicals are involved in an incident is not readily available.

Chemosterilant: A chemical that controls pests by preventing reproduction.

Chemtrec: The industry-sponsored Chemical Transportation Emergency Center; provides information and/or emergency assistance to emergency responders.

Chilling Effect: The lowering of the Earth's temperature because of increased particles in the air blocking the sun's rays. (See: greenhouse effect.)

Chisel Plowing: Preparing croplands by using a special implement that avoids complete inversion of the soil as with conventional plowing. Chisel plowing can leave a protective cover or crops residues on the soil surface to help prevent erosion and improve filtration.

Chlorinated Hydrocarbons: These include a class of persistent, broad-spectrum insecticides that linger in the environment and accumulate in the food chain. Among them are DDT, aldrin, dieldrin, heptachlor, chlordane, lindane, endrin, mirex, hexachloride, and toxaphene. Other examples include TCE, used as an industrial solvent.

Chlorinated Solvent: An organic solvent containing chlorine atoms, e.g., methylene chloride and 1,1,1-trichloromethane, used in aerosol spray containers and in highway paint.

Chlorination: The application of chlorine to drinking water, sewage, or industrial waste to disinfect or to oxidize undesirable compounds.

Chlorinator: A device that adds chlorine, in gas or liquid form, to water or sewage to kill infectious bacteria.

Chlorine-Contact Chamber: That part of a water treatment plant where effluent is disinfected by chlorine.

Chlorofluorocarbons (CFCs): A family of inert, nontoxic, and easily liquified chemicals used in refrigeration, air conditioning, packaging, insulation, or as solvents and aerosol propellants. Because CFCs are not destroyed in the lower atmosphere they drift into the upper atmosphere where their chlorine components destroy ozone.

Chlorophenoxy: A class of herbicides that may be found in domestic water supplies and cause adverse health effects.

Chlorosis: Discoloration of normally green plant parts caused by disease, lack of nutrients, or various air pollutants.

Cholinesterase: An enzyme found in animals that regulates nerve impulses. Cholinesterase inhibition is associated with a variety of acute symptoms such as nausea, vomiting, blurred vision, stomach cramps, and rapid heart rate.

Chromium: (See: heavy metals.)

Chronic Effect: An adverse effect on a human or animal in which symptoms recur frequently or develop slowly over a long period of time.

Chronic Toxicity: The capacity of a substance to cause long-term poisonous human health effects. (See: acute toxicity.)

Circle of Influence: The circular outer edge of a deppression produced in the water table by the pumping of water from a well. (See: cone of depression.)

Cistern: Small tank or storage facility used to store water for a home or farm; often used to store rain water.

Clarification: Clearing action that occurs during wastewater treatment when solids settle out. This is often aided by centrifugal action and chemically induced coagulation in wastewater.

Clarifier: A tank in which solids settle to the bottom and are subsequently removed as sludge.

Class I Area: Under the Clean Air Act, a Class I area is one in which visibility is protected more stringently than under the national ambient air quality standards; includes national parks, wilderness areas, monuments, and other areas of special national and cultural significance.

Clay Soil: Soil material containing more than 40 percent clay, less than 45 percent sand, and less than 40 percent silt.

Clean Coal Technology: Any technology not in widespread use prior to the Clean Air Act amendments of 1990. This Act will achieve significant reductions in pollutants associated with the burning of coal.

Clean Fuels: Blends or substitutes for gasoline fuels, including compressed natural gas, methanol, ethanol, liquified petroleum gas, and others.

Cleanup: Actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and/or the environment. The term "cleanup" is sometimes used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Clear Cut: Harvesting all the trees in one area at one time, a practice that can encourage fast rainfall or snowmelt runoff, erosion, sedimentation of streams and lakes, flooding, and destroys vital habitat.

Clear Well: A reservoir for storing filtered water of sufficient quantity to prevent the need to vary the filtration rate with varatioins in demand. Also used to provide chlorine contact time for disinfection.

Cloning: In biotechnology, obtaining a group of genetically identical cells from a single cell; making identical copies of a gene.

Closed-Loop Recycling: Reclaiming or reusing wastewater for non-potable purposes in an enclosed process.

Closure: The procedure a landfill operator must follow when a landfill reaches its legal capacity for solid waste: ceasing acceptance of solid waste and placing a cap on the landfill site.

Coagulation: Clumping of particles in wastewater to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

Coal Cleaning Technology: Precombustion process by which coal is physically or chemically treated to remove some of its sulfur so as to reduce sulfur dioxide emissions.

Coal Gasification: Conversion of coal to a gaseous product by one of several available technologies.

Coastal Zone: Lands and waters adjacent to the coast that exert an influence on the uses of the sea and its ecology, or whose uses and ecology are affected by the sea.

Coefficient of Haze (COH): A measurement of visibility interference in the atmosphere.

Co-fire: Burning of two fuels in the same combustion unit, e.g., coal and natural gas, or oil and coal.

Coke Oven: An industrial process which converts coal into coke, one of the basic materials used in blast furnaces for the conversion of iron ore into iron.

Cold Temperature CO: A standard for automobile carbon monoxide (CO) emissions to be met at a low temperature (i.e. 20 degrees Fahrenheit). Conventional automobile catalytic convertors are less efficient upon start-up at low temperatures.

Coliform Index: A rating of the purity of water based on a count of fecal bacteria.

Coliform Organism: Microorganism found in the intestinal tract of humans and animals. Their presence in water indicates fecal pollution and potentially adverse contamination by pathogens.

Collector Sewers: Pipes used to collect and carry wastewater from individual sources to an interceptor sewer that will carry it to a treatment facility.

Colloids: Very small, finely divided solids (that do not dissolve) that remain dispersed in a liquid for a long time due to their small size and electrical charge.

Combined Sewer Overflow: Discharge of a mixture of storm water and domestic waste when the flow capacity of a sewer system is exceeded during rainstorms.

Combined Sewers: A sewer system that carries both sewage and storm-water runoff. Normally, its entire flow goes to a waste treatment plant, but during a heavy storm, the volume of water may be so great as to cause overflows of untreated mixtures of storm water and sewage into receiving waters. Stormwater runoff may also carry toxic chemicals from industrial areas or streets into the sewer system.

Combustion: 1. Burning, or rapid oxidation, accompanied by release of energy in the form of heat and light. A basic cause of air pollution. 2. Refers to controlled burning of waste, in which heat chemically alters organic compounds, converting them into stable inorganics such as carbon dioxide and water.

Combustion Chamber: The actual compartment where waste is burned in an incinerator.

Combustion Product: Substance produced during the burning or oxidation of a material.

Command Post: Facility located at a safe distance upwind from an accident site, where the on-scene coordinator, responders, and technical representatives make response decisions, deploy manpower and equipment, maintain liaison with news media, and handle communications.

Comment Period: Time provided for the public to review and comment on a proposed EPA action or rulemaking after publication in the Federal Register.

Commercial Waste Management Facility: A treatment, storage, disposal, or transfer facility which accepts waste from a variety of sources, as compared to a private facility which normally manages a limited waste stream generated by its own operations.

Commercial Waste: All solid waste emanating from business establishments such as stores, markets, office buildings, restaurants, shopping centers, and theaters.

Commingled Recyclables: Mixed recyclables that are collected together.

Comminuter: A machine that shreds or pulverizes solids to make waste treatment easier.

Comminution: Mechanical shredding or pulverizing of waste. Used in both solid waste management and wastewater treatment.

Community: In ecology, a group of interacting populations in time and space. Sometimes, a particular subgrouping may be specified, such as the fish community in a lake or the soil arthropod community in a forest.

Community Relations: The EPA effort to establish two-way communication with the public to create understanding of EPA programs and related actions, to assure public input into decision-making processes related to affected communities, and to make certain that the Agency is aware of and responsive to public concerns. Specific community relations activities are required in relation to Superfund remedial actions.

Community Water System: A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Compaction: Reduction of the bulk of solid waste by rolling and tamping.

Complete Treatment: A method of treating water that consists of the addition of coagulant chemicals, flash mixing, coagulation-flocculation, sedimentation, and filtration. Also called conventional filtration.

Compliance Coal: Any coal tht emits less than 1.2 pounds of sulfur dioxide per million Btu when burned. Also known as low sulfur coal.

Compliance Coating: A coating whose volatile organic compound content does not exceed that allowed by regulation.

Compliance Cycle: The 9-year calendar year cycle, beginning January 1, 1993, during which public water systems must monitor. Each cycle consists of three 3-year compliance periods.

Compliance Monitoring: Collection and evaluation of data, including self-monitoring reports, and verification to show whether pollutant concentrations and loads contained in permitted discharges are in compliance with the limits and conditions specified in the permit.

Compliance Schedule: A negotiated agreement between a pollution source and a government agency that specifies dates and procedures by which a source will reduce emissions and, thereby, comply with a regulation.

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Composite Sample: A series of water samples taken over a given period of time and weighted by flow rate.

Compost: The relatively stable humus material that is produced from a composting process in which bacteria in soil mixed with garbage and degradable trash break down the mixture into organic fertilizer.

Composting: The controlled biological decomposition of organic material in the presence of air to form a humus-like material. Controlled methods of composting include mechanical mixing and aerating, ventilating the materials by dropping them through a vertical series of aerated chambers, or placing the compost in piles out in the open air and mixing it or turning it periodically.

Compressed Natural Gas (CNG): An alternative fuel for motor vehicles; considered one of the cleanest because of low hydrocarbon emissions and its vapors are relatively non-ozone producing. It does, however, emit a significant quantity of nitrogen oxides.

Conditional Registration: Under special circumstances, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) permits registration of pesticide products that is "conditional" upon the submission of additional data. These special circumstances include a finding by the EPA Administrator that a new product or use of an existing pesticide will not significantly increase the risk of unreasonable adverse effects. A product containing a new (previously unregistered) active ingredient may be conditionally registered only if the Administrator finds that such conditional registration is in the public interest, that a reasonable time for conducting the additional studies has not elapsed, and the use of the pesticide for the period of conditional registration will not present an unreasonable risk.

Conditionally Exempt Generators (CE): Persons or enterprises which produce less than 220 pounds of hazardous waste per month. Exempt from most regulation, they are required merely to determine whether their waste is hazardous, notify appropriate state or local agencies, and ship it by permitted facility for proper disposal. (See: small quantity generator.)

Conductance: A rapid method of estimating the dissolved solids content of water supply by determining the capacity of a water sample to carry an electrical current.

Conductivity: A measure of the ability of a solution to carry and electrical curerent.

Cone of Depression: A depression in the water table that develops around a pumped well.

Cone of Influence: The depression, roughly conical in shape, produced in a water table by the pumping of a well.

Confined Aquifer: An aquifer in which ground water is confined under pressure which is significantly greater than atmospheric pressure.

Confluent Growth: A continuous bacterial growth covering all or part of the filtration area of a membrane filter in which the bacteria colonies are not discrete.

Consent Decree: A legal document, approved by a judge, that formalizes an agreement reached between EPA and potentially responsible parties (PRPs) through which PRPs will conduct all or part of a cleanup action at a Superfund site; cease or correct actions or processes that are polluting the environment; or otherwise comply with EPA initiated regulatory enforcement actions to resolve the contamination at the Superfund site involved. The consent decree describes the actions PRPs will take and may be subject to a public comment period.

Conservation: Preserving and renewing, when possible, human and natural resources. The use, protection, and improvement of natural resources according to principles that will assure their highest economic or social benefits.

Construction and Demolition Waste: Waste building materials, dredging materials, tree stumps, and rubble resulting from construction, remodeling, repair, and demolition of homes, commercial buildings and other structures and pavements. May contain lead, asbestos, or other hazardous substances.

Construction Ban: If, under the Clean Air Act, EPA disapproves an area's planning requirements for correcting nonattainment, EPA can ban the construction or modification of any major stationery source of the pollutant for which the area is in nonattainment.

Consumptive Water Use: Water removed from available supplies without return to a water resources system, e.g., water used in manufacturing, agriculture, and food preparation.

Contact Pesticide: A chemical that kills pests when it touches them, instead of by ingestion. Also, soil that contains the minute skeletons of certain algae that scratch and dehydrate waxy coated insects.

Contaminant: Any physical, chemical, biological, or radiological substance or matter that has an adverse affect on air, water, or soil.

Contamination: Introduction into water, air, and soil of microorganisms, chemicals, toxic substances, wastes, or waste water in a concentration that makes the medium unfit for its next intended use. Also applies to surfaces of objects, buildings, and various household and agricultural use products.

Contingency Plan: A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or other accident that releases toxic chemicals, hazardous waste, or radioactive materials that threaten human health or the environment. (See: National Oil and Hazardous Substances Contingency Plan.)

Continuous Discharge: A routine release to the environment that occurs without interruption, except for infrequent shutdowns for maintenance, process changes, etc.

Continuous Sample: A flow of water from a particular place in a plant to the location where samples are collected for testing. May be used to obtain grab or composite samples.

Contour Plowing: Soil tilling method that follows the shape of the land to discourage erosion.

Contour Strip Farming: A kind of contour farming in which row crops are planted in strips, between alternating stripls of close-growing, erosion-resistant forage crops.

Contract Labs: Laboratories under contract to EPA, which analyze samples taken from waste, soil, air, and water or carry out research projects.

Control Technique Guidelines (CTG): A series of EPA documents designed to assist states in defining reasonable available control technology (RACT) for major sources of volatile organic compounds (VOC).

Controlled Reaction: A chemical reaction under temperature and pressure conditions maintained within safe

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limits to produce a desired product or process.

Conventional Filtration: (See: complete treatment.)

Conventional Pollutants: Statutorily listed pollutants understood well by scientists. These may be in the form of organic waste, sediment, acid, bacteria, viruses, nutrients, oil and grease, or heat.

Conventional Systems: Systems that have been traditionally used to collect municipal wastewater in gravity sewers and convey it to a central primary or secondary treatment plant prior to discharge to surface waters.

Conventional Tilling: Tillage operations considered standard for a specific location and crop and that tend to bury the crop residues; usually considered as a base for determining the cost effectiveness of control practices.

Conveyance Loss: Water loss in pipes, channels, conduits, ditches by leakage or evaporation.

Cooling Electricity Use: Amount of electricity used to meet the building cooling load. (See: building cooling load.)

Cooling Tower: A structure that helps remove heat from water used as a coolant; e.g., in electric power generating plants.

Cooperative Agreement: An assistance agreement whereby EPA transfers money, property, services or anything of value to a state for the accomplishment of CERCLA-authorized activities or tasks.

Core: The uranium-containing heart of a nuclear reactor, where energy is released.

Core Program Cooperative Agreement: An assistance agreement whereby EPA supports states or tribal governments with funds to help defray the cost of non-item-specific administrative and training activities.

Corrosion: The dissolution and wearing away of metal caused by a chemical reaction such as between water and the pipes, chemicals touching a metal surface, or contact between two metals.

Corrosive: A chemical agent that reacts with the surface of a material causing it to deteriorate or wear away.

Cost/Benefit Analysis: A quantitative evaluation of the costs which would be incurred by implementing an environmental regulation versus the overall benefits to society of the proposed action.

Cost-Effective Alternative: An alternative control or corrective method identified after analysis as being the best available in terms of reliability, performance, and cost. Although costs are one important consideration, regulatory and compliance analysis does not require EPA to choose the least expensive alternative. For example, when selecting or approving a method for cleaning up a Superfund site the Agency balances costs with the long-term effectiveness of the methods proposed and the potenetial danger posed by the site.

Cost Recovery: A legal process by which potentially responsible parties who contributed to contamination at a Superfund site can be required to reimburse the Trust Fund for money spent during any cleanup actions by the federal government.

Cost Sharing: A publicly financed program through which society, as a beneficiary of environmental protection, shares part of the cost of pollution control with those who must actually install the controls. In Superfund, for example, the government may pay part of the cost of a cleanup action with those responsible for the pollution paying the major share.

Cover Crop: A crop that provides temporary protection for delicate seedlings and/or provides a cover canopy for seasonal soil protection and improvement between normal crop production periods.

Cover Material: Soil used to cover compacted solid waste in a sanitary landfill.

Cradle-to-Grave or Manifest System: A procedure in which hazardous materials are identified and followed as they are produced, treated, transported, and disposed of by a series of permanent, linkable, descriptive documents (e.g., manifests). Commonly referred to as the cradle-to-grave system.

Criteria Pollutants: The 1970 amendments to the Clean Air Act required EPA to set National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. EPA has identified and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, total suspended particulates, sulfur dioxide, lead, and nitrogen oxide. The term, "criteria pollutants" derives from the requirement that EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

Criteria: Descriptive factors taken into account by EPA in setting standards for various pollutants. These factors are used to determine limits on allowable concentration levels, and to limit the number of violations per year. When issued by EPA, the criteria provide guidance to the states on how to establish their standards.

Crop Consumptive Use: The amount of water transpired during plant growth plus what evaporated from the soil surface and foliage in the crop area.

Crop Rotation: Planting a succession of different crops on the same land rea as opposed to planting the same crop time after time.

Cross-Connection: Any actual or potential connection between a drinking water systemm and an unapproved water supply or other source of contamination.

Cubic Feet Per Minute (CFM): A measure of the volume of a substance flowing through air within a fixed period of time. With regard to indoor air, refers to the amount of air, in cubic feet, that is exchanged with indoor air in a minute's time, i.e., the air exchange rate. Also applies to liquid flows.

Cullet: Crushed glass.

Cultural Eutrophication: Increasing rate at which water bodies "die" by pollution from human activities.

Cultures and Stocks: Infectious agents and associated biologicals including: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; waste from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures. (See: regulated medical waste.)

Cumulative Exposure: The sum of exposures of an organism to a pollutant over a period of time.

Cumulative Working Level Months (CWLM): The sum of lifetime exposure to radon working levels expressed in total working level months.

Curb Stop: A water service shutoff valve located in a water service pipe near the curb and between the water main and the building.

Curbside Collection: Method of collecting recyclable materials at homes, community districts or businesses.

Cutie-Pie: An instrument used to measure radiation levels.

Cyclone Collector: A device that uses centrifugal force to pull large particles from polluted air.

D

Data Call-In: A part of the Office of Pesticide Programs (OPP) process of developing key required test data, especially on the long-term, chronic effects of existing pesticides, in advance of scheduled Registration Standard reviews. Data Call-In from manufacturers is an adjunct of the Registration Standards program intended to expedite re-registration.

Day Tank: (See: age tank)

DDT: The first chlorinated hydrocarboninsecticide chemical name: Dichloro-Diphenyl-Trichloroethane). It has a half-life of 15 years and can collect in fatty tissues of certain animals. EPA banned registration and interstate sale of DDT for virtually all but emergency uses in the United States in 1972 because of its persistence in the environment and accumulation in the food chain.

Dead End: The end of a water main which is not connected to other parts of the distribution system.

Decant: To draw off the upper layer of liquid after the heaviet material (a solid or another liquid) has settled.

Decay Products: Degraded radioactive materials, often referred to as "daughters" or "progeny"; radon decay products of most concern from a public health standpoint are polonium-214 and polonium-218.

Dechlorination: Removal of chlorine from a substance by chemically replacing it with hydrogen or hydroxide ions in order to detoxify a substances.

Decomposition: The breakdown of matter by bacteria and fungi, changing the chemical makeup and physical appearance of materials.

Decontamination: Removal of harmful substances such as noxious chemicals, harmful bacteria or other organisms, or radioactive material from exposed individuals, rooms and furnishings in buildings, or the exterior environment.

Deep-Well Injection: Deposition of raw or treated, filtered hazardous waste by pumping it into deep wells, where it is contained in the pores of permeable subsurface rock.

Deflocculating Agent: A material added to a suspension to prevent settling.

Defluoridation: The removal of excess flouride in drinking water to prevent the staining of teeth.

Defoliant: An herbicide that removes leaves from trees and growing plants.

Degasification: A water treatment that removes dissolved gases from the water.

Delegated State: A state (or other governmental entity such as a tribal government) that has received authority to administer an environmental regulatory program in lieu of a federal counterpart. As used in connection with NPDES, UIC, and PWS programs, the term does not connote any transfer of federal authority to a state.

Delist: Use of the petition process to have a facility's toxic designation rescinded.

Demand-side Waste Management: Prices whereby consumers use purchasing decisions to communicate to product manufacturers that they prefer environmentally sound products packaged with the least amount of waste, made from recycled or recyclable materials, and containing no hazardous substances.

Demineralization: A treatment process that removes dissolved minerals from water.

Denitrification: The anaerobic biological reduction of nitrate to nitrogen gas.

Density: A measure of how heavy a solid, liquid, or gas is for its size.

Depletion Curve: In hydraulics, a graphical representation of water depletion from storage-stream channels, surface soil, and groundwater. A depletion curve can be drawn for base flow, direct runoff, or total flow.

Depressurization: A condition that occurs when the air pressure inside a structure is lower that the air pressure outside. Depressurization can occur when household appliances such as fireplaces or furnaces, that consume or exhaust house air, are not supplied with enough makeup air. Radon may be drawn into a house more rapidly under depressurized conditions.

Dermal Exposure: Contact between a chemical and the skin.

Dermal Toxicity: The ability of a pesticide or toxic chemical to poison people or animals by contact with the skin. (See: contact pesticide.)

DES: A synthetic estrogen, diethylstilbestrol is used as a growth stimulant in food animals. Residues in meat are thought to be carcinogenic.

Desalination: [Desalinization] (1) Removing salts from ocean or brackish water by using various technologies. (2) Removal of salts from soil by artificial means, usually leaching.

Desiccant: A chemical agent that absorbs moisture; some desiccants are capable of drying out plants or insects, causing death.

Design Capacity: The average daily flow that a treatment plant or other facility is designed to accommodate.

Design Value: The monitored reading used by EPA to determine an area's air quality status, e.g., for ozone, the fourth highest reading measured over the most recent three years is the design value.

Designated Pollutant: An air pollutant which is neither a criteria nor hazardous pollutant, as described in the Clean Air Act, but for which new source performance standards exist. The Clean Air Act does require states to control these pollutants, which include acid mist, total reduced sulfur (TRS), and fluorides.

Designated Uses: Those water uses identified in state water quality standards that must be achieved and maintained as required under the Clean Water Act. Uses can include cold water fisheries, public water supply, irrigation, etc.

Designer Bugs: Popular term for microbes developed through biotechnology that can degrade specific toxic chemicals at their source in toxic waste dumps or in ground water.

Destination Facility: The facility to which regulated medical waste is shipped for treatment and destruction, incineration, and/or disposal.

Destratification: Vertical mixing within a lake or reservoir to totally or partially eliminate separate layers of temperature, plant, or animal life.

Destroyed Medical Waste: Regulated medical waste that has been ruined, torn apart, or mutilated through ther-

mal treatment, melting, shredding, grinding, tearing, or breaking, so that it is no longer generally recognized as medical waste, but has not yet been treated (excludes compacted regulated medical waste.)

Destruction and Removal Efficiency (DRE): A percentage that represents the number of molecules of a compound removed or destroyed in an incinerator relative to the number of molecules that entered the system (e.g., a DRE of 99.99 percent means that 9,999 molecules are destroyed for every 10,000 that enter; 99.99 percent is known as "four nines." For some pollutants, the RCRA removal requirement may be a stringent as "six nines.")

Destruction Facility: A facility that destroys regulated medical waste by mashing or mutilating it.

Detention Time: 1. The theoretical calculated time required for a small amount of water to pass through a tank at a given rate of flow. 2. The actual time that a small amount of water is in a settling basin, flocculating basin, or rapid-mix chamber. 3. In storage reservoirs, the length of time water will be held before being used.

Desulfurization: Removal of sulfur from fossil fuels to reduce pollution.

Detectable Leak Rate: The smallest leak (from a storage tank), expressed in terms of gallons-or liters-per-hour, that a test can reliably discern with a certain probability of detection or false alarm.

Detection Criterion: A predetermined rule to ascertain whether a tank is leaking or not. Most volumetric tests use a threshold value as the detection criterion. (See: volumetric tank tests.)

Detergent: Synthetic washing agent that helps to remove dirt and oil. Some contain compounds which kill useful bacteria and encourage algae growth when they are in wastewater that reaches receiving waters.

Development Effects: Adverse effects such as altered growth, structural abnormality, functional deficiency, or death observed in a developing organism.

Dewater: 1. Remove or separate a portion of the water in a sludge or slurry to dry the sludge so it can be handled and disposed. 2. Remove or drain the water from a tank or trench.

Diatomaceous Earth (Diatomite): A chalk-like material (fossilized diatoms) used to filter out solid waste in wastewater treatment plants; also used as an active ingredient in some powdered pesticides.

Diazinon: An insecticide. In 1986, EPA banned its use on open areas such as sod farms and golf courses because it posed a danger to migratory birds. The ban did not apply to agricultural, home lawn, or commercial establishment uses.

Dibenzofurans: A group of highly toxic organic compounds.

Dicofol: A pesticide used on citrus fruits.

Diffused Air: A type of aeration that forces oxygen into sewage by pumping air through perforated pipes inside a holding tank.

Diffusion: The movement of suspended or dissolved particles from a more concentrated to a less concentrated area. The process tends to distribute the particles more uniformly.

Digester: In wastewater treatment, a closed tank; in solid-waste conversion, a unit in which bacterial action is induced and accelerated in order to break down organic matter and establish the proper carbon to nitrogen ratio.

Digestion: The biochemical decomposition of organic matter, resulting in partial gasification, liquefaction, and mineralization of pollutants.

Dike: A low wall that can act as a barrier to prevent a spill from spreading.

Diluent: Any liquid or solid material used to dilute or carry an active ingredient.

Dilution Ratio: The relationship between the volume of water in a stream and the volume of incoming water. It affects the ability of the stream to assimilate waste.

Dimitic: Lakes and reservoirs that freeze over and normally go through two stratifications and two mixing cycles a year.

Dinocap: A fungicide used primarily by apple growers to control summer diseases. EPA proposed restrictions on its use in 1986 when laboratory tests found it caused birth defects in rabbits.

Dinoseb: A herbicide that is also used as a fungicide and insecticide. It was banned by EPA in 1986 because it posed the risk of birth defects and sterility.

Dioxin: Any of a family of compounds known chemically as dibenzo-p-dioxins. Concern about them arises from their potential toxicity and contaminants in commercial products. Tests on laboratory animals indicate that it is one of the more toxic man-made compounds.

Direct Discharger: A municipal or industrial facility which introduces pollution through a defined conveyance or system such as outlet pipes; a point source.

Direct Filtration: A method of treating water which consists of the addition of coagulent chemicals, flash mixing, coagulation, minimal flocculation, and filtration. Sedimentation is not used.

Direct Runoff: Water that flows over the ground surface or through the ground directly into streams, rivers, and lakes.

Discharge: Flow of surface water in a stream or canal or the outflow of ground water from a flowing artisian well, ditch, or spring. Can also apply to discharge of liquid effluent from a facility or to chemical emissions into the air through designated venting mechanisms.

Disinfectant: A chemical or physical process that kills pathogenic organisms in water. Chlorine is often used to disinfect sewage treatment effluent, water supplies, wells, and swimming pools.

Disinfectant By-Product: A compound formed by the reaction of a disinfenctant such as chlorine with organic material in the water supply.

Disinfectant Time: The time it takes water to move from the point of disinfectant application (or the previous point of residual disinfectant measurement) to a point before or at the point where the residual disinfectant is measured.

Dispersant: A chemical agent used to break up concentrations of organic material such as spilled oil.

Disposables: Consumer products, other items, and packaging used once or a few times and discarded.

Disposal: Final placement or destruction of toxic, radioactive, or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials from removal actions or accidental releases. Disposal may be accomplished through use of approved secure

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landfills, surface impoundments, land farming, deep-well injection, ocean dumping, or incineration.

Dissolved Oxygen (DO): The oxygen freely available in water, vital to fish and other aquatic life and for the prevention of odors. DO levels are considered a most important indicator of a water body's ability to support desirable aquatic life. Secondary and advanced waste treatment are generally designed to ensure adequate DO in waste-receiving waters.

Dissolved Solids: Disintegrated organic and inorganic material in water. Excessive amounts make water unfit to drink or use in industrial processes.

Distillation: The act of purifying liquids through boiling, so that the steam condenses to a pure liquid and the pollutants remain in a concentrated residue.

Diversion: 1. Use of part of a stream flow as water supply. 2. A channel with a supporting ridge on the lower side constructed across a slope to divert waster at a non-erosive velocity to sites where ait can be used and disposed of.

Diversion Rate: The percentage of waste materials diverted from traditional disposal such as landfilling or incineration to be recycled, composted, or re-used.

DNA Hybridization: Use of a segment of DNA, called a DNA probe, to identify its complementary DNA; used to detect specific genes.

Dosage/Dose: The actual quantity of a chemical administered to an organism or to which it is exposed.

Dose Equivalent: The product of the absorbed dose from ionizing radiation and such factors as account for biological differences due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements.

Dose Response: How a biological organism's response to a toxic substance quantitatively shifts as its overall exposure to the substance changes (e.g., a small dose of carbon monoxide may cause drowsiness; a large dose can be fatal.)

Dose-Response Assessment: Estimating the potency of a chemical.

Dose-Response Relationship: The quantitative relationship between the amount of exposure to a substance and the extent of toxic injury or disease produced.

DOT Reportable Quantity: The quantity of a substance specified in U.S. Department of Transportation regulation that triggers labelling, packaging and other requirements related to shipping such substances.

Downgradient: The diretion that groundwater flows; similar to "downstream" for surface water.

Draft: 1. The act of drawing or removing water from a tank or reservoir. 2. The water which is drawn or removed.

Draft Permit: A preliminary permit drafted and published by EPA; subject to public review and comment before final action on the application.

Drainage: Improving the productivity of agricultural land by removing excess water from the soil by such means as ditches or subsurface drainage tiles.

Drainage Basin: The area of land that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel.

Drainage Well: A well drilled to carry excess water off agricultural fieleds. Because they act as a funnel from the surface to the groundwater below, drainage wells can contribute to groundwater pollution.

Drawdown: 1. The drop in the water table or level of water in the ground when water is being pumped from a well. 2. The amount of water used from a tank or reservoir. 3. The drop in the water level of a tank or reservoir.

Dredging: Removal of mud from the bottom of water bodies. This can disturb the ecosystem and cause silting that kills aquatic life. Dredging of contaminated muds can expose biota to heavy metals and other toxics. Dredging activities may be subject to regulation under Section 404 of the Clean Water Act.

Drinking Water Equivalent Level: Protective level of exposure related to potentially non-carcinogenc effects of chemicals that are also known to cause cancer.

Drop-off: Recyclable materials collection method in which individuals bring them to a designated collection site.

Dump: A site used to dispose of solid waste without environmental controls.

Dustfall Jar: An open container used to collect large particles from the air for measurement and analysis.

Dystrophic Lakes: Acidic, shallow bodies of water that contain much humus and/or other organic matter; contain many plants but few fish.

E

Ecological Impact: The effect that a man-made or natural activity has on living organisms and their non-living (abiotic) environment.

Ecology: The relationship of living things to one another and their environment, or the study of such relationships.

Ecological Indicator: A characteristic of the environment that, when measured, quantifies magnitude of stress, habitat characteristics, degree of exposure to a stressor, or ecological response to exposure. The term is a collective term for response, exposure, habitat, and stressor indicators.

Ecological Risk Assessment: The application of a formal framework, analytical process, or model to estimate the effects of human actions(s) on a natural resource and to interpret the significance of those effects in light of the uncertainties identified in each component of the assessment process. Such analysis includes initial hazard identification, exposure and dose-response assessments, and risk characterization.

Economic Poisons: Chemicals used to control pests and to defoliate cash crops such as cotton.

Ecosphere: The "bio-bubble" that contains life on earth, in surface waters, and in the air. (See: biosphere.)

Ecosystem: The interacting system of a biological community and its non-living environmental surroundings.

Ecosystem Structure: Attributes related to instantaneous physical state of an ecosystem; examples include species population density, species richness or evenness, and standing crop biomass.

Ecotone: A habitat created by the juxtaposition of distinctly different habitats; an edge habitat; or an ecological zone or boundary where two or more ecosystems meet.

Effluent: Wastewater, treated or untreated that flows out of a treatment plant, sewer, or industrial outfall.

Generally refers to wastes discharged into surface waters.

Effluent Guidelines: Technical EPA documents which set effluent limitations for given industries and pollutants.

Effluent Limitation: *Restrictions* established by a state or EPA on quantities, rates, and concentrations in wastewater discharges.

Effluent Standard: (See: effluent limitation.)

Ejector: A device used to disperse a chemical solution into water being treated.

Electrodialysis: A process that uses electrical current applied to permeable membranes to remove minerals from water. Often used to desalinate salty or brackish water.

Electrostatic Precipitator (ESP): A device that removes particles from a gas stream (smoke) after combustion occurs. The ESP imparts an electrical charge to the particles, causing them to adhere to metal plates inside the precipitator. Rapping on the plates causes the particles to fall into a hopper for disposal.

Eligible Costs: The construction costs for waste-water treatment works upon which EPA grants are based.

EMAP Data: Environmental monitoring data collected under the auspices of the Environmental Monitoring and Assessment Program. All EMAP data share the common attribute of being of known quality, having been collected in the context of explicit data quality objectives (DQOs) and a consistent quality assurance program.

Emergency (Chemical): A situation created by an accidental release or spill of hazardous chemicals that poses a threat to the safety of workers, residents, the environment, or property.

Emergency Episode: (See: air pollution episode.)

Emergency Response Values: Concentrations of chemicals, published by various groups, defining acceptable levels for short-term exposures in emergencies.

Emission: Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities; from residential chimneys; and from motor vehicle, locomotive, or aircraft exhausts.

Emission Cap: A limit designed to prevent projected growth in emissions from existing and future stationary sources from eroding any mandated reductions. Generally, such provisions require any emission growth from facilities under the restrictions be offset by equivalent reductions at other facilities under the same cap. (See: *emissions trading*)

Emission Factor: The relationship between the amount of pollution produced and the amount of raw material processed. For example, an emission factor for a blast furnace making iron would be the number of pounds of particulates per ton of raw materials.

Emission Inventory: A listing, by source, of the amount of air pollutants discharged into the atmosphere of a community; used to establish emission standards.

Emission Standard: The maximum amount of air polluting discharge legally allowed from a single source, mobile or stationary.

Emissions Trading: The creation of surplus emission reductions at certain stacks, vents or similar emissions sources and the use of this surplus to meet or redefine pollution requirements applicable to other emissions sources. This allows one source to increase emissions when another source reduces them, maintaining an overall constant emission level. Facilities that reduce emissions substantially may "bank" their "credits" or sell them to other facilities or industries.

Encapsulation: The treatment of asbestos-containing material with a liquid that covers the surface with a protective coating or embeds fibers in an adhesive matrix to prevent their release into the air.

Enclosure: Putting an airtight, impermeable, permanent barrier around asbestos-containing materials to prevent the release of asbestos fibers into the air.

Endangered Species: Animals, birds, fish, plants, or other living organisms threatened with extinction by man-made or natural changes in their environment. Requirements for declaring a species endangered are contained in the Endangered Species Act.

Endangerment Assessment: A study to determine the nature and extent of contamination at a site on the National Priorities List and the risks posed to public health or the environment. EPA or the state conduct the study when a legal action is to be taken to direct potentially responsible parties to clean up a site or pay for it. An endangerment assessment supplements a remedial investigation.

Endrin: A pesticide toxic to freshwater and marine aquatic life that produces adverse health effects in domestic water supplies.

Energy Recovery: Obtaining energy from waste through a variety of processes (e.g., combustion.)

Enforceable Requirements: Conditions or limitations in permits issued under the Clean Water Act (Section 402 or 404 that, if violated, could result in the issuance of a compliance order or initiation of a civil or criminal action under federal or applicable state laws. If a permit has not been issued, the term includes any requirement which, in the Regional Administrator's judgement, would be included in the permit when issued. Where no permit applies, the term includes any requirement which the RA determines is necessary for the best practical waste treatment technology to meet applicable criteria.

Enforcement: EPA, state, or local legal actions to obtain compliance with environmental laws, rules, regulations, or agreements and/or obtain penalties or criminal sanctions for violations. Enforcement procedures may vary, depending on the requirements of different environmental laws and related implementing regulations. Under CERCLA, for example, EPA will seek to require potentially responsible parties to clean up a Superfund site, or pay for the cleanup, whereas under the Clean Air Act the agency may invoke sanctions against cities failing to meet ambient air quality standards that could prevent certain types of construction or federal funding. In other situations, if investigations by EPA and state agencies uncover willful violations, criminal trials and penalties are sought.

Enforcement Decision Document (EDD): A document that provides an explanation to the public of EPA's selection of the cleanup alternative at enforcement sites on the National Priorities List. Similar to a Record of Decision.

Enhanced Inspection and Maintenance (I&M): An improved automobile inspection and maintenance program—aimed at reducing automobile emissions—that contains, at a minimum, more vehicle types and model years, tighter inspection, and better management practices. It may also include annual computerized or centralized inspections, under-

the-hood inspection- for signs of tampering with pollution control equipment, and increased repair waiver cost.

Enrichment: The addition of nutrients (e.g., nitrogen, phosphorus, carbon compounds) from sewage effluent or agricultural runoff to surface water; greatly increases the growth potential for algae and other aquatic plants.

Entrain: To trap bubbles in water either mechanically through turbulence or chemically through a reaction.

Environment: The sum of all external conditions affecting the life, development and survival of an organism.

Environmental Assessment: An environmental analysis prepared pursuant to the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require a more detailed environmental impact statement.

Environmental Audit: An independent assessment of the current status of a party's compliance with applicable environmental requirements or of a party's environmental compliance policies, practices, and controls.

Environmental Equity/Justice: Equal protection from environmental hazards for individuals, groups, or communities regardless of race, ethnicity, or economic status. This applies to the development, implementation, and enforcement of environmental laws, regulations, and policies, and implies that no population of people should be forced to shoulder a disproportionate share of negative environmental impacts.

Environmental Exposure: Human exposure to pollutants orginating from facility emissions. Threshold levels are not necessarily surpassed, but low-level chronic pollutant exposure is one of the most common forms of environmental exposure (See: threshold level).

Environmental Impact Statement: A document required of federal agencies by the National Environmental Policy Act for major projects or legislative proposals significantly affecting the environment. A tool for decision making, it describes the positive and negative effects of the undertaking and cites alternative actions.

Environmental Indicator: A measurement, statistic or value that provides a proximate gauge or evidence of the effects of environmental management programs or of the state or condition of the environment.

Environmental Response Team: EPA experts located in Edison, NJ, and Cincinnati, OH, who can provide around-the-clock technical assistance to EPA regional offices and states during all types of hazardous waste site emergencies and spills of hazardous substances.

Epidemiology: Study of the distribution of disease, or other health-related states and events in human populations, as related to age, sex, occupation, ethnic, and economic status in order to identify and alleviate health problems and promote better health.

Epilimnion: Upper waters of a thermally stratified lake subject to wind action.

Episode (Pollution): An air pollution incident in a given area caused by a concentration of atmospheric pollutants under meteorological conditions that may result in a significant increase in illnesses or deaths. May also describe water pollution events or hazardous material spills.

Equilibrium: In relation to radiation, the state at which the radioactivity of consecutive elements within a radioactive series is neither increasing nor decreasing.

Equivalent Method: Any method of sampling and analyzing for air pollution which has been demonstrated to the EPA Administrator's satisfaction to be, under specific conditions, an acceptable alternative to normally used reference methods.

Erosion: The wearing away of land surface by wind or water, intensified by land-clearing practices related to farming, residential, or industrial development, road building, or logging.

Estuary: Regions of interaction between rivers and near-shore ocean waters, where tidal action and river flow mix fresh and salt water. Such areas include bays, mouths of rivers, salt marshes, and lagoons. These brackish water ecosystems shelter and feed marine life, birds, and wildlife. (See: wetlands.)

Ethanol: An alternativce automotive fuel derived from grain and corn; usually blended with gasoline to form gasohol.

Ethylene Dibromide (EDB): A chemical used as an agricultural fumigant and in certain industrial processes. Extremely toxic and found to be a carcinogen in laboratory animals. EDB has been banned for most agricultural uses in the United States.

Eutrophic Lakes: Shallow, murky bodies of water with concentrations of plant nutrients causing excessive production of algae. (See: dystrophic lakes.)

Eutrophication: The slow aging process during which a lake, estuary, or bay evolves into a bog or marsh and eventually disappears. During the later stages of eutrophication the water body is choked by abundant plant life due to higher levels of nutritive compounds such as nitrogen and phosphorus. Human activities can accelerate the process.

Evaporation Ponds: Areas where sewage sludge is dumped and dried.

Evapotranspiration: The loss of water from the soil both by evaporation and by transpiration from the plants growing in the soil.

Exceedance: Violation of the pollutant levels permitted by environmental protection standards.

Exclusion: In the asbestos program, one of several situations that permit a Local Education Agency (LEA) to delete one or more of the items required by the Asbestos Hazard Emergency Response Act (AHERA), e.g., records of previous asbestos sample collection and analysis may be used by the accredited inspector in lieu of AHERA bulk sampling.

Exclusionary Ordinance: Zoning that excludes classes of persons or businesses from a particular neighborhood or area.

Exempt Solvent: Specific organic compounds not subject to requirements of regulation because they are deemed by EPA to be of negligible photochemical reactivity.

Exempted Aquifer: Underground bodies of water defined in the Underground Injection Control program as aquifers that are potential sources of drinking water though not being used as such, and thus exempted from regulations barring underground injection activities.

Exemption: A state (with primacy) may exempt a public water system from a requirement involving an MCL, treatment technique, or both, if the system cannot comply due to compelling economic or other factors, or because the

system was in operation before the requirement or MCL was instituted, and the exemption will not create a public health risk.

Exotic Species: A species that is not indigenous to a region.

Experimental Use Permit: Obtained by manufacturers for testing new pesticides or uses of thereof whenever they conduct experimental field studies to support registration on 10 acres or more on land or one acre or more of water.

Explosive Limits: The amounts of vapor in the air that form explosive mixtures; limits are expressed as lower and upper limits and give the range of vapor concentrations in air that will explode if an ignition source is present.

Exposure: The amount of radiation or pollutant present in a given environment that represents a potential health threat to living organisms.

Exposure Assessment: Identifying the pathways by which toxicants may reach individuals, estimating how much of a chemical an individual is likely to be exposed to, and estimating the number likely to be exposed.

Exposure Indicator: A characteristic of the environment measured to provide evidence of the occurrence or magnitude of a response indicator's exposure to a chemical or biological stress.

Exposure Level: The amount (concentration) of a chemical at the absorptive surfaces of an organism.

Extraction Procedure (E P Toxic): Determining toxicity by a procedure which simulates leaching; if a certain concentration of a toxic substance can be leached from a waste, that waste is considered hazardous, i.e., "E P Toxic."

Extremely Hazardous Substances: Any of 406 chemicals identified by EPA as toxic, and listed under SARA Title III. The list is subject to periodic revision.

F

Fabric Filter: A cloth device that catches dust particles from industrial emissions.

Facilities Plans: Plans and studies related to the construction of treatment works necessary to comply with the Clean Water Act or RCRA. A facilities plan investigates needs and provides information on the cost effectiveness of alternatives, a recommended plan, an environmental assessment of the recommendations, and descriptions of the treatment works, costs, and a completion schedule.

Facility Emergency Coordinator: Representative of a facility covered by environmental law (e.g, a chemical plant) who participates in the emergency reporting process with the Local Emergency Planning Committee (LEPC).

Facultative Bacteria: Bacteria that can live under aerobic or anaerobic conditions.

Feasibility Study: 1. Analysis of the practicability of a proposal; e.g., a description and analysis of potential cleanup alternatives for a site such as one on the National Priorities List. The feasibility study usually recommends selection of a cost-effective alternative. It usually starts as soon as the remedial investigation is underway; together, they are commonly referred to as the "RI/FS". 2. A small-scale investigation of a problem to ascertain whether a proposed research approach is likely to provide useful data.

Fecal Coliform Bacteria: Bacteria found in the intestinal tracts of mammals. Their presence in water or sludge is an indicator of pollution and possible contamination by pathogens.

Federal Implementation Plan: Under current law, a federally implemented plan to achieve attainment of air quality standards, used when a state is unable to develop an adequate plan.

Federal Motor Vehicle Control Program: All federal actions aimed at controlling pollution from motor vehicles by such efforts as establishing and enforcing tailpipe and evaporative emission standards for new vehicles, testing methods development, and guidance to states operating inspection and maintenance programs.

Feedlot: A confined area for the controlled feeding of animals. Tends to concentrate large amounts of animal waste that cannot be absorbed by the soil and, hence, may be carried to nearby streams or lakes by rainfall runoff.

Fen: A type of wetland that accumulates peat deposits. Fens are less acidic than bogs, deriving most of their water from groundwater rich in calcium and magnesium. (See: wetlands.)

FIFRA Pesticide Ingredient: An ingredient of a pesticide that must be registered with EPA under the Federal Insecticide, fungicide, and Rodenticide Act. Products making pesticide claims must register under FIFRA and may be subject to labeling and use requirements.

Filling: Depositing dirt, mud or other materials into aquatic areas to create more dry land, usually for agricultural or commercial development purposes, often with ruinous ecological consequences.

Filter Strip: Strip or area of vegetation used for removing sediment, organic matter, and other pollutants from runoff and waste water.

Filtration: A treatment process, under the control of qualified operators, for removing solid (particulate) matter from water by means of porous media such as sand or a man-made filter; often used to remove particles that containing pathogens.

Financial Assurance for Closure: Documentation or proof that an owner or operator of a facility such as a landfill or other waste repository is capable of paying the projected costs of closing the facility and monitoring it afterwards as provided in RCRA regulations.

Finding of No Significant Impact: A document prepared by a federal agency showing why a proposed action would not have a significant impact on the environment and thus would not require preparation of an Environmental Impact Statement. An FNSI is based on the results of an environmental assessment.

Finished Water: Water that has passed through all the processes in a water treatment plant and is ready to be delivered to consumers.

First Draw: The water that comes out when a tap is first opened, likely to have the highest level of lead contamination from plumbing materials.

Fix a Sample: A sample is "fixed" in the field by adding chemicals that prevent water quality indicators of interest in the sample from changing before laboratory measurements are made.

Flare: A control device that burns hazardous materials to prevent their release into the environment; may operate continuously or intermittently, usually on top a stack.

Floc: A clump of solids formed in sewage by biological or chemical action.

Flocculation: Process by which clumps of solids in water or sewage aggregate through biological or chemical action so

they can be separated from water or sewage.

Floodplain: The flat or nearly flat land along a river or stream or in a tidal arra that is covered by water during a flood.

Floor Sweep: Capture of heavier-than-air gases that collect at floor level.

Flow Rate: The rate, expressed in gallons-or liters-per-hour, at which a fluid escapes from a hole or fissure in a tank. Such measurements are also made of liquid waste, effluent, and surface water movement.

Flowmeter: A gauge indicating the velocity of wastewater moving through a treatment plant or of any liquid moving through various industrial processes.

Flue Gas Desulfurization: A technology that employs a sorbent, usually lime or limestone, to remove sulfur dioxide from the gases produced by burning fossil fuels. Flue gas desulfurization is current state-of-the art technology for major SO_2 emitters, like power plants.

Flue Gas: The air coming out of a chimney after combustion in the burner it is venting. It can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, particles and many chemical pollutants.

Fluidized: A mass of solid particles that is made to flow like a liquid by injection of water or gas is said to have been fluidized. In water treatment, a bed of filter media is fluidized by backwashing water through the filter.

Fluidized Bed Incinerator: An incinerator that uses a bed of hot sand or other granular material to transfer heat directly to waste. Used mainly for destroying municipal sludge.

Fluoridation: The addition of a chemical to increase the concentration of fluoride ions in drinking water to reduce the incidence of tooth decay in children.

Flume: A natural or man-made channel that diverts water.

Fluorides: Gaseous, solid, or dissolved compounds containing fluorine that result from industrial processes. Excessive amounts in food can lead to fluorosis.

Fluorocarbons (FCs): Any of a number of organic compounds analogous to hydrocarbons in which one or more hydrogen atoms are replaced by fluorine. Once used in the United States as a propellant for domestic aerosols, they are now found mainly in coolants and some industrial processes. FCs containing chlorine are called chlorofluorocarbons (CFCs). They are believed to be modifying the ozone layer in the stratosphere, thereby allowing more harmful solar radiation to reach the Earth's surface.

Flush: 1. To open a cold-water tap to clear out all the water which may have been sitting for a long time in the pipes. In new homes, to flush a system means to send large volumes of water gushing through the unused pipes to remove loose particles of solder and flux. 2. To force large amounts of water through liquid to clean out piping or tubing, storage or process tanks.

Flux: A flowing or flow.

Fly Ash: Non-combustible residual particles expelled by flue gas.

Fogging: Applying a pesticide by rapidly heating the liquid chemical so that it forms very fine droplets that resemble smoke or fog. Used to destroy mosquitoes, black flies, and similar pests.

Food Chain: A sequence of organisms, each of which uses the next, lower member of the sequence as a food source.

Formaldehyde: A colorless, pungent, and irritating gas, CH_2O, used chiefly as a disinfectant and preservative and in synthesizing other compounds like resins.

Formulation: The substances comprising all active and inert ingredients in a pesticide.

Fossil Fuel: Fuel drived from ancient organic remains, e.g., peat, coal, crude oil, and natural gas.

Freeboard: 1. Vertical distance from the normal water surface to the top of a confining wall. 2. Vertical distance from the sand surface to the underside of a trough in a sand filter.

Fresh Water: Water that generally contains less than 1,000 milligrams-per-liter of dissolved solids.

Friable Asbestos: Any material containing more than one percent asbestos, and that can be crumbled or reduced to powder by hand pressure. (May include previously non-friable material which becomes broken or damaged by mechanical force.)

Friable: Capable of being crumbled, pulverized, or reduced to powder by hand pressure.

Fuel Economy Standard: The Corporate Average Fuel Economy Standard (CAFE) effective since 1978. It enhanced the national fuel conservation effort imposing a miles-per-gallon floor for motor vehicles.

Fuel Efficiency: The proportion of energy released by fuel combustionton that is converted into useful energy.

Fuel Switching: 1. A precombustion process whereby a low-sulfur coal is used in place of a higher sulfur coal in a power plant to reduce sulfur dioxide emissions. 2. Illegally using leaded gasoline in a motor vehicle designed to use only unleaded.

Fugitive Emissions: Emissions not caught by a capture system.

Fume: Tiny particles trapped in vapor in a gas stream.

Fumigant: A pesticide vaporized to kill pests. Used in buildings and greenhouses.

Functional Equivalent: Term used to describe EPA's decision-making process and its relationship to the environmental review conducted under the National Environmental Policy Act (NEPA). A review is considered functionally equivalent when it addresses the substantive components of a NEPA review.

Fungi: (Singular: Fungus) Molds, mildews, yeasts, mushrooms, and puffballs, a group of organisms lacking in chlorophyll (i.e., are not photosynthetic) and which are usually non-mobile, filamentous, and multicellular. Some grow in soil, others attach themselves to decaying trees and other plants whence they obtain nutrients. Some are pathogens, others stabilize sewage and digest composted waste.

Fungicide: Pesticides which are used to control, deter, or destroy fungi.

Fungistat: A chemical that keeps fungi from growing.

Furrow Irrigation: Irrigation method in which water travels through the field by means of small channels between each row or groups of rows.

Future Liability: Refers to potentially responsible parties' obligations to pay for additional response activities beyond those specified in the Record of Decision or Consent Decree.

G

Game Fish: Species like trout, salmon, or bass, caught for sport. Many of

them show more sensitivity to environmental change than rough" fish.

Garbage: Animal and vegetable waste resulting from the handling, storage, sale, preparation, cooking, and serving of foods.

Gas Chromatograph/Mass Spectrometer: Highly sophisticated instrument that identifies the molecular composition and concentrations of various chemicals in water and soil samples.

Gasahol: Mixture of gasoline and ethanol derived from fermented agricultural products containing at least nine percent ethanol. Gasohol emissions contain less carbon monoxide than those from gasoline.

Gasification: Conversion of solid material such as coal into a gas for use as a fuel.

Gasoline Volatility: The property of gasoline whereby it evaporates into a vapor. Gasoline vapor is a volatile organic compound.

General Permit: A permit applicable to a class or category of dischargers.

General Reporting Facility: A facility having one or more hazardous chemicals above the 10,000 pound threshold for planning quantities. Such facilities must file MSDS and emergency inventory information with the SERC and LEPC and local fire departments.

Generator: 1. A facility or mobile source that emits pollutants into the air or releases hazardous waste into water or soil. 2. Any person, by site, whose act or process produces regulated medical waste or whose act first causes such waste to become subject to regulation. In a case where more than one person (e.g., doctors with separate medical practices) is located in the same building, each business entity is a separate generator.

Genetic Engineering: A process of inserting new genetic information into existing cells in order to modify any organism for the purpose of changing one of its characteristics.

Geographic Information System (GIS): A computer system designed for storing, manipulating, analyzing, and displaying data in a geographic context.

Geological Log: A detailed description of all underground features (depth, thickness, type of formations) discovered during the drilling of a well.

Geophysical Log: A record of the structure and composition of the earth encountered when drilling a well or similar type of test hold or boring.

Germicide: Any compound that kills disease-causing microorganisms.

Giardia Lamblia: Protozoan in the feces of man and animals that can cause severe gastrointestinal ailments when it contaminates drinking water.

Glovebag: A polyethylene or polyvinyl chloride bag-like enclosure affixed around an asbestos-containing source (most often thermal system insulation) permitting the material to be removed while minimizing release of airborne fibers in the surrounding atmosphere.

Gooseneck: A portion of a water service connection between the distribution system water main and a meter. Sometimes called a pigtail.

Grab Sample: A single sample collected at a particular time and place that represents the composition of the water only at that time and place.

Grain Loading: The rate at which particles are emitted from a pollution source. Measurement is made by the number of grains per cubic foot of gas emitted.

Granular Activated Carbon Treatment: A filtering system often used in small water systems and individual homes to remove organics. GAC can be highly effective in removing elevated levels of radon from water.

Grassed Waterway: Natural or constructed watercourse or outlet that is shaped or graded and established in suitable vegetation for the disposal of runoff water without erosion.

Gray Water: Domestic wastewater composed of wash water from kitchen, bathroom, and laundry sinks, tubs, and washers.

Greenhouse Effect: The warming of the Earth's atmosphere attributed to a build-up of carbon dioxide or other gases; some scientists think that this build-up allows the sun's rays to heat the Earth, while infra-red radiation makes the atmosphere opaque to a counterbalancing loss of heat.

Grinder Pump: A mechanical ...nce that shreds solids and raises sewage to a higher elevation through pressure sewers.

Ground Cover: Plants grown to keep soil from eroding.

Ground Water: The supply of fresh water found beneath the Earth's surface, usually in aquifers, which supply wells and springs. Because ground water is a major source of drinking water, there is growing concern over contamination from leaching agricultural or industrial pollutants or leaking underground storage tanks.

Ground-Water Discharge: Ground water entering near coastal waters which has been contaminated by landfill leachate, deep well injection of hazardous wastes, septic tanks, etc.

Ground Water Under the Direct Influence (UDI) of Surface Water: Any water beneath the surface of the ground with: 1. significant occurence of insects or other microorganims, algae, or large-diameter pathogens: 2. significant and relatively rapid shifts in water characteristcs such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence is determined for individual sources in accordance with criteria established by the state.

Gross Alpha/Beta Particle Activity: The total radioactivity due to alpha or beta particle emissions as inferred from measurements on a dry sample.

Gully Erosion: Severe erosion in which trenches are cut to a depth greater than 30 centimeters (a foot). Generally, ditches deep enough to cross with farm equipment are considered gullies.

H

Habitat: The place where a population (e.g., human, animal, plant, microorganism) lives and its surroundings, both living and non-living.

Habitat Indicator: A physical attribute of the environment measured to characterize conditions necessary to support an organism, population, or community in the absence of pollutants, e.g., salinity of esturarine waters or substrate type in streams or lakes.

Half-Life: 1. The time required for a pollutant to lose half its affect on the environment. For example, the biochemical half-life of DDT in the environment is 15 years, of Radium, 1,580 years. 2. The time required for half of the atoms of a radioactive element to undergo self-transmutation or decay. 3. The time required for the elimination of one half a total dose from the body.

Halon: Bromine-containing compounds with long atmospheric lifetimes whose breakdown in the stratosphere causes depletion of ozone. Halons are used in fire-fighting.

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Hammermill: A high-speed machine that uses hammers and cutters to crush, grind, chip, or shred solid waste.

Hard Water: Alkaline water containing dissolved salts that interfere with some industrial processes and prevent soap from sudsing.

Hauler: Garbage collection company that offers complete refuse removal service; many also will also collect recyclables.

Hazard Communication Standard: An OSHA regulation that requires chemical manufacturers, suppliers, and importers to assess the hazards of the chemicals that they make, supply, or import, and to inform employers, customers, and workers of these hazards through MSDS sheets.

Hazard Evaluation: A component of risk evaluation that involves gathering and evaluating data on the types of health injury or disease that may be produced by a chemical and on the conditions of exposure under which such health effects are produced.

Hazard Identification: Determining if a chemical can cause adverse health effects in humans and what those affects might be.

Hazardous Air Pollutants: Air pollutants which are not covered by ambient air quality standards but which, as defined in the Clean Air Act, may reasonably be expected to cause or contribute to irreversible illness or death. Such pollutants include asbestos, beryllium, mercury, benzene, coke oven emissions, radionuclides, and vinyl chloride.

Hazardous Chemical: An EPA designation for any hazardous material requiring an MSDS under OSHA's Hazard Communication Standard. Such substances are capable of producing fires and explosions or adverse health effects like cancer and dermatitis. Hazardous chemicals are distinct from hazardous waste. (See: hazardous waste.)

Hazardous Ranking System: The principle screening tool used by EPA to evaluate risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites. The HRS calculates a score based on the potential of hazardous substances spreading from the site through the air, surface water, or ground water, and on other factors such as density and proximity of human population. This score is the primary factor in deciding if the site should be on the National Priorities List and, if so, what ranking it should have compared to other sites on the list.

Hazardous Substance: 1. Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive. 2. Any substance designated by EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or if otherwise released into the environment.

Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Hazardous Waste Landfill: An excavated or engineered site where hazardous waste is deposited and covered.

Hazards Analysis: Procedures used to (1) identify potential sources of release of hazardous materials from fixed facilities or transportation accidents; (2) determine the vulnerability of a geographical area to a release of hazardous materials; and (3) compare hazards to determine which present greater or lesser risks to a community.

Hazards Identification: Providing information on which facilities have extremely hazardous substances, what those chemicals are, how much there is at each facility, how the chemicals are stored, and whether they are used at high temperatures.

Health Advisory Level: A non-regulatory, health-based reference level of chemical traces (usually in ppm) in drinking water at which there are no adverse health risks when ingested over various periods of time. Such levels are established for one day, 10 days, long-term and life-time exposure periods. They contain a wide margin of safety.

Health Assessment: An evaluation of available data on existing or potential risks to human health posed by a Superfund site. The Agency for Toxic Substances and Disease Registry (ATSDR) of the Department of Health and Human Services (DHHS) is required to perform such an assessment at every site on the National Priorities List.

Heat Island Effect: A "dome" of elevated temperatures over an urban area caused by structural and pavement heat fluxes, and pollutant emissions.

Heavy Metals: Metallic elements with high atomic weights, e.g., mercury, chromium, cadmium, arsenic, and lead; can damage living things at low concentrations and tend to accumulate in the food chain.

Heptachlor: An insecticide that was banned on some food products in 1975 and all of them 1978. It was allowed for use in seed treatment until 1983. More recently it was found in milk and other dairy products in Arkansas and Missouri where dairy cattle were illegally fed treated seed.

Herbicide: A chemical pesticide designed to control or destroy plants, weeds, or grasses.

Herbivore: An animal that feeds on plants.

Heterotrophic Organisms: Species that are dependent on organic matter for food.

High-Density Polyethylene: A material used to make plastic bottles and other products that produces toxic fumes when burned.

High-Level Radioactive Waste (HLW): Waste generated in core fuel of a nuclear reactor or by nuclear fuel reprocessing; is a serious threat to anyone who comes near the waste without shielding. (See: low-level radioactive waste.)

High-Level Nuclear Waste Facility: Plant designed to handle disposal of used nuclear fuel, high-level radioactive waste, and plutonium waste.

High-Line Jumpers: Pipes or hoses connected to fire hydrants and laid on top of the ground to provide emergency water service for an isolated portion of a distribution system.

High-Risk Community: A community located within the vicinity of numerous sites of facilities or other potential sources of environmental exposure/health hazards which may result in high levels of exposure to contaminants or pollutants.

Holding Pond: A pond or reservoir, usually made of earth, built to store polluted runoff.

Homeowner Water System: Any water system which supplies piped water to a single residence.

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Homogeneous Area: In accordance with Asbestos Hazard and Emergency Response Act (AHERA) definitions, an area of surfacing materials, thermal surface insulation, or miscellaneous material that is uniform in color and texture.

Hood Capture Efficiency: Ratio of the emissions captured by a hood and directed into a control or disposal device; expressed as a percent of all emissions.

Host: 1. In genetics, the organism, typically a bacterium, into which a gene from another organism is transplanted. 2. In medicine, an animal infected or parasitized by another organism.

Household Waste (Domestic Waste): Solid waste, composed of garbage and rubbish, which normally originated in a private home or apartment house. Domestic waste may contain a significant amount of toxic or hazardous waste.

Human Equivalent Dose: A dose which, when administered to humans, produces an effect equal to that produced by a dose in animals.

Human Exposure Evaluation: Describing the nature and size of the population exposed to a substance and the magnitude and duration of their exposure.

Human Health Risk: The likelihood that a given exposure or series of exposures may have or will damage the health of individuals.

Hydraulic Gradient: In general, the direction of groundwater flow due to changes in the depth of the water table.

Hydrocarbons (HC): Chemical compounds that consist entirely of carbon and hydrogen.

Hydrogen Sulfide (HS): Gas emitted during organic decomposition. Also a by-product of oil refining and burning. Smells like rotten eggs and, in heavy concentration, can kill or cause illness.

Hydrogeological Cycle: The natural process recycling water from the atmosphere down to (and through) the earth and back to the atmosphere again.

Hydrogeology: The geology of ground water, with particular emphasis on the chemistry and movement of water.

Hydrologic Cycle: Movement or exchange of water between the atmosphere and earth.

Hydrology: The science dealing with the properties, distribution, and circulation of water.

Hydrophilic: Having a strong affinity for water.

Hydrophobic: Having a strong aversion for water.

Hydropneumatic: A water system, usually small, in which a water pump is automatically controlled by the pressure in a compressed air tank.

Hypolimnion: Bottom waters of a thermally stratified lake. The hypolimnion of a eutrophic lake is usually low or lacking in oxygen.

I

Identification Code or EPA I.D. Number: The unique code assigned to each generator, transporter, and treatment, storage, or disposal facility by regulating agencies to facilitate identification and tracking of chemicals or hazardous waste.

Ignitable: Capable of burning or causing a fire.

Imhoff Cone: A clear, cone-shaped container used to measure the volume of settleable solids in a specific volume of water.

Immediately Dangerous to Life and Health (IDLH): The maximum level to which a healthy individual can be exposed to a chemical for 30 minutes and escape without suffering irreversible health effects or impairing symptoms. Used as a "level of concern." (See: level of concern.)

Impermeable: Not easily penetrated. The property of a material or soil that does not allow, or allows only with great difficulty, the movement or passage of water.

Impoundment: A body of water or sludge confined by a dam, dike, floodgate, or other barrier.

Incident Command Post: A facility located at a safe distance from an emergency site, where the incident commander, key staff, and technical representatives can make decisions and deploy emergency manpower and equipment.

Incident Command System (ICS): The organizational arrangement wherein one person, normally the Fire Chief of the impacted district, is in charge of an integrated, comprehensive emergency response organization and the emergency incident site, backed by an Emergency Operations Center staff with resources, information, and advice.

Incineration: A treatment technology invoiving destruction of waste by controlled burning at high temperatures, e.g., burning sludge to remove the water and reduce the remaining residues to a safe, non-burnable ash that can be disposed of safely on land, in some waters, or in underground locations.

Incineration at Sea: Disposal of waste by burning at sea on specially-designed incinerator ships.

Incinerator: A furnace for burning waste under controlled conditions.

Incompatible Waste: A waste unsuitable for mixing with another waste or material because it may react to form a hazard.

Indicator: In biology, an organism, species, or community whose characteristics show the presence of specific environmental conditions. 2. In chemistry, a substance that shows a visible change, usually of color, at a desired point in a chemical reaction. 3.A device that indicates the result of a measurement.

Indirect Discharge: Introduction of pollutants from a non-domestic source into a publicly owned waste-treatment system. Indirect dischargers can be commercial or industrial facilities whose wastes enter local sewers.

Indirect Source: Any facility or building, property, road or parking area that attracts motor vehicle traffic and, indirectly, causes pollution.

Indoor Air: The breathing air inside a habitable structure or conveyance.

Indoor Air Pollution: Chemical, physical, or biological contaminants in indoor air.

Indoor Climate: Temperature, humidity, lighting, and noise levels in a habitable structure or conveyance. Indoor climate can affect indoor air pollution.

Industrial Pollution Prevention: Combination of industrial source reduction and toxic chemical use substitution

Industrial Source Reduction: Practices that reduce the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment; also reduces the threat to public health and the environment associated with such releases. Term includes equipment or technology modifications,

substitution of raw materials, and improvements in housekeeping, maintenance, training or inventory control.

Industrial Waste: Unwanted materials from an industrial operation; may be liquid, sludge, solid, or hazardous waste.

Inert Ingredient: Pesticide components such as solvents, carriers, dispersants,and surfactants that are not active against target pests. Not all inert ingredients are innocuous.

Inertial Separator: A device that uses centrifugal force to separate waste particles.

Infectious Agent: Any organism, such as a virus or bacterium, that is pathogenic and capable of being communicated by invasion and multiplication in body tissues.

Infectious Waste: Hazardous waste with infectious characteristics, including: contaminated animal waste; human blood and blood products; isolation waste, pathological waste; and discarded sharps (needles, scalpels or broken medical instruments.)

Infiltration: 1. The penetration of water through the ground surface into sub-surface soil or the penetration of water from the soil into sewer or other pipes through defective joints, connections, or manhole walls. 2. The technique of applying large volumes of waste water to land to penetrate the surface and percolate through the underlying soil. (See: percolation.)

Infiltration Gallery: A sub-surface groundwater collection system, typically shallow in depth, constructed with open-jointed or perforated pipes that discharge collected water into a watertight chamber from which the water is pumped to treatment facilities and into the distribution system. Usually located close to streams or ponds.

Infiltration Rate: The quantity of water than can enter the soil in a specified time interval.

Inflow: Entry of extraneous rain water into a sewer system from sources other than infiltration, such as basement drains, manholes, storm drains, and street washing.

Influent: Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant.

Information File: In the Superfund program, a file that contains accurate, up-to-date documents on a Superfund site. The file is usually located in a public building (school, library, or city hall) convenient for local residents.

Initial Compliance Period(water): The first full three-year compliance period which begins at least 18 months after promulgation.

Injection Well: A well into which fluids are injected for purposes such as waste disposal, improving the recovery of crude oil, or solution mining.

Injection Zone: A geological formation receiving fluids through a well.

In-Line Filtration: Pre-treatment method in which chemicals are mixed by the flowing water; commonly used in pressure filtration installations. Eliminates need for flocculation and sedimentation.

Innovative Technologies: New or inventive methods to treat effectively hazardous waste and reduce risks to human health and the environment.

Inoculum: 1. Bacterium placed in compost to start biological action. 2. A medium containing organisms that is introduced into cultures or living organisms.

Inorganic Chemicals: Chemical substances of mineral origin, not of basically carbon structure.

Insecticide: A pesticide compound specifically used to kill or prevent the growth of insects.

Inspection and Maintenance (I/M): 1. Activities to assure that vehicles' emissions-controls work properly. 2. Also applies to wastewater treatment plants and other anti-pollution facilities and processes.

Instream Use: Water use taking place within a stream channel, e.g., hydroelectric power generation, navigation, water quality improvement, fish propagation, recreation.

In-Situ Stripping: Treatment system that remove or "strips" volatile organic compounds from contaminated ground or surface water by forcing an airstream through the water and causing the compounds to evaporate.

Integrated Exposure Assessment: Cumulative summation (over time) of the magnitude of exposure to a toxic chemical in all media.

Integrated Pest Management (IPM): A mixture of chemical and other, non-pesticide, methods to control pests.

Integrated Waste Management: Using a variety of practices to handle municipal solid waste; can include source reduction, recycling, incineration, and landfilling.

Interceptor Sewers: Large sewer lines that, in a combined system, control the flow of sewage to the treatment plant. In a storm, they allow some of the sewage to flow directly into a receiving stream, thus keeping it from overflowing onto the streets. Also used in separate systems to collect the flows from main and trunk sewers and carry them to treatment points.

Interface: The common boundary between two substances such as a water and a solid, water and a gas, or two liquids such as water and oil.

Interim (Permit) Status: Period during which treatment, storage and disposal facilities coming under RCRA in 1980 are temporarily permitted to operate while awaiting a permanent permit. Permits issued under these circumstances are usually called "Part A" or "Part B" permits.

Interstate Carrier Water Supply: A source of water for drinking and sanitary use on planes, buses, trains, and ships operating in more than one state. These sources are federally regulated.

Interstate Commerce Clause: A clause of the U.S. Constitution which reserves to the federal government the right to regulate the conduct of business across state lines. Under this clause, for example, the U.S. Supreme Court has ruled that states may not inequitably restrict the disposal out-of-state wastes in their jurisdictions.

Interstate Waters: Waters that flow across or form part of state or international boundaries, e.g., the Great Lakes, the Mississippi River, or coastal waters.

Interstitial Monitoring: The continuous surveillance of the space between the walls of an underground storage tank.

Inventory (TSCA): Inventory of chemicals produced pursuant to Section 8 (b) of the Toxic Substances Control Act.

Inversion: A layer of warm air preventing the rise of cooling air and pollutants trapped beneath it. Can cause an air pollution episode.

Ion: An electrically charged atom that can be drawn from waste water during electrodialysis.

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Ion Exchange Treatment: A common water-softening method often found on a large scale at water purification plants that remove some organics and radium by adding calcium oxide or calcium hydroxide to increase the pH to a level where the metals will precipitate out.

Ionization Chamber: A device that measures the intensity of ionizing radiation.

Ionizing Radiation: Radiation that can strip electrons from atoms, i.e., alpha, beta, and gamma radiation.

Irradiated Food: Food subject to brief radioactivity, usually gamma rays, to kill insects, bacteria, and mold, and to permit storage without refrigeration.

Irradiation: Exposure to radiation of wavelengths shorter than those of visible light (gamma, x-ray, or ultraviolet), for medical purposes, to sterilize milk or other foodstuffs, or to induce polymerization of monomers or vulcanization of rubber.

Irreversible Effect: Effect characterized by the inability of the body to partially or fully repair injury caused by a toxic agent.

Irrigation: Applying water or wastewater to land areas to supply the water and nutrient needs of plants.

Irrigation Efficiency: The amount of water stored in the crop root zone compared to the amount of irrigation water applied.

Irrigation Return Flow: Surface and subsurface water which leaves the field following application of irrigation water.

Irritant: A substance that can cause irritation of the skin, eyes, or respiratory system. Effects may be acute from a single high-level exposure, or chronic from repeated low-level exposures to such compounds as chlorine, nitrogen dioxide, and nitric acid.

Isotope: A variation of an element that has the same atomic number of protons but a different weight because of the number of neutrons. Various isotopes of the same element may have different radioactive behaviors, some are highly unstable..

J

Jar Test: A laboratory procedure that simulates a water treatment plant's coagulation/flocculation units with differing chemical doses, mix speeds, and settling times to estimate the minimum or ideal coagulant dose required to achieve certain water quality goals.

K

Karst: A geologic formation of irregular limestone deposits with sinks, underground streams, and caverns.

Kinetic Energy: Energy possessed by a moving body of water as a result of its motion.

Kinetic Rate Coefficient: A number that describes the rate at which a water constituent such as a biochemical oxygen demand or dissolved oxygen rises or falls.

L

Lagoon: 1. A shallow pond where sunlight, bacterial action, and oxygen work to purify wastewater; also used for storage of wastewater or spent nuclear fuel rods. 2. Shallow body of water, often separated from the sea by coral reefs or sandbars.

Land Application: Discharge of wastewater onto the ground for treatment or reuse. (See: irrigation.)

Land Ban: Phasing out of land disposal of most untreated hazardous wastes, as mandated by the 1984 RCRA amendments.

Land Farming (of waste): A disposal process in which hazardous waste deposited on or in the soil is degraded naturally by microbes.

Landfills: 1. Sanitary landfills are disposal sites for non-hazardous solid wastes spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day. 2. Secure chemical landfills are disposal sites for hazardous waste, selected and designed to minimize the chance of release of hazardous substances into the environment.

Landscape: The traits, patterns, and structure of a specific geographic area, including its biological composition, its physical environment, and its anthropogenic or social patterns. An area where interacting ecosystems are grouped and repeated in similar form.

Landscape Characterization: Documentation of the traits and patterns of the essential elements of the landscape.

Landscape Ecology: The study of the distribution patterns of communities and ecosystems, the ecological processes that affect those patterns, and changes in pattern and process over time.

Landscape Indicator: A measurement of the landscape, calculated from mapped or remotely sensed data, used to describe spatial patterns of land use and land cover across a geographic area. Landscape indicators may be useful as measures of certain kinds of environmental degradation such as forest fragmentation.

Langelier Index (LI): An index reflecting the equilibrium pH of a water with respect to calcium and alkalinity; used in stabilizing water to control both corrosion and scale deposition.

Large Quantity Generator: Person or facility generating more than 2200 pounds of hazardous waste per month. Such generators produce about 90 percent of the nation's hazardous waste, and are subject to all RCRA requirements.

Large Water System: A water system that services more than 50,000 customers.

Latency: Time from the first exposure of a chemical until the appearance of a toxic effect.

Lateral Sewers: Pipes that run under city streets and receive the sewage from homes and businesses, as opposed to domestic feeders and main trunk lines.

Laundering Weir: Sedimention basin overflow weir.

LC50/Lethal Concentration: Median level concentration, a standard measure of toxicity. It tells how much of a substance is needed to kill half of a group of experimental organisms in a given time. (See: LD50.)

LD 50/ Lethal Dose: The dose of a toxicant that will kill 50 percent of the test organisms within a designated period. The lower the LD 50, the more toxic the compound.

Leachate: Water that collects contaminants as it trickles through wastes, pesticides or fertilizers. Leaching may occur in farming areas, feedlots, and landfills, and may result in hazardous substances entering surface water, ground water, or soil.

Leachate Collection System: A system that gathers leachate and pumps it to the surface for treatment.

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Leaching: The process by which soluble constituents are dissolved and filtered through the soil by a percolating fluid. (See: leachate.)

Lead (Pb): A heavy metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by federal laws and regulations. (See: heavy metals.)

Lead Service Line: A service line made of lead which connects the water to the building inlet and any lead fitting connected to it.

Legionella: A genus of bacteria, some species of which have caused a type of pneumonia called Legionaires Disease.

Level of Concern (LOC): The concentration in air of an extremely hazardous substance above which there may be serious immediate health effects to anyone exposed to it for short periods **Lifetime Exposure:** Total amount of exposure to a substance that a human would receive in a lifetime (usually assumed to be 70 years).

Lift: In a sanitary landfill, a compacted layer of solid waste and the top layer of cover material.

Lifting Station: (See: pumping station.)

Limestone Scrubbing: Use of a limestone and water solution to remove gaseous stack-pipe sulfur before it reaches the atmosphere.

Limited Degradation: An environmental policy permitting some degradation of natural systems but terminating at a level well beneath an established health standard.

Limiting Factor: A condition whose absence or excessive concentration, is incompatible with the needs or tolerance of a species or population and which may have a negative influence on their ability to thrive, survive.

Limnology: The study of the physical, chemical, hydrological, and biological aspects of fresh water bodies.

Lindane: A pesticide that causes adverse health effects in domestic water supplies and is toxic to freshwater fish and aquatic life.

Liner: 1. A relatively impermeable barrier designed to keep leachate inside a landfill. Liner materials include plastic and dense clay. 2. An insert or sleeve for sewer pipes to prevent leakage or infiltration.

Lipid Solubility: The maximum concentration of a chemical that will dissolve in fatty substances. Lipid soluble substances are insoluble in water. They will very selectively disperse through the environment via uptake in living tissue.

Liquefaction: Changing a solid into a liquid.

Liquid Injection Incinerator: Commonly used system that relies on high pressure to prepare liquid wastes for incineration, breaking them up into tiny droplets to allow easier combustion.

List: Shorthand term for EPA list of violating facilities or firms debarred from obtaining government contracts because they violated certain sections of the Clean Air or Clean Water Acts. The list is maintained by The Office of Enforcement and Compliance Monitoring.

Listed Waste: Wastes listed as hazardous under RCRA but which have not been subjected to the Toxic Characteristics Listing Process because the dangers they present are considered self-evident.

Litter: The highly visible portion of solid waste carelessly discarded outside the regular garbage and trash collection and disposal system.

Littoral Zone: 1. That portion of a body of fresh water extending from the shoreline lakeward to the limit of occupancy of rooted plants. 2. A strip of land along the shoreline between the high and low water levels.

Local Education Agency (LEA): In the asbestos program, an educational agency at the local level that exists primarily to operate schools or to contract for educational services, including primary and secondary public and private schools. A single, unaffiliated school can be considered an LEA for AHERA purposes.

Local Emergency Planning Committee (LEPC): A committee appointed by the State Emergency Response Commission, as required by SARA Title III, to formulate a comprehensive emergency plan for its jurisdiction.

Low NO_x Burners: One of several combustion technologies used to reduce emissions of Nitrogen Oxides (NO^x.)

Lowest-Observed-Adverse-Effect Level: The lowest dose in an experiment which produced an observable adverse effect.

Low-Level Radioactive Waste (LLRW): Wastes less hazardous than most of those associated with nuclear reactor: generated by hospitals, research laboratories, and certain industries. The Department of Energy, Nuclear Regulatory Commission, and EPA share responsibilities for managing them. (See: high-level radioactive wastes.)

Lower Explosive Limit (LEL): The concentration of a compound in air below which the mixture will not catch on fire.

Lowest Achievable Emission Rate: Under the Clean Air Act, the rate of emissions that reflects (1) the most stringent emission limitation in the implementation plan of any state for such source unless the owner or operator demonstrates such limitations are not achievable; or (2) the most stringent emissions limitation achieved in practice, whichever is more stringent. A proposed new or modified source may not emit pollutants in excess of existing new source standards.

M

Magnetic Separation: Use of magnets to separate ferrous materials from mixed municipal waste stream.

Managerial Controls: Methods of nonpoint source pollution control based on decisions about managing agricultural wastes or application times or rates for agrochemicals.

Mandatory Recycling: Programs which by law require consumers to separate trash so that some or all recyclable materials are recovered for recycling rather than going to landfills.

Man-Made Beta Particle and Photon Emitters: All radionuclides emitting beta particles and/or photons listed in Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and Water for Occupational Exposure.

Manual Separation: Hand sorting of reyclable or compostable materials in waste.

Major Modification: This term is used to define modifications of major stationary sources of emissions with respect to Prevention of Significant Deterioration and New Source Review under the Clean Air Act.

Major Stationary Sources: Term used to determine the applicability of Prevention of Significant Deterioration

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and new source regulations. In a nonattainment area, any stationary pollutant source with potential to emit more than 100 tons per year is considered a major stationary source. In PSD areas the cutoff level may be either 100 or 250 tons, depending upon the source.

Majors: Larger publicly owned treatment works (POTWs) with flows equal to at least one million gallons per day (mgd) or servicing population equivalent to 10,000 persons; certain other POTWs having significant water quality impacts. (See: minors.)

Management Plan: Under the Asbestos Hazard Emergency Response Act (AHERA), a document that each Local Education Agency is required to prepare, describing all activities planned and undertaken by a school to comply with AHERA regulations, including building inspections to identify asbestos-containing materials, response actions, and operations and maintenance programs to minimize the risk of expo[illegible]

Man[illegible] System: [illegible]acking of hazardous [illegible]te from [illegible]ale to grave" (generation through disposal) with accompanying documents known as manifests. (See: cradle to grave.)

Manual Separation: Hand separation of compostable or recyclable material from waste.

Manufacturers Formulation: A list of substances or component parts as described by the maker of a coating, pesticide, or other product containing chemicals or other substances.

Margin of Safety: Maximum amount of exposure producing no measurable effect in animals (or studied humans) divided by the actual amount of human exposure in a population.

Marine Sanitation Device: Any equipment or process installed on board a vessel to receive, retain, treat, or discharge sewage.

Marsh: A type of wetland that does not accumulate appreciable peat deposits and is dominated by herbaceous vegetation. Marshes may be either fresh or saltwater, tidal or non-tidal. (See: wetlands.)

Material Category: In the asbestos program, broad classification of materials into thermal surfacing insulation, surfacing material, and miscellaneous material.

Materials Recovery Facility: A facility that processes residentially collected mixed recyclables into new products available for market.

Material Type: classification of suspect material by its specific use or application, e.g., pipe insulation, fireproofing, and floor tile.

Material Safety Data Sheet (MSDS): A compilation of information required under the OSHA Communication Standard on the identity of hazardous chemicals, health, and physical hazards, exposure limits, and precautions. Section 311 of SARA requires facilities to submit MSDSs under certain circumstances.

Materials Recovery Facility (MRF): Facility that processes residentially collected mixed recyclables into new products.

Maximum Contaminant Level: The maximum permissible level of a contaminant in water delivered to any user of a public system. MCLs are enforceable standards.

Maximum Contaminant Level Goal (MCLG): Under the Safe Drinking Water Act, a non-enforceable concentration of a drinking water contaminant, set at the level at which no known or anticipated adverse effects on human health occur and which allows an adequate safety margin. The MCLG is usually the starting point for determining the regulated Maximum Contaminant Level. (See: Maximum Contaminant Level.)

Maximum Tolerated Dose: The maximum dose that an animal species can tolerate for a major portion of its lifetime without significant impairment or toxic effect other than carcinogenicity.

Mechanical Aeration: Use of mechanical energy to inject air into water to cause a waste stream to absorb oxygen.

Mechanical Separation: Using mechanical means to separate waste into various components.

Mechanical Turbulence: Random irregularities of fluid motion in air caused by buildings or other non-thermal, processes.

Media: Specific environments-air, water, soil-which are the subject of regulatory concern and activities.

Medical Surveillance: A periodic comprehensive review of a worker's health status; acceptable elements of such surveillance program are listed in the Occupational Safety and Health Administration standards for asbestos.

Medical Waste: Any solid waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals, excluding hazardous waste identified or listed under 40 CFR Part 261 or any household waste as defined in 40 CFR Sub-section 261.4 (b)(1)).

Medium-size Water System: A water system that serves 3,300 to 50,000 customers.

Meniscus: The curved top of a column of liquid in a small tube.

Mercury: A heavy metal that can accumulate in the environment and is highly toxic if breathed or swallowed. (See: heavy metals.)

Mesotrophic: Reservoirs and lakes which contain moderate quantities of nutrients and are moderately productive in terms of aquatic animal and plant life.

Metabolites: Any substances produced by biological processes, such as those from pesticides.

Metalimnion: The middle layer of a thermally stratified lake or reservoir. In this layer there is a rapid decrease in temperature with depth. Also called thermocline.

Methane: A colorless, nonpoisonous, flammable gas created by anaerobic decomposition of organic compounds.

Methanol: An alcohol that can be used as an alternative fuel or as a gasoline additive. It is less volatile than gasoline; when blended with gasoline it lowers the carbon monoxide emissions but increases hydrocarbon emissions. Used as pure fuel, its emissions are less ozone-forming than those from gasoline.

Method 18: An EPA test method which uses gas chromatographic techniques to measure the concentration of volatile organic compounds in a gas stream.

Method 24: An EPA reference method to determine density, water content and total volatile content (water and VOC) of coatings.

Method 25: An EPA reference method to determine the VOC concentration in a gas stream.

Methoxychlor: Pesticide that causes adverse health effects in domestic water supplies and is toxic to freshwater and marine aquatic life.

Methyl Orange Alkalinity: A measure of the total alkalinity in a water sam-

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ple in wich the color of methyl orange reflects the change in level.

Microbial Growth: The activity and growth of microorganisms such as bacteria, algae, diatoms, plankton, and fungi.

Microclimate: The localized climate conditions within an urban area or neighborhood.

Microbial Pesticide: A microorganism that is used to control a pest, but of minimum toxicity to man.

Million-gallons Per Day (MGD): A measure of water flow.

Minimization: A comprehensive program to minimize or eliminate wastes, usually applied to wastes at their point of origin. (See: waste minimization.)

Mining of an Aquifer: Withdrawal over a period of time of ground water that exceeds the rate of recharge of the aquifer.

Minors: Publicly owned treatment works with flows less than 1 million gallons per day. (See: majors.)

Miscellaneous ACM: Interior asbestos-containing building material or structural components, members or fixtures, such as floor and ceiling tiles; does not include surfacing materials or thermal system insulation.

Miscellaneous materials: Interior building materials on structural components, such as floor or ceiling tiles.

Miscible Liquids: Two or more liquids that can be mixed and will remain mixed under normal conditions.

Missed Detection: The situation that occurs when a test indicates that a tank is "tight" when in fact it is leaking.

Mist: Liquid particles measuring 40 to 500 microns, formed by condensation of vapor. By comparison, fog particles are smaller than 40 microns.

Mitigation: Measures taken to reduce adverse impacts on the environment.

Mixed Funding: Settlements in which potentially responsible parties and EPA share the cost of a response action.

Mixed Liquor: A mixture of activated sludge and water containing organic matter undergoing activated sludge treatment in an aeration tank.

Mobile Incinerator Systems: Hazardous waste incinerators that can be transported from one site to another.

Mobile Source: Any non-stationary source of air pollution such as cars, trucks, motorcycles, buses, airplanes, locomotives.

Model Plant: A hypothetical plant design used for developing economic, environmental, and energy impact analyses as support for regulations or regulatory guidelines; first step in exploring the economic impact of a potential NSPS.

Modified Source: The enlargement of a major stationery pollutant sources is often referred to as modification, implying that more emissions wil occur.

Molecule: The smallest division of a compound that still retains or exhibits all the properties of the substance.

Molten Salt Reactor: A thermal treatment unit that rapidly heats waste in a heat-conducting fluid bath of carbonate salt.

Monitoring: Periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements and/or pollutant levels in various media or in humans, plants, and animals.

Monitoring Well: 1. A well used to obtain water quality samples or measure groundwater levels. 2. Well drilled at a hazardous waste management facility or Superfund site to collect ground-water samples for the purpose of physical, chemical, or biological analysis to determine the amounts, types, and distribution of contaminants in the ground water beneath the site.

Monoclonal Antibodies: (Also called MABs and MCAs) 1. Man-made clones of a molecule, produced in quantity for medical or research purposes. 2. Molecules of living organisms that selectively find and attach to other molecules to which their structure conforms exactly. This could also apply to equivalent activity by chemical molecules.

Monomictic: Lakes and reservoirs which are relatively deep, do not freeze over during winter, and undergo a single stratification and mixing cycle during the year (usually in the fall).

Moratorium: During the negotiation process, a period of 60 to 90 days during which EPA and potentially responsible parties may reach settlement but no site response activities can be conducted.

Morbidity: Rate of disease incidence.

Most Probable Number: The most probable number of coliform-group organisms per unit of volume of a water sample

Muck Soils: Earth made from decaying plant materials.

Mudballs: Round material that forms in filters and gradually increases in size when not removed by backwashing.

Mulch: A layer of material (wood chips, straw, leaves, etc.) placed around plants to hold moisture, prevent weed growth, and enrich or sterilize the soil.

Multiple Use: Use of land for more than one purpose; i.e., grazing of livestock, watershed and wildlife protection, recreation, and timber production. Also applies to use of bodies of water for recreational purposes, fishing, and water supply.

Multistage Remote Sensing: A strategy for landscape characterization that involves gathering and analyzing information at several geographic scales, ranging from generalized levels of detail at the national level through high levels of detail at the local scale.

Municipal Discharge: Discharge of effluent from waste water treatment plants which receive waste water from households, commercial establishments, and industries. Combined sewer/separate storm overflows are included in this category.

Municipal Sewage: Wastes (mostly liquid) orginating from a community; may be composed of domestic wastewaters and/or industrial discharges.

Mutagen/Mutagenicity: An agent that causes a permanent genetic change in a cell other than that which occurs during normal growth. Mutagenicity is the capacity of a chemical or physical agent to cause such permanent changes.

N

National Ambient Air Quality Standards (NAAQS): Standards established by EPA that apply for outside air throughout the country. (See: criteria pollutants, state implementation plans, emissions trading.)

National Emissions Standards For Hazardous Air Pollutants (NESHAPS): Emissions standards set by EPA for an air pollutant not covered by NAAQS that may cause an increase in fatalities or in serious, irreversible, or inca-

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pacitating illness. Primary standards are designed to protect human health, secondary standards to protect public welfare (e.g., building facades, visibility, crops, and domestic animals).

National Estuary Program: A program established under the Clean Water Act Amendments of 1987 to develop and implement conservation and management plans for protecting estuaries and restoring and maintaining their chemical, physical, and biological integrity, as well as controlling point and nonpoint pollution sources.

National Interim Primary Drinking Water Regulations: Commonly referred to as NIPDWRs.

National Municipal Plan: A policy created in 1984 by EPA and the states to bring all publicly owned treatment works (POTWs) into compliance with Clean Water Act requirements.

National Oil and Hazardous Substances Contingency Plan (NOHSCP/NCP): The federal regulation that guides determination of the sites to be corrected under both the Superfund program and the program to prevent or control spills into surface waters or elsewhere.

National Pollutant Discharge Elimination System (NPDES): A provision of the Clean Water Act which prohibits discharge of pollutants into waters of the United States unless a special permit is issued by EPA, a state, or, where delegated, a Native American tribal government.

National Priorities List (NPL): EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. The list is based primarily on the score a site receives from the Hazard Ranking System. EPA is required to update the NPL at least once a year. A site must be on the NPL to receive money from the Trust Fund for remedial action.

National Response Team (NRT): Representatives of 13 federal agencies that, as a team, coordinate federal responses to nationally significant incidents of pollution (an oil spill, a major chemical release, or a Superfund response action) and provide advice and technical assistance to the responding agency(ies) before and during a response action.

National Response Center: The federal operations center that receives notifications of all releases of oil and hazardous substances into the environment; open 24 hours a day, is operated by the U.S. Coast Guard, which evaluates all reports and notifies the appropriate agency.

National Secondary Drinking Water Regulations: Commonly referred to as NSDWRs.

Navigable Waters: Traditionally, waters sufficiently deep and wide for navigation by rail, or specified vessels; such waters in the United States come under federal jurisdiction and are protected by certain provisions of the Clean Water Act.

Necrosis: Death of plant or animal cells or tissues. In plants, necrosis can discolor stems or leaves or kill a plant entirely.

Negotiations: (Under Superfund) After potentially responsible parties are identified for a site, EPA coordinates with them to reach a settlement that will result in the PRP paying for or conducting the cleanup under EPA supervision. If negotiations fail, EPA can order the PRP to conduct the cleanup or EPA can pay for the cleanup using Superfund monies and then sue to recover the costs.

Nematocide: A chemical agent which is destructive to nematodes.

Nephelometric: Method of of measuring turbidity in a water sample by passing light through the sample and measuring the amount of the light that is deflected.

Netting: A concept in which all emissions sources in the same area that are owned or controlled by a single company are treated as one large source, thereby allowing flexibility in controlling individual sources in order to meet a single emissions standard. (See: bubble)

Neutralization: Decreasing the acidity or alkalinity of a substance by adding alkaline or acidic materials, respectively.

New Source: Any stationary source built or modified after publication of final or proposed regulations that prescribe a given standard of performance.

New Source Performance Standards (NSPS): Uniform national EPA air emission and water effluent standards which limit the amount of pollution allowed from new sources or from modified existing sources.

New Source Review (NSR): Clean Air Act requirement that State Implementation Plans must include a permit review that applies to the construction and operation of new and modified stationary sources in nonattainment areas to assure attainment of national ambient air quality standards.

Nitrate: A compound containing nitrogen that can exist in the atmosphere or as a dissolved gas in water and which can have harmful effects on humans and animals. Nitrates in water can cause severe illness in infants and domestic animals. A plant nutrient and inorganic fertilizer, nitrate is found in septic systems, animal feed lots, agricultural fertilizers, manure, industrial waste waters, sanitary landfills, and garbage dumps.

Nitric Oxide (NO): A gas formed by combustion under high temperature and high pressure in an internal combustion engine; changes into nitrogen dioxide in the ambient air and contributes to photochemical smog.

Nitrification: The process whereby ammonia in wastewater is oxidized to nitrite and then to nitrate by bacterial or chemical reactions.

Nitrilotriacetic Acid (NTA): A compound now replacing phosphates in detergents.

Nitrite: 1. An intermediate in the process of nitrification. 2. Nitrous oxide salts used in food preservation

Nitrogen Dioxide (NO_2): The result of nitric oxide combining with oxygen in the atmosphere; major component of photochemical smog.

Nitrogen Oxide (NO_x): Product of combustion from transportation and stationary sources and a major contributor to the formation of ozone in the troposphere and to acid deposition.

Nitrogenous Wastes: Animal or vegetable residues that contain significant amounts of nitrogen.

Nitrophenols: Synthetic organopesticides containing carbon, hydrogen, nitrogen, and oxygen.

Noble Metal: Chemically inactive metal such as gold; does not corrode easily.

No Further Remedial Action Planned: Determination made by EPA following a preliminary assessment that a site does not pose a significant risk and so requires no further activity under CERCLA.

Noise: Product-level or product-volume changes occurring during a test that are not related to a leak but may be mistaken for one.

Non-Attainment Area: Area that does not meet one or more of the National

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Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

Non-Binding Allocations of Responsibility (NBAR): Process for EPA to propose a way for potentially responsible parties to allocate costs among themselves.

Non-Community Water System: A public water system that is not a community water system, e.g., the water supply at a camp site or national park.

Non-Compliance Coal: Any coal that emits greqter than 3.0 pounds of sulfur dioxide per million BTU when burned. Also known as high-sulfur coal.

Non-Contact Cooling Water: Water used for cooling which does not come into direct contact with any raw material, product, byproduct, or waste.

Non-Conventional Pollutant: Any pollutant not statutorily listed or which is poorly understood by the scientific community.

Non-degradation: An environmental policy which disallows any lowering of naturally occurring quality regardless of preestablished health standards.

Nondischarging Treatment Plant: A treatment plant that does not discharge treated wastewater into any stream or river. Most are pond systems that dispose of the total flow they receive by means of evaporation or percolation to groundwater, or facilities that dispose of their effluent by recycling or reuse (e.g., spray irrigation or groundwater discharge).

Nonfriable Asbestos-containing Materials: Any material containing more than one percent asbestos (as determined by Polarized Light Microscopy) that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Non-ionizing Electromagnetic Radiation: 1. Radiation that does not change the structure of atoms, but does heat tissue and may cause harmful biological effects. 2. Microwaves, radio waves, and low-frequency electromagnetic fields from high-voltage transmission lines.

Non-Point Source: Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by storm water. Common nonpoint sources are agriculture, forestry, urban, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

Non-potable: Water that is unsafe or unpalatable to drink because it contains pollutants, contaminants, minerals, or infective agents.

Non-Road Emissions: Pollutants emitted by combustion engines on farm and construction equipment, gasoline-powered lawn and garden equipment, and power boats and outboard motors.

Non-Transient Non-Community Water System: A public water system that regularly serves at least 25 of the same non-resident persons per day for more than six months per year.

No Observable Adverse Effect Level (NOAEL): From long-term toxicological studies of agricultural chemical active ingredients, levels which indicate a safe, lifetime exposure level for a given chemical.

Notice of Deficiency: An EPA request to a facility owner or operator requesting additional information before a preliminary decision on a permit application can be made.

Notice of Intent to Deny: Notification by EPA of its preliminary intent to deny a permit application.

No Till: Planting crops without prior seedbed preparation, into an existing cover crop, sod, or crop residues, and eliminating subsequent tillage operations.

Nuclear Reactors and Support Facilities: Uranium mills, commercial power reactors, fuel reprocessing plants, and uranium enrichment facilities.

Nuclear Winter: Prediction by some scientists that smoke and debris rising from massive fires of a nuclear war could block sunlight for weeks or months, cooling the earth's surface and producing climate changes that could, for example, negatively effect world agricultural and weather patterns.

Nuclide: An atom characterized by the number of protons, neturons, and energy in the nucleus.

Nutrient: Any substance assimilated by living things that promotes growth. The term is generally applied to nitrogen and phosphorus in wastewater, but is also applied to other essential and trace elements.

Nutrient Pollution: Contamination of water resources by excessive inputs of nutrients. In surface waters, excess algal production is a major concern.

O

Ocean Discharge Waiver: A variance from Clean Water Act requirements for discharges into marine waters.

Odor Threshold: The minimum odor of a water sample that can just be detected after successive dilutions with odorless water. Also called threshold odor.

Offsets: A concept whereby emissions from proposed new or modified stationary sources are balanced by reductions from existing sources to stabilize total emissions. (See: bubble, emissions trading, netting.)

Off-Site Facility: A hazardous waste treatment, storage or disposal area that is located away from the generating site.

Offstream Use: Water withdrawn from surface or groundwater sources for use at another place.

Oil Desulfurization: Widely used precombustion method for reducing sulfur dioxide emissions from oil-burning power plants. The oil is treated with hydrogen, which removes some of the sulfur by forming hydrogen sulfide gas.

Oil Fingerprinting: A method that identifies sources of oil and allows spills to be traced to their source.

Oil Spill: An accidental or intentional discharge of oil which reaches bodies of water. Can be controlled by chemical dispersion, combustion, mechanical containment, and/or adsorption. Spills from tanks and pipelines can also occur away from water bodies, contaminating the soil, getting into sewer systems and threatening underground water sources.

Oligotrophic Lakes: Deep clear lakes with few nutrients, little organic matter and a high dissolved-oxygen level.

One-hit Model: A mathematical model based on the biological theory that a single "hit" of some minimum critical amount of a carcinogen at a cellular target such as DNA can start an irreversible series events leading to a tumor.

On-Scene Coordinator (OSC): The predesignated EPA, Coast Guard, or Department of Defense official who coordinates and directs Superfund removal actions or Clean Water Act oil-or hazardous-spill response actions.

On-Site Facility: A hazardous waste treatment, storage or disposal area that is located on the generating site.

Onboard Controls: Devices placed on vehicles to capture gasoline vapor during refueling and route it to the engines when the vehicle is starting so that it can be efficiently burned.

Opacity: The amount of light obscured by particulate pollution in the air; clear window glass has zero opacity, a brick wall is 100 percent opaque. Opacity is an indicator of changes in performance of particulate control systems.

Open Burning: Uncontrolled fires in an open dump.

Open Dump: An uncovered site used for disposal of waste without environmental controls. (See: dump.)

Operable Unit: Term for each of a number of separate activities undertaken as part of a Superfund site cleanup. A typical operable unit would be removal of drums and tanks from the surface of a site.

Operating Conditions: Conditions specified in a RCRA permit that dictate how an incinerator must operate as it burns different waste types. A trial burn is used to identify operating conditions needed to meet specified performance standards.

Operation And Maintenance: 1. Activities conducted after a Superfund site action is completed to ensure that the action is effective. 2. Actions taken after construction to assure that facilities constructed to treat waste water will be properly operated and maintained to achieve normative efficiency levels and prescribed effluent limitations in an optimum manner. 3. Ongoing asbestos management plan in a school or other public building, including regular inspections, various methods of maintaining asbestos in place, and removal when necessary.

Optimal Corrosion Control Treatment: An erosion control treatment that minimizes the lead and copper concentrations at users' taps while also insuring that the treatment does not cause the water system to violate any national primary drinking water regulations.

Oral Toxicity: Ability of a pesticide to cause injury when ingested.

Organic: 1. Referring to or derived from living organisms. 2. In chemistry, any compound containing carbon.

Organic Chemicals/Compounds: Animal or plant-produced substances containing mainly carbon, hydrogen, nitrogen, and oxygen.

Organic Matter: Carbonaceous waste contained in plant or animal matter and originating from domestic or industrial sources.

Organism: Any form of animal or plant life.

Organophosphates: Pesticides that contain phosphorus; short-lived, but some can be toxic when first applied.

Organotins: Chemical compounds used in anti-foulant paints to protect the hulls of boats and ships, buoys, and pilings from marine organisms such as barnacles.

Original AHERA Inspection/Original Inspection/Inspection: Examination of school buildings arranged by Local Education Agencies to identify asbestos-containing-materials, evaluate their condition, take samples of materials suspected to contain asbestos; performed by EPA-accredited inspectors

Original Generation Point: Where regulated medical or other material first becomes waste.

Osmosis: The passage of a liquid from a weak solution to a more concentrated solution across a semipermeable membrane that allows passage of the solvent (water) but not the dissolved solids.

Outfall: The place where effluent is discharged into receiving waters.

Overburden: Rock and soil cleared away before mining.

Overdraft: The pumping of water from a groundwater basin or aquifer in excess of the supply flowing into the basin; results in a depletion or "mining" of the groundwater in the basin. (See: groundwater mining)

Overfire Air: Air forced into the top of an incinerator or boiler to fan the flames.

Overflow Rate: One of the guidelines for design of the settling tanks and clarifers in a treatment plant; used by plant operators to determine if tanks and clarifiers are over-or under-used.

Overland Flow: A land application technique that cleanses waste water by allowing it to flow over a sloped surface. As the water flows over the surface, contaminants are absorbed and the water is collected at the bottom of the slope for reuse.

Oversized Regulated Medical Waste: Medical waste that is too large for plastic bags or standard containers.

Overturn: One complete cycle of top to bottom mixing of previously stratified water masses. This phenomenon may occur in spring or fall, or after storms, and results in uniformity of chemical and physical properties of water at all depths.

Oxidant: A substance containing oxygen that reacts chemically in air to produce a new substance; the primary ingredient of photochemical smog.

Oxidation: The addition of oxygen that breaks down organic waste or chemicals such as cyanides, phenols, and organic sulfur compounds in sewage by bacterial and chemical means.

Oxidation Pond: A man-made body of water in which waste is consumed by bacteria, used most frequently with other waste-treatment processes; a sewage lagoon.

Oxidation-Reduction Potential: The electric potential required to transfer electrons from one compound or element (the oxidant) to another compound (the reductant); used as a qualitative measure of the state of oxidation in water treatment systems.

Oxygenated Fuels: Gasoline which has been blended with alcohols or ethers that contain oxygen in order to reduce carbon monoxide and other emissions.

Oxygenated Solvent: An organic solvent containing oxygen as part of the molecular structure. Alcohols and ketones are oxygenated compounds often used as paint solvents.

Ozone (O_3): Found in two layers of the atmosphere, the stratosphere and the troposphere. In the *stratosphere* (the atmospheric layer 7 to 10 miles or more above the earth's surface) ozone is a natural form of oxygen that provides a protective layer shielding the earth from ultraviolet radiation. In the *troposphere* (the layer extending up 7 to 10 miles from the earth's surface), ozone is a chemical oxidant and major component of photochemical smog. It can seriously impair the respiratory system and is one of the most widespread of all the criteria pollutants for which the Clean Air Act required EPA to set standards. Ozone in the troposphere is produced through complex chemical reactions of nitrogen oxides, which are among the primary pollutants emitted by combustion sources; hydrocarbons, released into the atmosphere through the combustion, handling and processing of petroleum products; and sunlight.

Ozonation/Ozonator: Application of ozone to water for disinfection or for taste and odor control. The ozonator is the device that does this.

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Ozone Depletion: Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules.

Ozone Hole: Thinning break in the stratospheric ozone layer. Designation of amount of such depletion as an "ozone hole" is made when detected amount of depletion exceeds fifty percent. Seasonal ozone holes have been observed over both the Antarctic region and the Arctic region and part of Canada and the extreme northeastern United States.

Ozone Layer: The protective layer in the atmosphere, about 15 miles above the ground, that absorbs some of the sun's ultraviolet rays, thereby reducing the amount of potentially harmful radiation that reaches the earth's surface.

P

Packaging: The assembly of one or more containers and any other components necessary to assure minimum compliance with a program's storage and shipment packaging requirements. Also, the containers, etc., involved.

Packed Bed Scrubber: An air pollution control device in which emissions pass through alkaline water to neutralize hydrogen chloride gas.

Packed Tower: A pollution control device that forces dirty air through a tower packed with crushed rock or wood chips while liquid is sprayed over the packing material. The pollutants in the air stream either dissolve or chemically react with the liquid.

Palatable Water: Water, at a desirable temperature, that is free from objectionable tastes, odors, colors, and turbidity.

Pandemic: Widespread throughout an area, nation or the world.

Parameter: A variable, measurable property whose value is a determinant of the characteristics of a system; e.g., temperature, pressure, and density are parameters of the atmosphere.

Paraquat: A standard herbicide used to kill various types of crops, including marijuana.

Part A Permit, Part B Permit: (See: Interim Permit Status.)

Parshall Flume: Device used to measure the flow of water in an open channel.

Particle Count: Results of a microscopic examination of treated water with a special "particle counter" that classifies suspended particles by number and size.

Particulate Loading: The mass of particulates per unit volume of air or water.

Participation Rate: Portion of population participating in a recycling program.

Particulates: 1. Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions. 2. Very small solids suspended in water,; they can vary in size, shape, density and electrical charge and can be gathered together by coagulation and flocculation.

Partition Coefficient: Measure of the sorption phenomenon, whereby a pesticide is divided between the soil and water phase: also referred to as adsorption partition coefficient.

Parts Per Billion (ppb)/Parts Per Million (ppm): Units commonly used to express contamination ratios, as in establishing the maximum permissible amount of a contaminant in water, land, or air.

Pathogens: Microorganisms that can cause disease in other organisms or in humans, animals and plants (e.g., bacteria, viruses, or parasites) found in sewage, in runoff from farms or rural areas populated with domestic and wild animals, and in water used for swimming. Fish and shellfish contaminated by pathogens, or the contaminated water itself, can cause serious illness.

Peak Electricity Demand: The maximum electricity used to meet the cooling load of a building or buildings in a given area.

Peak Levels: Levels of airborne pollutant contaminants much higher than average or occurring for short periods of time in response to sudden releases.

Percent Saturatiuon: The amount of a substance that is dissolved in a solution compared to the amount that could be dissolved in it.

Perched Water: Zone of unpressurized water held above the water table by impermeable rock or sediment.

Percolating Water: Water that passes through rocks or soil under the force of gravity.

Percolation: 1. The movement of water downward and radially through suburface soil layers, usually continuing downward to ground water. Can also involve upward movement of water. 2. Slow seepage of water through a filter.

Performance Data (for incinerators): Information collected, during a trial burn, on concentrations of designated organic compounds and pollutants found in incinerator emissions. Data analysis must show that the incinerator meets performance standards under operating conditions specified in the RCRA permit. (See: trial burn; performance standards.)

Performance Standards: 1. Regulatory requirements limiting the concentrations of designated organic compounds, particulate matter, and hydrogen chloride in emissions from incinerators. 2. Operating standards established by EPA for various permitted pollution control systems, asbestos inspections, and various program operations and maintenance requirements.

Periphyton: Microscopic underwater plants and animals that are firmly attached solid surfaces such as rocks, logs, pilings, and other structures.

Permeability: The rate at which liquids pass through soil or other materials in a specified direction.

Permissible Dose: The dose of a chemical that may be received by an individual without the expectation of a sinificantly harmful result.

Permit: An authorization, license, or equivalent control document issued by EPA or an approved state agency to implement the requirements of an environmental regulation; e.g., a permit to operate a wastewater treatment plant or to operate a facility that may generate harmful emissions.

Persistence: Refers to the length of time a compound stays in the environment, once introduced. A compound may persist for less than a second or indefinitely.

Persistent Pesticides: Pesticides that do not break down chemically or

break down very slowly and remain in the environment after a growing season.

Personal Air Samples: Air samples taken with a pump directly attached to the worker with the collecting filter and cassette placed in the worker's breathing zone (required under OSHA asbestos standards and EPA worker protection rule).

Pest: An insect, rodent, nematode, fungus, weed or other form of terrestrial or aquatic plant or animal life that is injurious to health or the environment.

Pesticide: Substances or mixture thereof intended for preventing, destroying, repelling, or mitigating any pest. Also, any substance or mixture intended for use as a plant regulator, defoliant, or desiccant.

Pesticide Tolerance: The amount of pesticide residue allowed by law to remain in or on a harvested crop. EPA sets these levels well below the point where the compounds might be harmful to consumers.

Petroleum Derivatives: Chemicals formed when gasoline breaks down in contact with ground water.

pH: An expression of the intensity of the basic or acid condition of a liquid; may range from 0 to 14, where 0 is the most acid and 7 is neutral. Natural waters usually have a pH between 6.5 and 8.5.

Pharmakinetics: The dynamic behavior of chemicals inside biological systems, including uptake, distribution, metabolism, and excretion.

Phenolphthalein Alkalinity: The alkalinity in a water sample measured by the amount of standard acid needed to lower thge pH to a level of 8.3 as indicated by the change of color of the phenolphthalein from pink to clear.

Phenols: Organic compounds that are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations cause taste and odor problems in water; higher concentrations can kill aquatic life and humans.

Phosphates: Certain chemical compounds containing phosphorus.

Phosphogypsum Piles (stacks): Principal byproduct generated in production of phosphoric acid from phosphate rock. These piles may generate radioactive radon gas.

Phosphorous Plants: Facilities using electric furnaces to produce elemental phosphorous for commercial use, such as high grade phosphoric acid, phosphate-based detergent, and organic chemicals use.

Phosphorus: An essential chemical food element that can contribute to the eutrophication of lakes and other water bodies. Increased phosphorus levels result from discharge of phosphorus-containing materials into surface waters.

Photochemical Oxidants: Air poilutants formed by the action of sunlight on oxides of nitrogen and hydrocarbons.

Photochemical Smog: Air pollution caused by chemical reactions of various pollutants emitted from different sources.

Photosynthesis: The manufacture by plants of carbohydrates and oxygen from carbon dioxide mediated by chlorophyll in the presence if sunlight.

Physical and Chemical Treatment: Processes generally used in large-scale wastewater treatment facilities. Physical processes may include air-stripping or filtration. Chemical treatment includes coagulation, chlorination, or ozonation. The term can also refer to treatment of toxic materials in surface and ground waters, oil spills, and some methods of dealing with hazardous materials on or in the ground.

Phytoplankton: That portion of the plankton community comprised of tiny plants, e.g., algae, diatoms.

Phytotoxic: Harmful to plants.

Picocuries Per Liter pCi/L): A unit of measure for levels of radon gas.

Pilot Tests: Testing a cleanup technology under actual site conditions to identify potential problems prior to full-scale implementation.

Plankton: Tiny plants and animals that live in water.

Plasma-arc Reactor: An incinerator that operates at extremely high temperatures; treats highly toxic wastes that do not burn easily.

Plasmid: A circular piece of DNA that exists apart from the chromosome and replicates independently of it. Bacterial plasmids carry information that renders the bacteria resistant to antibiotics. Plasmids are often used in genetic engineering to carry desired genes into organisms.

Plastics: Non-metallic chemoreactive compounds molded into rigid or pliable construction materials, fabrics, etc.

Plate Tower Scrubber: An air poilution control device that neutralizes hydrogen chloride gas by bubbling alkaline water through holes in a series of metal plates.

Plug Flow: Type of flow that occurs in tanks, basins, or reactors when a slug of water moves through without ever dispersing or mixing with the rest of the water flowing through.

Plugging: Act or process of stopping the flow of water, oil, or gas into or out of a formation through a borehole or well penetrating that formation.

Plume: 1. A visible or measurable discharge of a contaminant from a given point of origin. Can be visible or thermal in water, or visible in the air as, for example, a plume of smoke. 2 The area of radiation leaking from a damaged reactor. 3. Area downwind within which a release could be dangerous for those exposed to leaking fumes.

Plutonium: A radioactive metallic element chemically similar to uranium.

PM-10: A standard for measuring the amount of solid or liquid matter suspended in the atmosphere, i.e. the amount of particulate matter over 10 micrometers in diameter; smaller PM-10 particles penetrate to the deeper portions of the lung, affecting sensitive population groups such as children and individuals with respiratory ailments.

Point of Disinfectant Application: The point where disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.

Point-of-Entry Treatment Device: A treatment device applied to the drinking water entering a house or building to reduce the contaminants in the water distributed throughout the house or building.

Point-of Use Treatment Device: Treatment device applied to a single tap to reduce contaminants in the drinking water at the one faucet.

Point Source: A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution, e.g., a pipe, ditch, ship, ore pit, factory smokestack.

Pollen: The fertilizing element of flowering plants; background air pollutant.

Pollutant: Generally, any substance introduced into the environment that adversely affects the usefulness of a resource.

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Pollution Prevention: The active process of identifying areas, processes, and activities which create excessive waste byproducts or pollutants for the purpose of substitution, alteration, or elimination of the process to prevent waste and pollutant generation.

Pollutant Standard Index (PSI): Measure of adverse health effects of air pollution levels in major cities.

Pollution: Generally, the presence of matter or energy whose nature, location, or quantity produces undesired environmental effects. Under the Clean Water Act, for example, the term is defined as the manmade or man-induced alteration of the physical, biological, chemical, and radiological integrity of water.

Polonium: A radioactive element that occurs in pitchblende and other uranium-containing ores.

Polyelectrolytes: Synthetic chemicals that help solids to clump during sewage treatment.

Polymer: Basic molecular ingredients in plastic.

Polyvinyl Chloride (PVC): A tough, environmentally indestructible plastic that releases hydrochloric acid when burned.

Population: A group of interbreeding organisms occupying a particular space; the number of humans or other living creatures in a designated area.

Population at Risk: A population subgroup that is more likely to be exposed to a pollutant, or is more sensitive to the pollutant, than is the general population.

Porosity: Degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

Postchlorination: Addition of chlorine to plant effluent for disinfectant purposes after the effluent has been treated.

Post-Closure: Time period following the shutdown of a waste management or manufacturing facility; for monitoring purposes, often considered to be 30 years.

Post-Consumer Recycling: Reuse of materials generated from residential and consumer waste, e.g. converting wastepaper from offices into corrugated boxes or newsprint.

Potable Water: Water that is safe for drinking and cooking.

Potentially Responsible Party (PRP): Any individual or company-including owners, operators, transporters or generators-potentially responsible for, or contributing to a spill or other contamination at a Superfund site. Whenever possible, through administrative and legal actions, GPA requires PRPs to clean up hazardous sites they have contaminated.

Potentiation: The ability of one chemical to increase the effect of another chemical.

Prechlorination: The addition of chlorine at the headworks of a treatment plant prior to other treatment processes. Done mainly for disinfection and control of tastes, odors, and aquatic growths, and to aid in coagulation and settling,

Precipitate: A solid that separates from a solution.

Precipitation: Removal of hazardous solids from liquid waste to permit safe disposal; removal of particles from airborne emissions.

Precipitator: Pollution control device that collects particles from an air stream.

Precursor: In photochemistry, a compound antecedent to a volatile organic compound (VOC). Precursors react in sunlight to form ozone or other photochemical oxidants.

Preliminary Assessment: The process of collecting and reviewing available information about a known or suspected waste site or release.

Prescriptive: Water rights which are acquired by diverting water and putting it to use in accordance with specified procedures, e.g., filing a request with a state agency to use unused water in a stream, river, or lake.

Pressure Sewers: A system of pipes in which water, wastewater, or other liquid is pumped to a higher elevation.

Pretreatment: Processes used to reduce, eliminate, or alter the nature of wastewater pollutants from non-domestic sources before they are discharged into publicly owned treatment works (POTWs).

Prevalent Level Samples: Air samples taken under normal conditions (also known as ambient background samples).

Prevalent Levels: Levels of airborne contaminant occurring under normal conditions.

Prevention of Significant Deterioration (PSD): EPA program in which state and/or federal permits are required in order to restrict emissions from new or modified sources in places where air quality already meets or exceeds primary and secondary ambient air quality standards.

Primacy: Having the primary responsibility for administering and enforcing regulations.

Primary Drinking Water Regulation: Applies to public water systems and specifies a contaminant level, which, in the judgment of the EPA Administrator, will not adversely affect human health.

Primary Standards: National ambient air quality standards designed to protect human health with an adequate margin for safety. (See National Ambient Air Quality Standards, secondary stndards)

Primary Waste Treatment: First steps in wastewater treatment; screens and sedimentation tanks are used to remove most materials that float or will settle. Primary treatment removes about 30 percent of carbonaceous biochemical oxygen demand from domestic sewage.

Principal Organic Hazardous Constituents (POHCs): Hazardous compounds monitored during an incinerator's trial burn, selected for high concentration in the waste feed and difficulty of combustion.

Prior Appropriation: A doctrine of water law that allocates the rights to use water on a first-come, first-served basis.

Probability of Detection: The likelihood, expressed as a percentage, that a test method will correctly identify a leaking tank.

Process Variable: A physical or chemical quantity which is usually measured and controlled in the operation of a water treatment plant or industrial plant.

Process Verification: Verifying that process raw materials, water usage, waste treatment processes, production rate and other facts relative to quantity and quality of pollutants contained in discharges are substantially described in the permit application and the issued permit.

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Process Wastewater: Any water that comes into contact with any raw material, product, byproduct, or waste.

Process Weight: Total weight of all materials, including fuel, used in a manufacturing process; used to calculate the allowable particulate emission rate.

Product Level: The level of a product in a storage tank.

Product Water: Water that has passed through a water treatment plant and is ready to be delivered to consumers.

Products of Incomplete Combustion (PICs): Organic compounds formed by combustion. Usually generated in small amounts and sometimes toxic. PICs are heat-altered versions of the original material fed into the incinerator (e.g., charcoal is a P.C. from burning wood).

Propellant: Liquid in a self-pressurized pesticide product that expels the active ingredient from its container.

Proposed Plan: A plan for a site clean-up that is available to the public for comment.

Proteins: Complex nitrogenous organic compounds of high molecular weight made of amino acids; essential for growth and repair of animal tissue. Many, but not all, proteins are enzymes.

Protocol: A series of formal steps for conducting a test.

Protoplast: A membrane-bound cell from which the outer wall has been partially or completely removed. The term often is applied to plant cells.

Protozoa: One-celled animals that are larger and more complex than bacteria. May cause disease.

Public Comment Period: The time allowed for the public to express its views and concerns regarding an action by EPA (e.g., a *Federal Register* Notice of proposed rule-making, a public notice of a draft permit, or a Notice of Intent to Deny).

Public Hearing: A formal meeting at which EPA officials hear the public's views and concerns about an EPA action or proposal. EPA is required to consider such comments when evaluating its actions. Public hearings must be held upon request during the public comment period.

Public Notice: 1. Notification by EPA informing the public of Agency actions such as the issuance of a draft permit or scheduling of a hearing. EPA is required to ensure proper public notice, including publication in newspapers and broadcast media. 2. In the safe drinking water program, water suppliers are required to publish and broadcast notices when pollution problems are discovered.

Public Water System: A system that provides piped water for human consumption to at least 15 service connections or regularly serves 25 individuals.

Publicly Owned Treatment Works: A waste-treatment works owned by a state, unit of local government, or Indian tribe, usually designed to treat domestic wastewaters.

Pumping Station: Mechanical devices installed in sewer or water systems or other liquid-carrying pipelines to move the liquids to a higher level.

Putrefaction: Biological decomposition of organic matter; associated with anaerobic conditions.

Putrescible: Able to rot quickly enough to cause odors and attract flies.

Pyrolysis: Decomposition of a chemical by extreme heat.

Q

Quality Assurance/Quality Control: A system of procedures, checks, audits, and corrective actions to ensure that all EPA research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

Quench Tank: A water-filled tank used to cool incinerator residues or hot materials during industrial processes.

R

Radiation: Transmission of energy though space or any medium. Also known as radiant energy.

Radiation Standards: Regulations that set maximum exposure limits for protection of the public from radioactive materials.

Radio Frequency Radiation: (See Non-ionizing Radiation.)

Radioactive Decay: Spontaneous change in an atom by emission of charged particles and/or gamma rays; also known as radioactive disintegration and radioactivity.

Radioactive Substances: Substances that emit ionizing radiation.

Radioisotopes: Chemical variants of an element with potentially oncogenic, teratogenic, and mutagenic effects on the human body.

Radionuclide: Radioactive particle, man-made or natural, with a distinct atomic weight number. Can have a long life as soil or water pollutants.

Radius of Vulnerability Zone: The maximum distance from the point of release of a hazardous substance in which the airborne concentration could reach the level of concern under specified weather conditions.

Radon: A colorless naturally occurring, radioactive, inert gas formed by radioactive decay of radium atoms in soil or rocks.

Radon Daughters/Radon Progeny: Short-lived radioactive decay products of radon that decay into longer-lived lead isotopes that can attach themselves to airborne dust and other particles and, if inhaled, damage the linings of the lungs.

Radon Decay Products: A term used to refer collectively to the immediate products of the radon decay chain. These include Po-218, Pb-214, Bi-214, and Po-214, which have an average combined half-life of about 30 minutes.

Rasp: A machine that grinds waste into a manageable material and helps prevent odor.

Raw Sewage: Untreated wastewater and its contents.

Raw Water: Intake water prior to any treatment or use.

Reaeration: Introduction of air into the lower layers of a reservoir. As the air bubbles form and rise through the water, the oxygen dissolves into the water and replenishes the dissolved oxygen. The rising bubbles also cause the lower waters to rise to the surface where they take on oxygen from the atmosphere.

Reasonable Further Progress: Annual incremental reductions in air pollutant emissions as reflected in a State Implementation Plan that EPA deems sufficient to provide for the attainment of the applicable national ambient air quality standards by the statutory deadline.

Reasonable Maximum Exposure: The maximum exposure reasonably expected to occur in a population.

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Reasonably Available Control Measures (RACM): A broadly defined term referring to technological and other measures for pollution control.

Reasonably Available Control Technology (RACT): Control technology that is reasonably available and both technologically and economically feasible. Usually applied to existing sources in nonattainment areas; in most cases is less stringent than new source performance standards.

Recarbonization: Process in which carbon dioxide is bubbled into water being treated to lower the pH.

Receiving Waters: A river, lake, ocean, stream, or other watercourse into which wastewater or treated effluent is discharged.

Recharge: The process by which water is added to a zone of saturation, usually by percolation from the soil surface, e.g., the recharge of an aquifer.

Recharge Area: A land area in which water reaches the zone of saturation from surface infiltration, e.g., where rainwater soaks through the earth to reach an aquifer.

Recharge Rate: The quantity of water per unit of time that replenishes or refills an aquifer.

Reclamation: (In recycling) Restoration of materials found in the waste stream to a beneficial use which may be for purposes other than the original use.

Recombinant Bacteria: A microorganism whose genetic makeup has been altered by deliberate introduction of new genetic elements. The offspring of these altered bacteria also contain these new genetic elements, i.e. they "breed true."

Recombinant DNA: The new DNA that is formed by combining pieces of DNA from different organisms or cells.

Recommended Maximum Contaminant Level (RMCL): The maximum level of a contaminant in drinking water at which no known or anticipated adverse affect on human health would occur, and that includes an adequate margin of safety. Recommended levels are nonenforceable health goals. (See: maximum contaminant level.)

Reconstructed Source: Facility in which components are replaced to such an extent that the fixed capital cost of the new components exceed 50 percent of the capital cost of constructing a comparable brand-new facility. New-source performance standards may be applied to sources reconstructed after the proposal of the standard if it is technologically and economically feasible to meet the standard.

Record of Decision (ROD): A public document that explains which cleanup alternative(s) will be used at National Priorities List sites where, under CERCLA, Trust Funds pay for the cleanup.

Recovery Rate: Percentage of usable recycled materials that have been removed from the total amount of municipal solid waste generated in a specific area or by a specific business.

Recycle/Reuse: Minimizing waste generation by recovering and reprocessing usable products that might otherwise become waste (i.e. recycling of aluminum cans, paper, and bottles, etc.).

Red Bag Waste: (See: infectious waste.)

Red Border: An EPA document undergoing review before being submitted for final management decision-making.

Red Tide: A proliferation of a marine plankton toxic often fatal to fish, perhaps stimulated by the addition of nutrients. A tide can be red, green, or brown, depending on the coloration of the plankton.

Reduction: The addition of hydrogen, removal of oxygen, or addition of electrons to an element or compound.

Reentry Interval: The period of time immediately following the application of a pesticide during which unprotected workers should not enter a field.

Reference Dose (RfD): The concentration of a chemical known to cause health problems; also referred to as the ADI, or acceptable daily intake.

Reformulated Gasoline: Gasoline with a different composition from conventional gasoline (e.g., lower aromatics content) that cuts air pollutants.

Refueling Emissions: Emissions released during vehicle refueling.

Refuse Reclamation: Conversion of solid waste into useful products, e.g., composting organic wastes to make soil conditioners or separating aluminum and other metals for recycling.

Refuse: (See: solid waste.)

Regeneration: Manipulation of cells to cause them to develop into whole plants.

Regional Response Team (RRT): Representatives of federal, local, and state agencies who may assist in coordination of activities at the request of the On-Scene Coordinator before and during a significant pollution incident such as an oil spill, major chemical release, or a Superfund response.

Registrant: Any manufacturer or formulator who obtains registration for a pesticide active ingredient or product.

Registration: Formal listing with EPA of a new pesticide before it can be sold or distributed. Under the Federal Insecticide, Fungicide, and Rodenticide Act, EPA is responsible for registration (pre-market licensing) of pesticides on the basis of data demonstrating no unreasonable adverse effects on human health or the environment when applied according to approved label directions.

Registration Standards: Published documents which include summary reviews of the data available on a pesticide's active ingredient, data gaps, and the Agency's existing regulatory position on the pesticide.

Regulated Asbestos-Containing Material (RACM): Friable asbestos material or nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or has crumbled, or been pulverized or reduced to powder in the course of demolition or renovation operations.

Regulated Medical Waste: Under the Medical Waste Tracking Act of 1988, any solid waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals. Included are cultures and stocks of infectious agents; human blood and blood products; human pathological body wastes from surgery and autopsy; contaminated animal carcasses from medical research; waste from patients with communicable diseases; and all used sharp implements, such as needles and scalpels, etc., and certain unused sharps. (See; treated medical waste; untreated medical waste; destroyed medical waste.)

Release: Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of a hazardous or toxic chemical or extremely hazardous substance.

Remedial Action (RA): The actual construction or implementation phase of a Superfund site cleanup that follows remedial design.

Remedial Design: A phase of remedial action that follows the remedial investigation/feasibility study and includes development of engineering drawings and specifications for a site cleanup.

Remedial Investigation: An in-depth study designed to gather data needed to determine the nature and extent of contamination at a Superfund site, establish site cleanup criteria, identify preliminary alternatives for remedial action, and support technical and cost analyses of alternatives. The remedial investigation is usually done with the feasibility study. Together they are usually referred to as the "RI/FS".

Remedial Project Manager (RPM): The EPA or state official responsible for overseeing on-site remedial action.

Remedial Response: Long-term action that stops or substantially reduces a release or threat of a release of hazardous substances that is serious but not an immediate threat to public health.

Remediation: 1. Cleanup or other methods used to remove or contain a toxic spill or hazardous materials from a Superfund site; 2. for the Asbestos Hazard Emergency Response program, abatement methods including evaluation, repair, enclosure, encapsulation, or removal of greater than 3 linear feet or square feet of asbestos-containing materials from a building.

Remote Sensing: The collection and interpretation of information about an object without physical contact with the object; e.g., satellite imaging and aerial photograph.

Removal Action: Short-term immediate actions taken to address releases of hazardous substances that require expedited response. (See: cleanup.)

Repeat Compliance Period: Any subsequent compliance period after the initial one.

Reportable Quantity (RQ): Quantity of a hazardous substance that triggers reports under CERCLA. If a substance exceeds its RQ, the release must be reported to the National Response Center, the SERC, and community emergency coordinators for areas likely to be affected.

Repowering: Rebuilding and replacing major components of a power plant instead of building a new one.

Representative Sample: A portion of material or water that is as nearly identifical in content and consistency as possible to that in the larger body of material or water being sampled.

Reregistration: The reevaluation and relicensing of existing pesticides originally registered prior to current scientific and regulatory standards. EPA reregisters pesticides through its Registration Standards Program.

Reserve Capacity: Extra treatment capacity built into solid waste and wastewater treatment plants and interceptor sewers to accommodate flow increases due to future population growth.

Reservoir: Any natural or artificial holding area used to store, regulate, or control water.

Residual: Amount of a pollutant remaining in the environment after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment, or particulates remaining in air after it passes through a scrubbing or other process.

Residual Risk: The extent of health risk from air pollutants remaining after application of the Maximum Achievable Control Technology (MACT).

Residue: The dry solids remaining after the evaporation of a sample of water or sludge.

Resistance: For plants and animals, the ability to withstand poor environmental conditions or attacks by chemicals or disease. May be inborn or acquired.

Resource Recovery: The process of obtaining matter or energy from materials formerly discarded.

Response Action: 1. Generic term for actions taken in response to actual or potential health-threatening environmental events such as spills, sudden releases, and asbestos abatement/management problems; 2. A CERCLA-authorized action involving either a short-term removal action or a long-term removal response. This may include but is not limited to: removing hazardous materials from a site to an EPA-approved hazardous waste facility for treatment, containment or treating the waste on-site, identifying and removing the sources of ground-water contamination and halting further migration of contaminants; 3. Any of the following actions taken in school buildings in response to AHERA to reduce the risk of exposure to asbestos: removal, encapsulation, enclosure, repair, and operations and maintenance. (See: cleanup)

Responsiveness Summary: A summary of oral and/or written public comments received by EPA during a comment period on key EPA documents, and EPA's response to those comments.

Restoration: Measures taken to return a site to pre-violation conditions.

Restricted Use: A pesticide may be classified (under FIFRA regulations) for restricted use if the it requires special handling because of its toxicity, and, if so, it may be applied only by trained, certified applicators or those under their direct supervision.

Restriction Enzymes: Enzymes that recognize specific regions of a long DNA molecule and cut it at those points.

Retrofit: Addition of a pollution control device on an existing facility without making major changes to the generating plant.

Reuse: Using a product or component of municipal solid waste in its original form more than once, e.g., refilling a glass bottle that has been returned or using a coffee can to hold nuts and bolts.

Reverse Osmosis: A treatment process used in water systems by adding pressure to force water through a semipermeable membrane. Reverse osmosis removes most drinking water contaminants. Also used in wastewater treatment. Large-scale reverse osmosis plants are being developed.

Reversible Effect: An effect which is not permanent; especially adverse effects which diminish when exposure to a toxic chemical stops.

Ribonucleic Acid (RNA): A molecule that carries the genetic message from DNA to a cellular protein-producing mechanisms.

Rill: A small channel eroded into the soil by surface runoff; can be easily smoothed out or oblitrated by normal tillage.

Ringlemann Chart: A series of shaded illustrations used to measure the opacity of air pollution emissions, ranging from light grey through black; used to set and enforce emissions standards.

Riparian Habitat: Areas adjacent to rivers and streams with a high density, diversity, and productivity of plant and animal species relative to nearby uplands.

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Riparian Rights: Entitlement of a land owner to certain uses of water on or bordering his property, including the right to prevent diversion or misuse of upstream waters. Generally a matter of state law.

Risk: A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard.

Risk Assessment: Qualitative and quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence and/or use of specific pollutants.

Risk-based Targeting: The direction of resources to those areas that have been identified as having the highest potential or actual adverse effect on human health and/or the environment.

Risk Characterization: The last step in the risk assessment process; characterizes the potenetial for adverse health effects and evaluates the degree of uncertainty invoived.

Risk Communication: The exchange of information about health or environmental risks among risk assessors and managers, the general public, news media, interest groups, etc.

Risk Estimate: A description of the probability that organisms exposed to a specific dose of a chemical or other pollutant will develop an adverse response, e.g., cancer.

Risk Factor: Characteristics (e.g., race, sex, age, obesity) or variables (e.g., smoking, occupational exposure level) associated with increased probability of a toxic effect.

Risk Management: The process of evaluating and selecting alternative regulatory and non-regulatory responses to risk. The selection process necessarily requires the consideration of legal, economic, and behavioral factors.

Risk-Specific Dose: The dose associated with a specified risk level.

River Basin: The land area drained by a river and its tributaries.

Rodenticide: A chemical or agent used to destroy rats or other rodent pests, or to prevent them from damaging food, crops, etc.

Rotary Kiln Incinerator: An incinerator with a rotating combustion chamber that keeps waste moving, thereby allowing it to vaporize for easier burning.

Rough Fish: Fish not prized for eating, such as gar and suckers. Most are more tolerant of changing environmental conditions than game species.

Route of Exposure: The avenue by which a chemical comes into contact with an organism, e.g., inhalation, ingestion, dermal contact, injection.

Rubbish: Solid waste, excluding food waste and ashes, from homes, institutions, and work-places.

Run-Off: That part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface-water. It can carry pollutants from the air and land into receiving waters.

Running Losses: Evaporation of motor vehicle fuels from the fuel tank while the vehicle is in use.

S

Sacrifical Anode: An easily corroded material deliberately installed in a pipe or intake to give it up to corrosion while the rest of the water supply facility remains relatively corrosion-free.

Safe: Condition of exposure under which there is a practical certrainty that no harm will result to exposed indiviuals.

Safener: A chemical added to a pesticide to keep it from injuring plants.

Safe Water: Water that does not contain harmful bacteria, toxic materials, or chemicals, and is considered safe for drinking even if it may have taste, odor, color, and certain mineral problems.

Safe Yield: The annual amount of water that can be taken from a source or supply over a period of years without depleting that source beyond its ability to be replenished naturally in "wet years."

Salinity: The percentage of salt in water.

Salt Water Intrusion: The invasion of fresh surface or ground water by salt water. If it comes from the ocean it may be called sea water intrusion.

Salts: Minerals that water picks up as it passes through the air, over and under the ground, or from households and industry.

Salvage: The utilization of waste materials.

Sanctions: Actions taken by the federal government for failure to plan or implement a State Improvement Plan (SIP). Such action may be include withholding of highway funds and a ban on construction of new sources of potential pollution.

Sand Filters: Devices that remove some suspended solids from sewage. Air and bacteria decompose additional wastes filtering through the sand so that cleaner water drains from the bed.

Sanitary Landfill: (See: landfills.)

Sanitary Sewers: Underground pipes that carry off only domestic or industrial waste, not storm water.

Sanitary Survey: An on-site review of the water sources, facilities, equipment, operation and maintenance of a public water system to evaluate the adequacy of those elements for producing and distributing safe drinking water.

Sanitary Water (Also known as gray water): Water discharged from sinks, showers, kitchens, or other nonindustrial operations, but not from commodes.

Sanitation: Control of physical factors in the human environment that could harm development, health, or survival.

Saprophytes: Organisms living on dead or decaying organic matter that help natural decomposition of organic matter in water.

Saturated Zone: The area below the water table where all open spaces are filled with water under pressure equal to or greater than that of the atmosphere.

Saturation: The condition of a liquid when it has taken into solution the maximum possible quantity of a given substance at a given temperature and pressure.

Scrap: Materials discarded from manufacturing operations that may be suitable for reprocessing.

Screening: Use of screens to remove coarse floating and suspended solids from sewage.

Science Advisory Board (SAB): A group of external scientists who advise EPA on science and policy.

Scrubber: An air pollution device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.

Secondary Drinking Water Regulations: Non-enforceable regulations applying to public water systems and specifying the maximum contamination levels that, in the judgment of EPA, are required to protect the public welfare. These regulations apply to any contaminants that may adversely affect the odor or appearance of such water and consequently may cause people served by the system to discontinue its use.

Secondary Materials: Materials that have been manufactured and used at least once and are to be used again.

Secondary Standards: National ambient air quality standards designed to protect *welfare*, including effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate; damage to property; transportation hazards; effects on economic values, and on personal comfort and well-being.

Secondary Treatment: The second step in most publicly owned waste treatment systems in which bacteria consume the organic parts of the waste. It is accomplished by bringing together waste, bacteria, and oxygen in trickling filters or in the activated sludge process. This treatment removes floating and settleable solids and about 90 percent of the oxygen-demanding substances and suspended solids. Disinfection is the final stage of secondary treatment. (See: primary, tertiary treatment.)

Secure Chemical Landfill: (See: landfills.)

Secure Maximum Contaminant Level: Maximum permissible level of a contaminant in water delivered to the free flowing outlet of the ultimate user, or of contamination resulting from corrosion of piping and plumbing caused by water quality.

Sediment Yield: The quantity of sediment arriving at a specific location.

Sedimentation Tanks: Wastewater tanks in which floating wastes are skimmed off and settled solids are removed for disposal.

Sedimentation: Letting solids settle out of wastewater by gravity during treatment.

Sediments: Soil, sand, and minerals washed from land into water, usually after rain. They pile up in reservoirs, rivers and harbors, destroying fish and wildlife habitat, and clouding the water so that sunlight cannot reach aquatic plants. Careless farming, mining, and building activities will expose sediment materials, allowing them to wash off the land after rainfall.

Seed Protectant: A chemical applied before planting to protect seeds and seedlings from disease or insects.

Seepage: Percolation of water through the soil from unlined canals, ditches, laterals, watercourses, or water storage facilities.

Selective Pesticide: A chemical designed to affect only certain types of pests, leaving other plants and animals unharmed.

Semi-Confined Aquifer: An aquifer partially confined by soil layers of low permeability through which recharge and discharge can still occur.

Senescence: The aging process. Sometimes used to describe lakes or other bodies of water in advanced stages of *eutrophication*.

Septic System: An on-site system designed to treat and dispose of domestic sewage. A typical septic system consists of a tank that receives waste from a residence or business amd a system of tile lines or a pit for disposal of the liquid effluent (sludge) that remains after decomposition of the solidis by bacteria in the tank; must be pumped out periodically.

Septic Tank: An underground storage tank for wastes from homes not connected to a sewer line. Waste goes directly from the home to the tank. (See: septic system.)

Service Connector: The pipe that carries tap water from a public water main to a building.

Service Line Sample: A one-liter sample of water collected according to federal regulations that has been standing for at least 6 hours in a service pipeline.

Service Pipe: The pipeline extending from the water main to the building served or to the consumer's system.

Settleable Solids: Material heavy enough to sink to the bottom of a wastewater treatment tank.

Settling Chamber: A series of screens placed in the way of flue gases to slow the stream of air, thus helping gravity to pull particles into a collection device.

Settling Tank: A holding area for wastewater, where heavier particles sink to the bottom for removal and disposal.

7Q10: Seven-day, consecutive low flow with a ten year return frequency; the lowest stream flow for seven consecutive days that would be expected to occur once in ten years.

Sewage: The waste and wastewater produced by residential and commercial [illegible]rces and discharged into sewers.

Sewage Lagoon: (See: lagoon.)

Sewage Sludge: Sludge produced at a Publicly Owned Treatment Works, the disposal of which is regulated under the Clean Water Act.

Sewer: A channel or conduit that carries wastewater and storm-water runoff from the source to a treatment plant or receiving stream. "Sanitary" sewers carry household, industrial, and commercial waste. "Storm" sewers carry runoff from rain or snow. "Combined" sewers handle both.

Sewerage: The entire system of sewage collection, treatment, and disposal.

Sharps: Hypodermic needles, syringes (with or without the attached needle) pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes used in animal or human patient care or treatment, or in medical, research or industrial laboratories. Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips, and unused hypodermic and suture needles, syringes, and scalpel blades.

Shock Load: The arrival at a water treatment plant of raw water containing unusual amounts of algae, colloidal matter, color, suspended solids, turbidity, or other pollutants.

Short-Circuiting: When some of the water in tanks or basins flows faster than the rest; may result in shorter contact, reaction, or settling times than calculated or presumed.

Signal: The volume or product-level change produced by a leak in a tank.

Signal Words: The words used on a pesticide label—Danger, Warning, Caution—to indicate level of toxicity.

Significant Deterioration: Pollution resulting from a new source in previously "clean" areas. (See: prevention of significant deterioration.)

Significant Municipal Facilities: Those publicly owned sewage treatment plants that discharge a million gallons per day or more and are therefore considered by states to have the poten-

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tial to substantially effect the quality of receiving waters.

Significant Non-Compliance: (See: significant violations.)

Significant Violations: Violations by point source dischargers of sufficient magnitude or duration to be a regulatory priority.

Silt: Sedimentary materials composed of fine or intermediate-sized mineral particles.

Silviculture: Management of forest land for timber.

Sink: Place in the environment where a compound or material collects.

Sinking: Controlling oil spills by using an agent to trap the oil and sink it to the bottom of the body of water where the agent and the oil are biodegraded.

Site: An area or place within the jurisdiction of the EPA and/or a state.

Site Assessment Program: A means of evaluating hazardous waste sites through preliminary assessments and site inspections to develop a Hazard Ranking System score.

Site Inspection: The collection of information from a Superfund site to determine the extent and severity of hazards posed by the site. It follows and is more extensive than a preliminary assessment. The purpose is to gather information necessary to score the site, using the Hazard Ranking System, and to determine if it presents an immediate threat requiring prompt removal.

Site Safety Plan: A crucial element in all removal actions, it includes information on equipment being used, precautions to be taken, and steps to take in the event of an on-site emergency.

Siting: The process of choosing a location for a facility.

Skimming: Using a machine to remove oil or scum from the surface of the water.

Slow Sand Filtration: Passage of raw water through a bed of sand at low velocity, resulting in substantial removal of chemical and biological contaminants.

Sludge: A semi-solid residue from any of a number of air or water treatment processes; can be a hazardous waste.

Sludge Digester: Tank in which complex organic substances like sewage sludges are biologically dredged. During these reactions, energy is released and much of the sewage is converted to methane, carbon dioxide, and water.

Slurry: A watery mixture of insoluble matter resulting from some pollution control techniques.

Small Quantity Generator (SQG-sometimes referred to as "Squeegee"): Persons or enterprises that produce 220-2200 pounds per month of hazardous waste; are required to keep more records than conditionally exempt generators. The largest category of hazardous waste generators, SQGs include automotive shops, dry cleaners, photographic developers, and a host of other small businesses. (See: conditionally exempt generators).

Smelter: A facility that melts or fuses ore, often with an accompanying chemical change, to separate its metal content. Emissions cause pollution. "Smelting" is the process involved.

Smog: Air pollution associated with oxidants. (See: photochemical smog.)

Smoke: Particles suspended in air after incomplete combustion.

Soft Detergents: Cleaning agents that break down in nature.

Soft Water: Any water that does not contain a significant amount of dissolved minerals such as salts of calcium or magnesium.

Soil Adsorption Field: A sub-surface area containing a trench or bed with clean stones and a system of piping through which treated sewage may seep into the surrounding soil for further treatment and disposal.

Soil and Water Conservation Practices: Control measures consisting of managerial, vegetative, and structural practices to reduce the loss of soil and water.

Soil Conditioner: An organic material like humus or compost that helps soil absorb water, build a bacterial community, and take up mineral nutrients.

Soil Erodibility: An indicator of a soil's susceptibility to raindrop impact, runoff, and other erosive processes.

Soil Gas: Gaseous elements and compounds in the small spaces between particles of the earth and soil. Such gases can be moved or driven out under pressure.

Soil Sterilant: A chemical that temporarily or permanently prevents the growth of all plants and animals.

Solder: Metallic compound used to seal joints between pipes. Until recently, most solder contained 50 percent lead. Use of lead solder containing more than 0.2 percent lead in pipes carrying drinking water is now prohibited.

Sole-Source Aquifer: An aquifer that supplies 50-percent or more of the drinking water of an area.

Solid Waste: Non-liquid, non-soluble materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes, and mining residues. Technically, solid waste also refers to liquids and gases in containers.

Solid Waste Disposal: The final placement of refuse that is not salvaged or recycled.

Solid Waste Management: Supervised handling of waste materials from their source through recovery processes to disposal.

Solidification and Stabilization: Removal of wastewater from a waste or changing it chemically to make it less permeable and susceptible to transport by water.

Soot: Carbon dust formed by incomplete combustion.

Sorption: The action of soaking up or attracting substances; process used in many pollution control systems.

Source Reduction: Reducing the amount of materials entering the waste stream by redesigning products or patterns of production or consumption (e.g., using returnable beverage containers). Synonymous with waste reduction.

Source Separation: Segregating various wastes at the point of generation (e.g., separation of paper, metal and glass from other wastes to make recycling simpler and more efficient.)

Special Review: Formerly known as Rebuttable Presumption Against Registration (RPAR), this is the regulatory process through which existing pesticides suspected of posing unreasonable risks to human health, non-target organisms, or the environment are referred for review by EPA. Such review requires an intensive risk/benefit analysis with opportunity for public comment. If risk is found to outweigh social and economic benefits, regulatory actions ranging from label revi-

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sions and use-restriction to cancellation or suspended registration can be initiated.

Special Waste: Items such as household hazardous waste, bulky wastes (refrigerators, pieces of furniture, etc.) tires, and used oil.

Species: A reproductively isolated aggregate of interbreeding organisms.

Specific Conductance: Rapid method of estimating the dissolved solid content of a water supply by testing its capacity to carry an electrical current.

Specific Yield: The amount of water a unit volume of saturated permeable rock will yield when drained by gravity.

Spill Prevention Control and Countermeasures Plan (SPCP): Plan covering the release of hazardous substances as defined in the Clean Water Act.

Spoil: Dirt or rock removed from its original location—destroying the composition of the soil in the process—as in strip-mining, dredging, or construction.

Sprawl: Unplanned development of open land.

Spray Tower Scrubber: A device that sprays alkaline water into a chamber where acid gases are present to aid in the neutralizing of the gas.

Spring: Ground water seeping out of the earth where the water table intersects the ground surface.

Spring Melt/Thaw: The process whereby warm temperatures melt winter snow and ice. Because various forms of acid deposition may have been stored in the frozen water, the melt can result in abnormally large amounts of acidity entering streams and rivers, sometimes causing fish kills.

Stable Air: A motionless mass of air that holds instead of dispersing pollutants.

Stabilization: Conversion of the active organic matter in sludge into inert, harmless material.

Stabilization Ponds: (See: lagoon.)

Stack: A chimney, smokestack, or vertical pipe that discharges used air.

Stack Effect: Air, as in a chimney, that moves upward because it is warmer than the ambient atmosphere.

Stack Gas: (See: flue gas.)

Stage II Controls: Systems placed on service station gasoline pumps to control and capture gasoline vapors during refuelling.

Stagnation: Lack of motion in a mass of air or water that holds pollutants in place.

Standard Sample: The part of finished drinking water that is examined for the presence of coliform bacteria.

Standards: Norms that impose limits on the amount of pollutants or emissions produced. EPA establishes minimum standards, but states are allowed to be stricter.

Start of a Response Action: The point in time when there is a guarantee or set-aside of funding either by EPA, other federal agencies, states or Principal Responsible Parties in order to begin response actions at a Superfund site.

State Emergency Response Commission (SERC): Commission appointed by each state governor according to the requirements of SARA Title III. The SERCs designate emergency planning districts, appoint local emergency planning committees, and supervise and coordinate their activities.

State Implementation Plans (SIP): EPA-approved state plans for the establishment, regulation, and enforcement of air pollution standards.

Static Water Depth: The vertical distance from the centerline of the pump discharge down to the surface level of the free pool while no water is being drawn from the pool or water table.

Static Water Level: 1. Elevation or level of the water table in a well when the pump is not operating. 2. The level or elevation to which water would rise in a tube connected to an artesian aquifer or basin in a conduit under pressure.

Stationary Source: A fixed-site producer of pollution, mainly power plants and other facilities using industrial combustion processes.

Sterilization: The removal or destruction of all microorganisms, including pathogenic and other bacteria, vegetative forms, and spores.

Storage: Temporary holding of waste pending treatment or disposal, as in containers, tanks, waste piles, and surface impoundments.

Storm Sewer: A system of pipes (separate from sanitary sewers) that carries only water runoff from buildings and land surfaces.

Stratification: Separating into layers.

Stratosphere: The portion of the atmosphere 10-to-25 miles above the earth's surface.

Strip-Cropping: Growing crops in a systematic arrangement of strips or bands that serve as barriers to wind and water erosion.

Strip-Mining: A process that uses machines to scrape soil or rock away from mineral deposits just under the earth's surface.

Structural Deformation: Distortion in walls of a tank after liquid has been added or removed.

Subchronic: Of intermediate duration, usually used to describe studies or periods of exposure lasting between 5 and 90 days

Submerged Aquatic Vegetation: Vegetation such as sea grasses that cannot withstand excessive drying and therefore live with their leaves at or below the water surface; an important habitat for young fish and other aquatic organisms.

Sulfur Dioxide (SO_2): A pungent, colorless, gaseous pollutant formed primarily by the combustion of fossil fuels.

Sump: A pit or tank that catches liquid runoff for drainage or disposal.

Superchlorination: Chlorination with doses that are deliberately selected to produce water free of combined residuals so large as to require dechlorination.

Supercritical Water: A type of thermal treatment using moderate temperatures and high pressures to enhance the ability of water to break down large organic molecules into smaller, less toxic ones. Oxygen injected during this process combines with simple organic compounds to form carbon dioxide and water.

Superfund: The program operated under the legislative authority of CERCLA and SARA that funds and carries out EPA solid waste emergency and long-term removal and remedial activities. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority, and conducting and/or supervising the cleanup and other remedial actions.

Superfund Innovative Technology Evaluation: EPA program to promote development and use of innovative treatment technologies in Superfund site cleanups.

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Supplier of Water: Any person who owns or operates a public water supply.

Surface Impoundment: Treatment, storage, or disposal of liquid hazardous wastes in ponds.

Surface Runoff: Precipitation, snowmelt, or irrigation water in excess of what can infiltrate the soil surface and be stored in small surface depressions; a major transporter of non-point source pollutants.

Surface Uranium Mines: Strip mining operations for removal of uranium-bearing ore.

Surface Water: All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.) and all springs, wells, or other collectors directly influenced by surface water.

Surfacing ACM: Asbestos-containing material that is sprayed or troweled on or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members.

Surfacing Material: Material sprayed or troweled onto structural members (beams, columns, or decking) for fire protection; or on ceilings or walls for fireproofing, acoustical or decorative purposes. Includes textured plaster, and other textured wall and ceiling surfaces.

Surfactant: A detergent compound that promotes lathering.

Surveillance System: A series of monitoring devices designed to check on environmental conditions.

Suspect Material: Building material suspected of containing asbestos, e.g., surfacing material, floor tile, ceiling tile, thermal system insulation, and miscellaneous other materials.

Suspended Loads: Sediment particles maintained in the water column by turbulence and carried with the flow of water.

Suspended Solids: Small particles of solid pollutants that float on the surface of, or are suspended in, sewage or other liquids. They resist removal by conventional means.

Suspension: Suspending the use of a pesticide when EPA deems it necessary to prevent an imminent hazard resulting from its continued use. An emergency suspension takes effect immediately; ordinary suspension a registrant can request a hearing before the suspension goes into effect. Such a hearing process might take six months.

Suspension Culture: Cells growing in a liquid nutrient medium.

Swamp: A type of wetland dominated by woody vegetation but without appreciable peat deposits. Swamps may be fresh or salt water and tidal or non-tidal. (See: wetlands.)

Synergism: An interaction of two or more chemicals that results in an effect greater than the sum of their separate effects.

Synthetic Organic Chemicals (SOCs): Man-made organic chemicals. Some SOCs are volatile, others tend to stay dissolved in water instead of evaporating.

System With a Single Service Connection: A system that supplies drinking water to consumers via a single service line.

Systemic Pesticide: A chemical absorbed by an organism that makes the organism toxic to pests.

T

Tailings: Residue of raw material or waste separated out during the processing of crops or mineral ores.

Tailpipe Standards: Emissions limitations applicable to mobile source engine exhausts.

Tail Water: The runoff of irrigation water from the lower end of an irrigated field.

Tampering: Adjusting, negating, or removing pollution control equipment on a motor vehicle.

Technical Assistance Grant (TAG): As part of the Superfund program, Technical Assistance Grants of up to $50,000 are provided to citizens' groups to obtain assistance in interpreting information related to cleanups at Superfund sites or those proposed for the National Priorities List. Grants are used by such groups to hire technical advisors to help them understand the site-related technical information for the duration of response activities.

Technology-Based Limitations: Industry-specific effluent limitations applied to a discharge when it will not cause a violation of water quality standards at low stream flows. Usually applied to discharges into large rivers.

Technology-Based Standards: Effluent limitations applicable to direct and indirect sources which are developed on a category-by-category basis using statutory factors, not including water-quality effects.

Teratogenesis: The introduction of non-hereditary birth defects in a developing fetus by exogenous factors such as physical or chemical agents acting in the womb to interfere with normal embryonic development.

Terracing: Dikes built along the contour of sloping farm land that hold runoff and sediment to reduce erosion.

Tertiary Treatment: Advanced cleaning of wastewater that goes beyond the secondary or biological stage, removing nutrients such as phosphorus, nitrogen, and most BOD and suspended solids.

Therapeutic Index: The ratio of the dose required to produce toxic or lethal effects to dose required to produce nonadverse or therapeutic response.

Thermal Pollution: Discharge of heated water from industrial processes; can kill or injure aquatic organisms.

Thermal Stratification: The formation of layers of different temperatures in a lake or reservoir..

Thermal System Insulation (TSI): Asbestos-containing material applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain or water condensation.

Thermal Treatment: Use of elevated temperatures to treat hazardous wastes. (See: incineration; pyrolysis.)

Thermocline: The middle layer of a thermally stratified lake or reservoir. In this layer there is a rapid decrease in temperatures in a lake or reservoir.

Threshold: The lowest dose of a chemical at which a specified measurable effect is observed and below which it is not observed.

Threshold Level: Time-weighted average pollutant concentration values, exposure beyond which is likely to adversely affect human health. (See: environmental exposure)

Threshold Limit Value (TLV): The concentration of an airborne substance that an average person can be repeatedly exposed to without adverse effects.

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TLVs may be expressed in three ways: TLV-TWA-Time weighted average, based on an allowable exposure averaged over a normal 8-hour workday or 40-hour workweek; TLV-STEL-Short-term exposure limit or maximum concentration for a brief specified period of time, depending on a specific chemical (TWA must still be met); and TLV-C-Ceiling Exposure Limit or maximum exposure concentration not to be exceeded under any circumstances. (TWA must still be met.)

Threshold Odor: (See: Odor threshold)

Threshold Planning Quantity: A quantity designated for each chemical on the list of extremely hazardous substances that triggers notification by facilities to the State Emergency Response Commission that such facilities are subject to emergency planning requirements under SARA Title III.

Tidal Marsh: Low, flat marshlands traversed by channels and tidal hollows, subject to tidal inundation; normally, the only vegetation present is salt-tolerant bushes and grasses. (See: wetlands.)

Tillage: Plowing, seedbed preparation, and cultivation practices.

Total Suspended Particles: A method of monitoring particulate matter by total weight.

Time-weighted Average (TWA): In air sampling, the average air concentration of contaminants during a given period.

Tolerances: Permissible residue levels for pesticides in raw agricultural produce and processed foods. Whenever a pesticide is registered for use on a food or a feed crop, a tolerance (or exemption from the tolerance requirement) must be established. EPA establishes the tolerance levels, which are enforced by the Food and Drug Administration and the Department of Agriculture.

Tonnage: The amount of waste that a landfill accepts, usually expressed in tons per month. The rate at which a landfill accepts waste is limited by the landfill's permit.

Topography: The physical features of a surface area including relative elevations and the position of natural and man-made features.

Total Dissolved Phosphorous: The total phosphorous content o all material that will pass through a filter, which is determined as orthophosphate without prior digestion or hydrolysis. Also called soluble reactive P.

Total Dissolved Solids (TDS): All material that passes the standard glass river filter; now called total filterable residue. Term is used to reflect salinity.

Total Suspended Solids (TSS): A measure of the suspended solids in wastewater, effluent, or water bodies, determined by tests for "total suspended non-filterable solids." (See: suspended solids.)

Toxaphene: Chemical that causes adverse health effects in domesic water supplies and is toxic to fresh water and marine aquatic life.

Toxic Chemical Release Form: Information form required of facilities that manufacture, process, or use (in quantities above a specific amount) chemicals listed under SARA Title III.

Toxic Chemical: Any chemical listed in EPA rules as "Toxic Chemicals Subject to Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986."

Toxic Chemical Use Substitution: Replacing toxic chemicals with less harmful chemicals in industrial processes.

Toxic Cloud: Airborne plume of gases, vapors, fumes, or aerosols containing toxic materials.

Toxic Pollutants: Materials that cause death, disease, or birth defects in organisms that ingest or absorb them. The quantities and exposures necessary to cause these effects can vary widely.

Toxic Release Inventory: Database of toxic releases in the United States compiled from SARA Title III section 313 reports.

Toxic Substance: A chemical or mixture that may present an unreasonable risk of injury to health or the environment.

Toxic Waste: A waste that can produce injury if inhaled, swallowed, or absorbed through the skin.

Toxicant: A harmful substance or agent that may injure an exposed organism.

Toxicity Assessment: Characterization of the toxicological properties and effects of a chemical, with special emphasis on establishment of dose-response characteristics.

Toxicity Testing: Biological testing (usually with an invertebrate, fish, or small mammal) to determine the adverse effects of a compound or effluent.

Toxicological Profile: An examination, summary, and interpretation of a hazardous substance to determine levels of exposure and associated health effects.

Transboundary Pollutants: Air pollution that travels from one jurisdiction to another, often crossing state or international boundaries. Also applies to water pollution.

Transient Water System: A non-community water system that does not serve 25 of the same nonresidents per day for more than six months per year.

Transmission Lines: Pipelines that transport raw water from its source to a water treatment plant, then to the distribution grid system.

Transmissivity: The ability of an aquifer to transmit water.

Transpiration: The process by which water vapor is lost to the atmosphere from living plants. The term can also be applied to the quantity of water thus dissipated.

Transportation Control Measures (TCMs): Steps taken by a locality to adjust traffic patterns (e.g., bus lanes, turnout, right turn on red) or reduce vehicle use (ride sharing, high-occupancy vehicle lanes) to cut vehicular emissions.

Trash: Material considered worthless or offensive that is thrown away. Generally defined as dry waste material, but in common usage it is a synonym for garbage, rubbish, or refuse.

Trash-to-Energy Plan: Burning trash to produce energy.

Treatability Studies: Tests of potential cleanup technologies conducted in a laboratory (See: bench-scale tests.)

Treated Regulated Medical Waste: Medical waste treated to substantially reduce or eliminate its pathogenicity, but that has not yet been destroyed.

Treated Wastewater: Waste-water that has been subjected to one or more physical, chemical, and biological processes to reduce its pollution or health hazards.

Treatment: (1) Any method, technique, or process designed to remove solids and/or pollutants from solid waste, wastestreams, effluents, and air emissions. (2) methods used to change the biological character or composition of any regulated medical waste so as to substantially reduce or eliminate its potential for causing disease.

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Treatment Plant: A structure built to treat wastewater before discharging it into the environment.

Treatment, Storage, and Disposal Facility: Site where a hazardous substance is treated, stored, or disposed of. TSD facilities are regulated by EPA and states under RCRA.

Tremie: Device used to place concrete or grout under water.

Trial Burn: An incinerator test in which emissions are monitored for the presence of specific organic compounds, particulates, and hydrogen chloride.

Trichloroethylene (TCE): A stable, low boiling-point colorless liquid, toxic if inhaled. Used as a solvent or metal degreasing agent, and in other industrial applications.

Trickling Filter: A coarse treatment system in which wastewater is trickled over a bed of stones or other material covered with bacteria that break down the organic waste and produce clean water.

Trickle Irrigation: Method in which water drips to the soil from perforated tubes or emitters.

Trihalomethane (THM): One of a family of organic compounds named as derivative of methane. THMs are generally by-products of chlorination of drinking water that contains organic material.

Troposhpere: The layer of the atmosphere closest to the earth's surface.

Trust Fund (CERCLA): A fund set up under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to help pay for cleanup of hazardous waste sites and for legal action to force those responsible for the sites to clean them up.

Tube Settler: Device using bundles of tubes to let solids in water settle to the bottom for removal by conventional sludge collection means; sometimes used in sedimentation basins and clarifiers to improve particle removal.

Tuberculation: Development or formation of small mounds of corrosion products on the inside of iron pipe. These tubercules roughen the inside of the pipe, increasing its resistance to water flow.

Tundra: A type of ecosystem dominated by lichens, mosses, grasses, and woody plants. Tundra is found at high latitudes (arctic tundra) and high altitudes (alpine tundra). Arctic tundra is underlain by permafrost and is usually saturated. (See: wetlands.)

Turbidimeter: A device that measures the density of suspended solids in a liquid.

Turbidity: 1. Haziness in air caused by the presence of particles and pollutants. 2. A cloudy condition in water due to suspended silt or organic matter.

U

Ultra Clean Coal (UCC): Coal that is washed, ground into fine particles, then chemically treated to remove sulfur, ash, silicone, and other substances; usually briquetted and coated with a sealant made from coal.

Ultraviolet Rays: Radiation from the sun that can be useful or potentially harmful. UV rays from one part of the spectrum (UV-A) enhance plant life and are useful in some medical and dental procedures; UV rays from other parts of the spectrum (UV-B) can cause skin cancer or other tissue damage. The ozone layer in the atmosphere partly shields us from ultraviolet rays reaching the earth's surface.

Unconfined Aquifer: An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

Underground Injection Control (UIC): The program under the Safe Drinking Water Act that regulates the use of wells to pump fluids into the ground.

Underground Sources of Drinking Water: Aquifers currently being used as a source of drinking water or those capable of supplying a public water system. They have a total dissolved solids content of 10,000 milligrams per liter or less, and are not "exempted aquifers." (See: exempted aquifer.)

Underground Storage Tank: A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals.

Unreasonable Risk: Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), "unreasonable adverse effects" means any unreasonable risk to man or the environment, taking into account the medical, economic, social, and environmental costs and benefits of any pesticide.

Unsaturated Zone: The area above the water table where soil pores are not fully saturated, although some water may be present.

Uranium Mill Tailings Piles: Former uranium ore processing sites that contain leftover radioactive materials (wastes), including radium and unrecovered uranium.

Uranium Mill-Tailings Waste Piles: Licensed active mills with tailings piles and evaporation ponds created by acid or alkaline leaching processes.

Urban Runoff: Storm water from city streets and adjacent domestic or commercial properties that carries pollutants of various kinds into the sewer systems and receiving waters.

Urea-Formaldehyde Foam Insulation: A material once used to conserve energy by sealing crawl spaces, attics, etc.; no longer used because emissions were found to be a health hazard.

User Fee: Fee collected from only those persons who use a particular service, as compared to one collected from the public in general.

Utility Load: The total electricity demand for a utility district.

V

Vapor Capture System: Any combination of hoods and ventilation system that captures or contains organic vapors so they may be directed to an abatement or recovery device.

Vapor Dispersion: The movement of vapor clouds in air due to wind, thermal action, gravity spreading, and mixing.

Vapor Plumes: Flue gases visible because they contain water droplets.

Variance: Government permission for a delay or exception in the application of a given law, ordinance, or regulation.

Vector: 1. An organism, often an insect or rodent, that carries disease. 2. Plasmids, viruses, or bacteria used to transport genes into a host cell. A gene is placed in the vector; the vector then "infects" the bacterium.

Vegetative Controls: Non-point source pollution control practices that involve vegetative cover to reduce erosion and minimize loss of pollutants.

Vehicle Miles Travelled (VMT): A measure of the extent of motor vehicle operation; the total number of vehicle miles travelled within a specific geo-

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graphic area over a given period of time.

Ventilation/Suction: The act of admitting fresh air into a space in order to replace stale or contaminated air: achieved by blowing air into the space. Similarly, suction represents the admission of fresh air into an interior space by lowering the pressure outside of the space, thereby drawing the contaminated air outward.

Venturi Scrubbers: Air pollution control devices that use water to remove particulate matter from emissions.

Vinyl Chloride: A chemical compound, used in producing some plastics, that is believed to be oncogenic.

Virgin Materials: Resources extracted from nature in their raw form, such as timber or metal ore.

Volatile: Any substance that evaporates readily.

Volatile Liquids: Liquids which easily vaporize or evaporate at room temperature.

Volatile Organic Compound (VOC): Any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.

Volatile Solids Those solids in water or othr liquids that are lost on ignition of the dry solids at 550° Centigrade.

Volatile Synthetic Organic Chemicals: Chemicals that tend to volatilize or evaporate.

Volume Reduction: Processing waste materials to decrease the amount of space they occupy, usually by compacting or shredding, incineration, or composting.

Volumetric Tank Test: One of several tests to determine the physical integrity of a storage tank; the volume of fluid in the tank is measured directly or calculated from product-level changes. A marked drop in volume indicates a leak.

Vulnerable Zone: An area over which the airborne concentration of a chemical accidentally released could reach the level of concern.

Vulnerability Analysis: Assessment of elements in the community that are susceptible to damage should a release of hazardous materials occur.

W

Waste: 1. Unwanted materials left over from a manufacturing process. 2. Refuse from places of human or animal habitation.

Waste Characterization: Identification of chemical and microbiological constituents of a waste material.

Waste Exchange: Arrangement in which companies exchange their wastes for the benefit of both parties.

Waste Feed: The continuous or intermittent flow of wastes into an incinerator.

Waste Load Allocation: 1. The maximum load of pollutants each discharger of waste is allowed to release into a particular waterway. Discharge limits are usually required for each specific water quality criterion being, or expected to be, violated. 2. The portion of a stream's total assimilative capacity assigned to an individual discharge.

Waste Minimization: Measures or techniques that reduce the amount of wastes generated during industrial production processes; term is also applied to recycling and other efforts to reduce the amount of waste going into the waste stream.

Waste Reduction: Using source reduction, recycling, or composting to prevent or reduce waste generation.

Waste Stream: The total flow of solid waste from homes, businesses, institutions, and manufacturing plants that are recycled, burned, or disposed of in landfills, or segments thereof such as the "residential waste stream" or the "recyclable waste stream."

Waste Treatment Lagoon: Impoundment made by excavation or earth fill for biological treatment of wastewater.

Waste Treatment Plant: A facility containing a series of tanks, screens, filters and other processes by which pollutants are removed from water.

Waste Treatment Stream: The continuous movement of waste from generator to treater and disposer.

Wastewater: The spent or used water from a home, community, farm, or industry that contains dissolved or suspended matter.

Wastewater Infrastructure: The plan or network for the collection, treatment, and disposal of sewage in a community. The level of treatment will depend on the size of the community, the type of discharge, and/or the designated use of the receiving water.

Wastewater Operations and Maintenance: Actions taken after construction to assure that facilities constructed to treat wastewater will be operated, maintained, and managed to reach prescribed effluent levels in an optimum manner.

Water Pollution: The presence in water of enough harmful or objectionable material to damage the water's quality.

Water Purveyor: A public utility, mutual water company, county water district, or municipality that delivers drinking water to customers.

Water Quality Criteria: Levels of water quality expected to render a body of water suitable for its designated use. Criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, farming, fish production, or industrial processes.

Water Quality Standards: State-adopted and EPA-approved ambient standards for water bodies. The standards prescribe the use of the water body and establish the water quality criteria that must be met to protect designated uses.

Water Quality-Based Limitations: Effluent limitations applied to dischargers when mere technology-based limitations would cause violations of water quality standards. Usually applied to discharges into small streams.

Water Quality-Based Permit: A permit with an effluent limit more stringent than one based on technology performance. Such limits may be necessary to protect the designated use of receiving waters (i.e., recreation, irrigation, industry or water supply).

Water Solubility: The maximum possible concentration of a chemical compound dissolved in water. If a substance is water soluble it can very readily disperse through the environment.

Water Storage Pond: An impound for liquid wastes designed to accomplish some degree of biochemical treatment.

Water Supplier: One who owns or operates a public water system.

Water Supply System: The collection, treatment, storage, and distribution of potable water from source to consumer.

Water Table: The level of groundwater.

Water Treatment Lagoon: An impound for liquid wastes designed to accom-

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plish some degree of biochemical treatment.

Water Well: An excavation where the intended use is for location, acquisition, development, or artificiial recharge of ground water.

Waterborne Disease Outbreak: The significant occurence of acute infection illness associated with drinking water from a public water system that is deficient in treatment, as determined by appropriate local or state agencies, or from untreated water sources.

Watershed: The land area that drains into a stream; the watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common point.

Weir: 1. A wall or plate placed in an open channel to measure the flow ofwater. 2. A wall or obstruction used to control flow from settling tanks and clarifiers to assure a uniform flow rate and avoid short-circuiting. (See: short-circuiting.)

Well: A bored, drilled, or driven shaft, or a dug hole whose depth is greater than the largest surface dimension and whose purpose is to reach underground water supplies or oil, or to store or bury fluids below ground.

Well Field: Area containing one or more wells that produce usable amounts of water or oil.

Well Injection: The subsurface emplacement of fluids into a well.

Well Monitoring: Measurement by on-site instruments or laboratory methods of well water quality.

Well Plug: A watertight, gastight seal installed in a bore hole or well to prevent movement of fluids.

Wellhead Protection Area: A protected surface and subsurface zone surrounding a well or wellfield supplying a public water system to keep contaminants from reaching the well water.

Wetlands: An area that is saturated by surface or ground water with vegetation adapted for life under those soil conditions, as in swamps, bogs, fens, marshes, and estuaries.

Wildlife Refuge: An area designated for the protection of wild animals, within which hunting and fishing are either prohibited or strictly controlled.

Wire-to-Wire Efficiency: The efficiency of a pump and motor together.

Wood-Burning-Stove Pollution: Air pollution caused by emissions of particulate matter, carbon monoxide, total suspended particulates, and polycyclic organic matter from wood-burning stoves.

Wood Treatment Facility: An industrial facility that treats lumber and other wood products for outdoor use. The process employs chromated copper arsenate, which is regulated as a hazardous material.

Working Level Month (WLM): A unit of measure used to determine cumulative exposure to radon.

Working Level (WL): A unit of measure for documenting exposure to radon decay products, the so-called "daughters". One working level is equal to approximately 200 picocuries per liter.

X Y Z

Xenobiote: Any biotum displaced from its normal habitat; a chemical foreign to a biological system.

Yard Waste: The part of solid waste composed of grass clippings, leaves, twigs, branches, and garden refuse.

Yellow-Boy: Iron oxide flocculent (clumps of solids in waste or water); usually observed as orange-yellow deposits in surface streams with excess iron content. (See: floc, flocculation.)

Yield: The quantity of water (expressed as a rate of flow or total quantity per year) that can be collected for a given use from surface or groundwater sources.

Z-list: OSHA's tables of toxic and hazardous air contaminants.

Zone of Aeration: The comparatively dry soil or rock located between the ground surface and the top of the water table.

Zone of Saturation: (See: saturated zone.)

Zooplankton: Tiny aquatic animals eaten by fish.

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Abbreviations And Acronyms

A

A&I: Alternative and Innovative (Wastewater Treatment System)

AA: Accountable Area: Adverse Action; Advices of Allowance Assistant Administrator; Associate Administrator; Atomic Absorption

AAEE: American Academy of Environmental Engineers

AANWR: Alaskan Arctic National Wildlife Refuge

AAP: Asbestos Action Program

AAPCO: American Association of Pesticide Control Officials

AARC: Alliance for Acid Rain Control

ABEL: EPA's computer model for analyzing a violator's ability to pay a civil penalty.

ABES: Alliance for Balanced Environmental Solutions

AC: Actual Commitment. Advisory Circular

A&C: Abatement and Control

ACA: American Conservation Association

ACBM: Asbestos-Containing Building Material

ACE: Alliance for Clean Energy

ACEEE: American Council for an Energy Efficient Economy

ACFM: Actual Cubic Feet Per Minute

ACL: Alternate Concentration Limit. Analytical Chemistry Laboratory

ACM: Asbestos-Containing Material

ACP: Agriculture Control Program (Water Quality Management)

ACP: Air Carcinogen Policy

ACQUIRE: Aquatic Information Retrieval

ACQR: Air Quality Control Region

ACS: American Chemical Society

ACT: Action

ACTS: Asbestos Contractor Tracking System

ACWA: American Clean Water Association

ACWM: Asbestos-Containing Waste Material

ADABA: Acceptable Data Base

ADB: Applications Data Base

ADI: Acceptable Daily Intake

ADP: Automated Data Processing

ADP: AHERA Designated Person

ADQ: Audits of Data Quality

ADR: Alternate Dispute Resolution

ADSS: Air Data Screening System

ADT: Average Daily Traffic

AEA: Atomic Energy Act

AEC: Associate Enforcement Counsels

AEE: Alliance for Environmental Education

AEERL: Air and Energy Engineering Research Laboratory

AEM: Acoustic Emission Monitoring

AERE: Association of Environmental and Resource Economists

AES: Auger Electron Spectrometry

AFA: American Forestry Association

AFCA: Area Fuel Consumption Allocation

AFCEE: Air Force Center for Environmental Excellence

AFS: AIRS Facility Subsystem

AFUG: AIRS Facility Users Group

AH: Allowance Holders

AHERA: Asbestos Hazard Emergency Response Act

AIC: Active to Inert Conversion

AICUZ: Air Installation Compatible Use Zones

AID: Agency for International Development

AIHC: American Industrial Health Council

AIP: Auto Ignition Point

AIRS: Aerometric Information Retrieval System

AL: Acceptable Level

ALA: Delta-Aminolevulinic Acid

ALA-O: Delta-Aminolevulinic Acid Dehydrates

ALAPO: Association of Local Air Pollution Control Officers

ALARA: As Low As Reasonably Achievable

ALC: Application Limiting Constituent

ALJ: Administrative Law Judge

ALMS: Atomic Line Molecular Spectroscopy

ALR: Action Leakage Rate

AMBIENS: Atmospheric Mass Balance of Industrially Emitted and Natural Sulfur

AMOS: Air Management Oversight System

AMPS: Automatic Mapping and Planning System

AMSA: Association of Metropolitan Sewer Agencies

ANC: Acid Neutralizing Capacity

ANPR: Advance Notice of Proposed Rulemaking

ANRHRD: Air, Noise, & Radiation Health Research Division/ORD

ANSS: American Nature Study Society

AOC: Abnormal Operating Conditions

AOD: Argon-Oxygen Decarbonization

AOML: Atlantic Oceanographic and Meteorological Laboratory

AP: Accounting Point

APA: Administrative Procedures Act

APCA: Air Pollution Control Association

APCD: Air Pollution Control District

APDS: Automated Procurement Documentation System

APHA: American Public Health Association

APRAC: Urban Diffusion Model for Carbon Monoxide from Motor Vehicle Traffic

APTI: Air Pollution Training Institute

APWA: American Public Works Association

AQ-7: Non-reactive Pollutant Modelling

AQCCT: Air-Quality Criteria and Control Techniques

AQCP: Air Quality Control Program

AQCR: Air-Quality Control Region

AQD: Air-Quality Digest

AQDHS: Air-Quality Data Handling System

AQDM: Air-Quality Display Model

AQMA: Air-Quality Maintenance Area

AQMP: Air-Quality Maintenance Plan

AQMP: Air-Quality Management Plan

AQSM: Air-Quality Simulation Model

AQTAD: Air-Quality Technical Assistance Demonstration

AR: Administrative Record

A&R: Air and Radiation

ARA: Assistant Regional Administrator

ARA: Associate Regional Administrator

ARAR: Applicable or Relevant and Appropriate Standards, Limitations, Criteria, and Requirements

ARB: Air Resources Board

ARC: Agency Ranking Committee

ARCC: American Rivers Conservation Council

ARCS: Alternative Remedial Contract Strategy

ARG: American Resources Group

ARIP: Accidental Release Information Program

ARL: Air Resources Laboratory

ARM: Air Resources Management

ARO: Alternate Regulatory Option

ARRP: Acid Rain Research Program

ARRPA: Air Resources Regional Pollution Assessment Model

ARS: Agricultural Research Service

ARZ: Auto Restricted Zone

AS: Area Source

ASC: Area Source Category

ASDWA: Association of State Drinking Water Administrators

ASHAA: Asbestos in Schools Hazard Abatement Act

ASIWCPA: Association of State and Interstate Water Pollution Control Administrators

ASMDHS: Airshed Model Data Handling System

ASRL: Atmospheric Sciences Research Laboratory

AST: Advanced Secondary (Wastewater) Treatment

ASTHO: Association of State and Territorial Health Officers

ASTM: American Society for Testing and Materials

ASTSWMO: Association of State and Territorial Solid Waste Management Officials

AT: Advanced Treatment. Alpha Track Detection

ATERIS: Air Toxics Exposure and Risk Information System

ATS: Action Tracking System

ATSDR: Agency for Toxic Substances and Disease Registry

ATTF: Air Toxics Task Force

AUSM: Advanced Utility Simulation Model

A/WPR: Air/Water Pollution Report

AWRA: American Water Resources Association

AWT: Advanced Wastewater Treatment

AWWA: American Water Works Association

AWWARF: American Water Works Association Research Foundation.

B

BAA: Board of Assistance Appeals

BAC: Biotechnology Advisory Committee

BACM: Best Available Control Measures

BACT: Best Available Control Technology

BADT: Best Available Demonstrated Technology

BaP: Benzo(a)Pyrene

BAP: Benefits Analysis Program

BART: Best Available Retrofit Technology

BASIS: Battelle's Automated Search Information System

BAT: Best Available Technology

BATEA: Best Available Treatment Economically Achievable

BCT: Best Control Technology

BCPCT: Best Conventional Pollutant Control Technology

BDAT: Best Demonstrated Achievable Technology

BDCT: Best Demonstrated Control Technology

BDT: Best Demonstrated Technology

BEJ: Best Engineering Judgement. Best Expert Judgment

BF: Bonafide Notice of Intent to Manufacture or Import (IMD/OTS)

BID: Background Information Document. Buoyancy Induced Dispersion

BIOPLUME: Model to Predict the Maximum Extent of Existing Plumes
BMP: Best Management Practice(s)
BMR: Baseline Monitoring Report
BO: Budget Obligations
BOA: Basic Ordering Agreement (Contracts)
BOD: Biochemical Oxygen Demand. Biological Oxygen Demand
BOF: Basic Oxygen Furnace
BOP: Basic Oxygen Process
BOPF: Basic Oxygen Process Furnace
BOYSNC: Beginning of Year Significant Non-Compliers
BP: Boiling Point
BPJ: Best Professional Judgment
BPT: Best Practicable Technology. Pest Practicable Treatment
BPWTT: Best Practical Wastewater Treatment Technology
BRS: Bibliographic Retrieval Service
BSI: British Standards Institute
BSO: Benzene Soluble Organics
BTZ: Below the Treatment Zone
BUN: Blood Urea Nitrogen

C

CA: Citizen Act. Competition Advocate. Cooperative Agreements. Corrective Action
CAA: Clean Air Act
CAA: Compliance Assurance Agreement
CAAA: Clean Air Act Amendments
CAER: Community Awareness and Emergency Response
CAFE: Corporate Average Fuel Economy
CAFO: Consent Agreement/Final Order
CAG: Carcinogenic Assessment Group
CAIR: Comprehensive Assessment of Information Rule
CALINE: California Line Source Model
CAMP: Continuous Air Monitoring Program
CAN: Common Account Number
CAO: Corrective Action Order
CAP: Corrective Action Plan. Cost Allocation Procedure. Criteria Air Pollutant
CAR: Corrective Action Report
CAS: Center for Automotive Safety
CAS: Chemical Abstract Service
CASAC: Clean Air Scientific Advisory Committee
CASLP: Conference on Alternative State and Local Practices
CATS: Corrective Action Tracking System
CAU: Carbon Adsorption Unit
CAU: Command Arithmetic Unit
CB: Continuous Bubbler
CBA: Chesapeake Bay Agreement. Cost Benefit Analysis
CBD: Central Business District
CBI: Compliance Biomonitoring Inspection
CBI: Confidential Business Information
CBOD: Carbonaceous Biochemical Oxygen Demand
CBP: Chesapeake Bay Program
CBP: County Business Patterns
CCA: Competition in Contracting Act
CCAA: Canadian Clean Air Act
CCAP: Center for Clean Air Policy
CCEA: Conventional Combustion Environmental Assessment
CCHW: Citizens Clearinghouse for Hazardous Wastes
CCID: Confidential Chemicals Identification System
CCMS/NATO: Committee on Challenges of a Modern Society/North Atlantic Treaty Organization
CCP: Composite Correction Plan
CC/RTS:Chemical Collection/Request Tracking System
CCTP: Clean Coal Technology Program
CD: Climatological Data
CDB: Consolidated Data Base
CDBA: Central Data Base Administrator
CDBG: Community Development Block Grant
CDD: Chlorinated dibenzo-p-dioxin
CDF: Chlorinated dibenzofuran
CDHS: Comprehensive Data Handling System
CDI: Case Development Inspection
CDM: Climatological Dispersion Model
CDM: Comprehensive Data Management
CDMQC: Climatological Dispersion Model with Calibration and Source Contribution
CDNS: Climatological Data National Summary
CDP: Census Designated Places
CDS: Compliance Data System
CE: Categorical Exclusion. Conditionally Exempt Generator
CEA: Cooperative Enforcement Agreement
CEA: Cost and Economic Assessment
CEAT: Contractor Evidence Audit Team
CEARC: Canadian Environmental Assessment Research Council
CEB: Chemical Element Balance
CECATS: CSB Existing Chemicals Assessment Tracking System
CEE: Center for Environmental Education
CEEM: Center for Energy and Environmental Management
CEI: Compliance Evaluation Inspection
CELRF: Canadian Environmental Law Research Foundation
CEM: Continuous Emission Monitoring
CEMS: Continuous Emission Monitoring System
CEPP: Chemical Emergency Preparedness Plan
CEQ: Council on Environmental Quality
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act (1980)
CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
CERT: Certificate of Eligibility
CF: Conservation Foundation
CFC: Chlorofluorocarbons
CFM: Chlorofluoromethanes
CFR: Code of Federal Regulations
CHABA: Committee on Hearing and Bio-Acoustics
CHAMP: Community Health Air Monitoring Program
CHEMNET: Chemical Industry Emergency Mutual Aid Network
CHESS: Community Health and Environmental Surveillance System
CHIP: Chemical Hazard Information Profiles
CI: Compression Ignition. Confidence Interval
CIAQ: Council on Indoor Air Quality
CIBL: Convective Internal Boundary Layer
CICA: Competition in Contracting Act
CICIS: Chemicals in Commerce Information System
CIDRS: Cascade Impactor Data Reduction System
CIMI: Committee on Integrity and Management Improvement
CIS: Chemical Information System. Contracts Information System
CLC: Capacity Limiting Constituents
CLEANS: Clinical Laboratory for Evaluation and Assessment of Toxic Substances
CLEVER: Clinical Laboratory for Evaluation and Validation of Epidemiologic Research
CLF: Conservation Law Foundation
CLIPS: Chemical List Index and Processing System
CLP: Contract Laboratory Program
CM: Corrective Measure
CMA: Chemical Manufacturers Association
CMB: Chemical Mass Balance
CME: Comprehensive Monitoring Evaluation
CMEL: Comprehensive Monitoring Evaluation Log
CMEP: Critical Mass Energy Project
CNG: Compresed Natural Gas
COCO: Contractor-Owned/Contractor-Operated
COD: Chemical Oxygen Demand
COH: Coefficient Of Haze
CPF: Carcinogenic Potency Factor
CPO: Certified Project Officer
CQA: Construction Quality Assurance
CR: Continuous Radon Monitoring
CROP: Consolidated Rules of Practice
CRP: Conservation Reserve Program
CRR: Center for Renewable Resources
CRSTER: Single Source Dispersion Model
CSI: Compliance Sampling Inspection
CSIN: Chemical Substances Information Network
CSO: Combined Sewer Overflow
CSPA: Council of State Planning Agencies
CSRL: Center for the Study of Responsive Law
CTARC: Chemical Testing and Assessment Research Commission
CTG: Control Techniques Guidelines
CV: Chemical Vocabulary
CW: Continuous working-level monitoring
CWA: Clean Water Act (aka FWPCA)
CWAP: Clean Water Action Project
CWTC: Chemical Waste Transportation Council
CZMA: Coastal Zone Management Act
CZARA: Coastal Zone Management Act Reauthorization Amendments

D

DAPSS: Document and Personnel Security System (IMD)
DCI: Data Call-In
DCO: Delayed Compliance Order
DCO: Document Control Officer
DDT: DichloroDiphenyl-Trichloroethane
DERs: Data Evaluation Records
DES: Diethylstilbesterol
DI: Diagnostic Inspection
DMR: Discharge Monitoring Report
DNA: Deoxyribonucleic acid
DO: Dissolved Oxygen
DOW: Defenders Of Wildlife
DPA: Deepwater Ports Act
DPD: Method of Measuring Chlorine Residual in Water.
DQO: Data Quality Objective
DRE: Destruction and Removal Efficiency
DRES: Dietary Risk Evaluation System
DRMS: Defense Reutilization and Marketing Service

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DRR: Data Review Record
DS: Dichotomous Sampler
DSAP: Data Self Auditing Program
DSCF: Dry Standard Cubic Feet
DSCM: Dry Standard Cubic Meter
DSS: Decision Support System
DSS: Domestic Sewage Study
DT: Detention Time
DT: Detectors (radon) damaged or lost
DU: Decision Unit. Ducks Unlimited
DUC: Decision Unit Coordinator
DWEL: Drinking Water Equivalent Level
DWS: Drinking Water Standard

E

EA: Endangerment Assessment. Enforcement Agreement. Environmental Action. Environmental Assessment. Environmental Audit
EAF: Electric Arc Furnaces
EAG: Exposure Assessment Group
EAP: Environmental Action Plan
EAR: Environmental Auditing Roundtable
EB: Emissions Balancing
EC: Emulsifiable Concentrate
EC: Environment Canada
EC: Effective Concentration
ECA: Economic Community for Africa
ECAP: Employee Counselling and Assistance Program
ECD: Electron Capture Detector
ECHH: Electro-Catalytic Hyper-Heaters
ECL: Environmental Chemical Laboratory
ECR: Enforcement Case Review
ECRA: Economic Cleanup Responsibility Act
ED: Effective Dose
EDA: Emergency Declaration Area
EDB: Ethylene Dibromide
EDC: Ethylene Dichloride
EDD: Enforcement Decision Document
EDF: Environmental Defense Fund
EDRS: Enforcement Document Retrieval System
EDS: Electronic Data System
EDS: Energy Data System
EDTA: Ethylene Diamine Triacetic Acid
EDX: Electronic Data Exchange
EDZ: Emission Density Zoning
EEA: Energy and Environmental Analysis
EECs: Estimated Environmental Concentrations
EER: Excess Emission Report
EERL: Eastern Environmental Radiation Laboratory
EERU: Environmental Emergency Response Unit
EESI: Environment and Energy Study Institute
EESL: Environmental Ecological and Support Laboratory
EETFC: Environmental Effects, Transport, and Fate Committee
EF: Emission Factor
EFO: Equivalent Field Office
EFTC: European Fluorocarbon Technical Committee
EGR: Exhaust Gas Recirculation
EH: Redox Potential
EHC: Environmental Health Committee
EHS: Extremely Hazardous Substance
EI: Emissions Inventory
EIA: Environmental Impact Assessment. Economic Impact Assessment
EIL: Environmental Impairment Liability
EIR: Endangerment Information Report
EIR: Environmental Impact Report
EIS: Environmental Impact Statement
EIS: Environmental Inventory System
EIS/AS: Emissions Inventory System/Area Source
EIS/PS: Emissions Inventory System/Point Source
EKMA: Empirical Kinetic Modeling Approach
EL: Exposure Level
ELI: Environmental Law Institute
ELR: Environmental Law Reporter
EM: Electromagnetic Conductivity
EMAP: Environmental Mapping and Assessment Program
EMAS: Enforcement Management and Accountability System
EMR: Environmental Management Report
EMS: Enforcement Management System
EMSL: Environmental Monitoring Support Laboratory
EMSL: Environmental Monitoring Systems Laboratory
EMTS: Environmental Monitoring Testing Site
EMTS: Exposure Monitoring Test Site
EO: Ethylene Oxide
EOC: Emergency Operating Center
EOF: Emergency Operations Facility (RTP)
EOP: End Of Pipe
EOT: Emergency Operations Team
EP: Earth Protectors
EP: Environmental Profile. End-use Product. Experimental Product. Extraction Procedure
EPAA: Environmental Programs Assistance Act
EPAAR: EPA Acquisition Regulations
EPCRA: Emergency Preparedness and Community Right to Know Act
EPACASR: EPA Chemical Activities Status Report
EPCA: Energy Policy and Conservation Act
EPD: Emergency Planning District
EPI: Environmental Policy Institute
EPIC: Environmental Photographic Interpretation Center
EPNL: Effective Perceived Noise Level
EPRI: Electric Power Research Institute
EPTC: Extraction Procedure Toxicity Characteristic
ER: Electrical Resistivity
ERA: Economic Regulatory Agency
ERAMS: Environmental Radiation Ambient Monitoring System
ERC: Emergency Response Commission
ERC: Emissions Reduction Credit
ERC: Environmental Research Center
ERCS: Emergency Response Cleanup Services
ERDA: Energy Research and Development Administration
ERD&DAA: Environmental Research, Development and Demonstration Authorization Act
ERL: Environmental Research Laboratory
ERNS: Emergency Response Notification System
ERP: Enforcement Response Policy
ERT: Emergency Response Team
ERTAQ: ERT Air Quality Model
ES: Enforcement Strategy
ESA: Endangered Species Act. Environmentally Sensitive Area
ESC: Endangered Species Committee
ESCA: Electron Spectroscopy for Chemical Analysis
ESCAP: Economic and Social Commission for Asia and the Pacific
ESECA: Energy Supply and Environmental Coordination Act
ESH: Environmental Safety and Health
ESP: Electrostatic Precipitators
ET: Emissions Trading
ETP: Emissions Trading Policy
ETS: Environmental Tobacco Smoke
EUP: End-Use Product
EUP: Experimental Use Permit
EWCC: Environmental Workforce Coordinating Committee
EXAMS: Exposure Analysis Modeling System
ExEx: Expected Exceedance

F

FACA: Federal Advisory Committee Act
FAN: Fixed Account Number
FATES: FIFRA and TSCA Enforcement System
FBC: Fluidized Bed Combustion
FCC: Fluid Catalytic Converter
FCCU: Fluid Catalytic Cracking Unit
FCO: Federal Coordinating Officer (in disaster areas)
FCO: Forms Control Officer
FDF: Fundamentally Different Factors
FDL: Final Determination Letter
FDO: Fee Determination Official
FE: Fugitive Emissions
FEDS: Federal Energy Data System
FEFx: Forced Expiratory Flow
FEIS: Fugitive Emissions Information System
FEL: Frank Effect Level
FEPCA: Federal Environmental Pesticide Control Act; enacted as amendments to FIFRA.
FERC: Federal Energy Regulatory Commission
FES: Factor Evaluation System
FEV: Forced Expiratory Volume
FEV1: Forced Expiratory Volume—one second
FEVI: Front End Volatility Index
FF: Federal Facilities
FFAR: Fuel and Fuel Additive Registration
FFDCA: Federal Food, Drug, and Cosmetic Act
FFF: Firm Financial Facility
FFFSG: Fossil-Fuel-Fired Steam Generator
FFIS: Federal Facilities Information System
FFP: Firm Fixed Price
FGD: Flue-Gas Desulfurization
FID: Flame Ionization Detector
FIFRA: Federal Insecticide, Fungicide, and Rodenticide Act
FIM: Friable Insulation Material
FINDS: Facility Index System
FIP: Final Implementation Plan
FIPS: Federal Information Procedures System
FIT: Field Investigation Team
FLETC: Federal Law Enforcement Training Center
FLM: Federal Land Manager
FLP: Flash Point
FLPMA: Federal Land Policy and Management Act
FMAP: Financial Management Assistance Project
F/M: Food to Microorganism Ratio
FML: Flexible Membrane Liner
FMP: Facility Management Plan
FMP: Financial Management Plan

FMS: Financial Management System
FMVCP: Federal Motor Vehicle Control Program
FOE: Friends Of the Earth
FOIA: Freedom Of Information Act
FOISD: Fiber Optic Isolated Spherical Dipole Antenna
FONSI: Finding Of No Significant Impact
FORAST: Forest Response to Anthropogenic Stress
FP: Fine Particulate
FPA: Federal Pesticide Act
FPAS: Foreign Purchase Acknowledgement Statements
FPD: Flame Photometric Detector
FPEIS: Fine Particulate Emissions Information System
FPM: Federal Personnel Manual
FPPA: Federal Pollution Prevention Act
FPR: Federal Procurement Regulation
FPRS: Federal Program Resources Statement
FPRS: Formal Planning and Supporting System
FR: Federal Register. Final Rulemaking
FRA: Federal Register Act
FREDS: Flexible Regional Emissions Data System
FRES: Forest Range Environmental Study
FRM: Federal Reference Methods
FRN: Federal Register Notice. Final Rulemaking Notice
FRS: Federal Reporting System
FS: Feasibility Study
FSA: Food Security Act
FSS: Facility Status Sheet
FSS: Federal Supply Schedule
FTP: Federal Test Procedure (for motor vehicles)
FTS: File Transfer Service
FTTS: FIFRA/TSCA Tracking System
FUA: Fuel Use Act
FURS: Federal Underground Injection Control Reporting System
FVMP: Federal Visibility Monitoring Program
FWCA: Fish and Wildlife Coordination Act
FWPCA: Federal Water Pollution and Control Act (aka CWA). Federal Water Pollution and Control Administration

G

GAAP: Generally Accepted Accounting Principles
GAC: Granular Activated Carbon
GACT: Granular Activated Carbon Treatment
GC/MS: Gas Chromatograph/Mass Spectograph
GCWR: Gross Combination Weight Rating
GDE: Generic Data Exemption
GEI: Geographic Enforcement Initiative
GEMS: Global Environmental Monitoring System
GEMS: Graphical Exposure Modeling System
GEP: Good Engineering Practice
GFF: Glass Fiber Filter
GFO: Grant Funding Order
GFP: Government-Furnished Property
GICS: Grant Information and Control System
GIS: Geographic Information Systems
GIS: Global Indexing System
GLC: Gas Liquid Chromatography
GLERL: Great Lakes Environmental Research Laboratory
GLNPO: Great Lakes National Program Office
GLP: Good Laboratory Practices
GLWQA: Great Lakes Water Quality Agreement
GMCC: Global Monitoring for Climatic Change
G/MI: Grams per mile
GOCO: Government-Owned/Contractor-Operated
GOGO: Government-Owned/Government-Operated
GOP: General Operating Procedures
GOPO: Government-Owned/Privately-Operated
GPAD: Gallons-per-acre per-day
GPG: Grams-per-Gallon
GPR: Ground-Penetrating Radar
GPS: Groundwater Protection Strategy
GR: Grab Radon Sampling
GRCDA: Government Refuse Collection and Disposal Association
GRGL: Groundwater Residue Guidance Level
GTN: Global Trend Network
GTR: Government Transportation Request
GVP: Gasoline Vapor Pressure
GVW: Gross Vehicle Weight
GVWR: Gross Vehicle Weight Rating
GW: Grab Working-Level Sampling. Groundwater
GWM: Groundwater Monitoring
GWPS: Groundwater Protection Standard
GWPS: Groundwater Protection Strategy

H

HA: Health Advisory
HAD: Health Assessment Document
HAP: Hazardous Air Pollutant
HAPEMS: Hazardous Air Pollutant Enforcement Management System
HAPPS: Hazardous Air Pollutant Prioritization System
HATREMS: Hazardous and Trace Emissions System
HAZMAT: Hazardous Materials
HAZOP: Hazard and Operability Study
HC: Hazardous Constituents
HC: Hydrocarbon
HCCPD: Hexachlorocyclopentadiene
HCP: Hypothermal Coal Process
HDD: Heavy-Duty Diesel
HDE: Heavy-Duty Engine
HDG: Heavy-Duty Gasoline-Powered Vehicle
HDPE: High Density Polyethylene
HDT: Highest Dose Tested in a study. Heavy-Duty Truck
HDV: Heavy-Duty Vehicle
HEAL: Human Exposure Assessment Location
HECC: House Energy and Commerce Committee
HEI: Health Effects Institute
HEM: Human Exposure Modeling
HEPA: High-Efficiency Particulate Air
HERS: Hyperion Energy Recovery System
HHE: Human Health and the Environment
HHV: Higher Heating Value
HI: Hazard Index
HI-VOL: High-Volume Sampler
HIWAY: A Line Source Model for Gaseous Pollutants
HLRW: High Level Radioactive Waste
HMIS: Hazardous Materials Information System
HMS: Highway Mobile Source
HMTA: Hazardous Materials Transportation Act
HMTR: Hazardous Materials Transportation Regulations
HOC: Halogenated Organic Carbons
HON: Hazardous Organic NESHAP
HOV: High-Occupancy Vehicle
HP: Horse Power
HPLC: High-Performance Liquid Chromatography
HPV: High Priority Violator
HQCDO: Headquarters Case Development Officer
HRS: Hazardous Ranking System
HRUP: High-Risk Urban Problem
HSDB: Hazardous Substance Data Base
HSL: Hazardous Substance List
HSWA: Hazardous and Solid Waste Amendments
HT: Hypothermally Treated
HTP: High Temperature and Pressure
HVIO: High Volume Industrial Organics
HW: Hazardous Waste
HWDMS: Hazardous Waste Data Management System
HWGTF: Hazardous Waste Groundwater Task Force
HWGTF: Hazardous Waste Groundwater Test Facility
HWLT: Hazardous Waste Land Treatment
HWM: Hazardous Waste Management
HWRTF: Hazardous Waste Restrictions Task Force
HWTC: Hazardous Waste Treatment Council

I

I/A: Innovative/Alternative
IA: Interagency Agreement
IAAC: Interagency Assessment Advisory Committee
IAG: Interagency Agreement
IAP: Incentive Awards Program. Indoor Air Pollution
IARC: International Agency for Research on Cancer
IATDB: Interim Air Toxics Data Base
IBT: Industrial Biotest Laboratory
ICAIR: Interdisciplinary Planning and Information Research
ICAP: Inductively Coupled Argon Plasma
ICB: Information Collection Budget
ICBN: International Commission on the Biological Effects of Noise
ICE: Industrial Combustion Emissions Model. Internal Combustion Engine
ICP: Inductively Coupled Plasma
ICR: Information Collection Request
ICRE: Ignitability, Corrosivity, Reactivity, Extraction
ICRP: International Commission on Radiological Protection
ICRU: International Commission of Radiological Units and Measurements
ICS: Incident Command System.
ICS: Institute for Chemical Studies.
ICS: Intermittent Control Strategies.
ICS; Intermittent Control System
ICWM: Institute for Chemical Waste Management
IDLH: Immediately Dangerous to Life and Health
IEB: International Environment Bureau
IEMP: Integrated Environmental Management Project
IES: Institute for Environmental Studies
IFB: Invitation for Bid
IFCAM: Industrial Fuel Choice Analysis Model
IFIS: Industry File Information System
IFPP: Industrial Fugitive Process Particulate
IFMS: Integrated Financial Management System
IGCC: Integrated Gasification Combined Cycle

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IGCI: Industrial Gas Cleaning Institute
IIS: Inflationary Impact Statement
IJC: International Joint Commission (on Great Lakes)
I/M: Inspection/Maintenance
IMM: Intersection Midblock Model
IMPACT: Integrated Model of Plumes and Atmosphere in Complex Terrain
IMPROVE: Interagency Monitoring of Protected Visual Environment
INPUFF: Gaussian Puff Dispersion Model
INT: Intermittent
IOB: Iron Ore Beneficiation
IOU: Input/Output Unit
IP: Inhalable Particles
IPM: Inhalable Particulate Matter. Integrated Pest Management
IPP: Implementation Planning Program. Integrated Plotting Package. Inter-media Priority Pollutant (document)
IPCS: International Program on Chemical Safety
IPP: Independent Power Producer
IRG: Interagency Review Group
IRLG: Interagency Regulatory Liaison Group (Composed of EPA, CPSC, FDA, and OSHA)
IRIS: Instructional Resources Information System. Integrated Risk Information System
IRM: Intermediate Remedial Measures
IRMC: Inter-Regulatory Risk Management Council
IRP: Installation Restoration Program
IRPTC: International Register of Potentially Toxic Chemicals
IRR: Institute of Resource Recovery
IRS: International Referral Systems
IS: Interim Status
ISAM: Indexed Sequential File Access Method
ISC: Industrial Source Complex
ISCL: Interim Status Compliance Letter
ISCLT: Industrial Source Complex Long Term Model
ISCST: Industrial Source Complex Short Term Model
ISD: Interim Status Document
ISE: Ion-specific electrode
ISMAP: Indirect Source Model for Air Pollution
ISPF: (IBM) Interactive System Productivity Facility
ISS: Interim Status Standards
ITC: Interagency Testing Committee
IUR: Inventory Update Rule
IWC: In-Stream Waste Concentration
IWS: Ionizing Wet Scrubber

J

JAPCA: Journal of Air Pollution Control Association
JCL: Job Control Language
JEC: Joint Economic Committee
JECFA: Joint Expert Committee of Food Additives
JLC: Justification for Limited Competition
JMPR: Joint Meeting on Pesticide Residues
JNCP: Justification for Non-Competitive Procurement
JOFOC: Justification for Other Than Full and Open Competition
JPA: Joint Permitting Agreement
JSD: Jackson Structured Design
JSP: Jackson Structured Programming
JTU: Jackson Turbidity Unit

L

LAA: Lead Agency Attorney
LADD: Lowest Acceptable Daily Dose
LAER: Lowest Achievable Emission Rate
LAI: Laboratory Audit Inspection
LAMP: Lake Acidification Mitigation Project
LC: Lethal Concentration. Liquid Chromatography
LCD: Local Climatological Data
LCL: Lower Control Limit
LCM: Life Cycle Management
LCRS: Leachate Collection and Removal System
LD: Land Disposal. Light Duty
LD L0: The lowest dosage of a toxic substance that kills test organisms.
LDC: London Dumping Convention
LDCRS: Leachate Detection. Collection. and Removal System
LDD: Light-Duty Diesel
LDIP: Laboratory Data Integrity Program
LDR: Land Disposal Restrictions
LDRTF: Land Disposal Restrictions Task Force
LDS: Leak Detection System
LDT: Lowest Dose Tested. Light-Duty Truck
LDV: Light-Duty Vehicle
LEL: Lowest Effect Level. Lower Explosive Limit
LEP: Laboratory Evaluation Program
LEPC: Local Emergency Planning Committee
LERC: Local Emergency Response Committee
LFL: Lower Flammability Limit
LGR: Local Governments Reimbursement Program
LI: Langelier Index
LIDAR: Light Detection and Ranging
LIMB: Limestone-Injection Multi-Stage Burner
LLRW: Low Level Radioactive Waste
LMFBR: Liquid Metal Fast Breeder Reactor
LOAEL: Lowest-Observed-Adverse-Effect-Level
LUIS: Label Use Information System

M

MAPSIM: Mesoscale Air Pollution Simulation Model
MBAS: Methylene-Blue-Active Substances
MEP: Multiple Extraction Procedure
MOE: Margin Of Exposure
MOS: Margin of Safety
MP: Manufacturing-use Product
MP: Melting Point
MPN: Maximum Possible Number
MRF: Materials Recovery Facility
MRID: Master Record Identification number
MRL: Maximum-Residue Limit (Pesticide Tolerance)
MSW: Municipal Solid Waste
MTD: Maximum Tolerated Dose
MUP: Manufacturing-Use Product
MUTA: Mutagenicity

N

NCWS: Non-Community Water System
NETA: National Environmental Training Association
NFRAP: No Further Remedial Action Planned
NICT: National Incident Coordination Team
NIOSH: National Institute of Occupational Safety and Health
NIPDWR: National Interim Primary Drinking Water Regulations
NISAC: National Industrial Security Advisory Committee
NOA: Notice of Arrival
NOAC: Nature of Action Code
NOAEL: No Observable Adverse Effect Level
NPHAP: National Pesticide Hazard Assessment Program
NSDWR: National Secondary Drinking Water Regulations
NSEC: National System for Emergency Coordination
NSEP: National System for Emergency Preparedness
NSR: New Source Review
NTP: National Toxicology Program
NTNCWS: Non-Transient Non-Community Water System
NTU: Nephlometric Turbidity Unit

O

OCD: Offshore and Coastal Dispersion
OF: Optional Form
OLTS: On Line Tracking System
O&M: Operations and Maintenance
ORM: Other Regulated Material
ORP: Oxidation-Reduction Potential

P

PAI: Performance Audit Inspection (CWA)
PAI: Pure Active Ingredient compound
PAM: Pesticide Analytical Manual
PAT: Permit Assistance Team (RCRA)
PATS: Pesticide Action Tracking System
PATS: Pesticides Analytical Transport Solution
PBA: Preliminary Benefit Analysis (BEAD)
PCA: Principle Component Analysis
PCM: Phase Contrast Microscopy
PCN: Policy Criteria Notice
PCO: Pest Control Operator
PDCI: Product Data Call-In
PFCRA: Program Fraud Civil Remedies Act
PHC: Principal Hazardous Constituent
PHSA: Public Health Service Act
PI: Preliminary Injunction. Program Information
PIC: Products of Incomplete Combustion
PIGS: Pesticides in Groundwater Strategy
PIMS: Pesticide Incident Monitoring System
PIN: Pesticide Information Network
PIN: Procurement Information Notice
PIP: Public Involvement Program
PIPQUIC: Program Integration Project Queries Used in Interactive Command
PIRG: Public Interest Research Group
PIRT: Pretreatment Implementation Review Task Force
PITS: Project Information Tracking System
PLIRRA: Pollution Liability Insurance and Risk Retention Act
PLM: Polarized Light Microscopy
PLUVUE: Plume Visibility Model
PM: Particulate Matter
PM10: Particulate Matter (nominally 10m and less)
PM15: Particulate Matter (nominally 15m and less)
PMEL: Pacific Marine Environmental Laboratory
PMN: Premanufacture Notification
PMNF: Premanufacture Notification Form

PMR: Pollutant Mass Rate
PMRS: Performance Management and Recognition System
PMS: Program Management System
PNA: Polynuclear Aromatic Hydrocarbons
PO: Project Officer
POC: Point Of Compliance
POE: Point Of Exposure
POGO: Privately-Owned/ Government-Operated
POHC: Principal Organic Hazardous Constituent
POI: Point Of Interception
POLREP:Pollution Report
POM: Particulate Organic Mat ter. Polycyclic Organic Matter
POR: Program of Requirements
POTW: Publicly Owned Treatment Works
POV: Privately Owned Vehicle
PP: Program Planning
PPA: Planned Program Accomplishment
PPB: Parts Per Billion
PPIC: Pesticide Programs Information Center
PPIS: Pesticide Product Information System
PPM/PPB: Parts per million/ parts per billion
PPMAP: Power Planning Modeling Application Procedure
PPSP: Power Plant Siting Program
PPT: Parts Per Trillion
PPTH: Parts Per Thousand
PQUA: Preliminary Quantitative Usage Analysis
PR: Preliminary Review
PRA: Paperwork Reduction Act
PRA: Planned Regulatory Action
PRATS: Pesticides Regulatory Action Tracking System
PRC: Planning Research Corporation
PRI: Periodic Reinvestigation
PRM: Prevention Reference Manuals
PRN: Pesticide Registration Notice
PRP: Potentially Responsible Party
PRZM: Pesticide Root Zone Model
PS: Point Source
PSAM: Point Source Ambient Monitoring
PSC: Program Site Coordinator
PSD: Prevention of Significant Deterioration
PSES: Pretreatment Standards for Existing Sources
PSI: Pollutant Standards Index
PSI: Pounds Per Square Inch
PSI: Pressure Per Square Inch
PSIG: Pressure Per Square Inch Gauge
PSM: Point Source Monitoring
PSNS: Pretreatment Standards for New Sources
PSU: Primary Sampling Unit
PTDIS: Single Stack Meteorological Model in EPA UNAMAP Series
PTE: Potential to Emit
PTFE: Polytetrafluoroethylene (Teflon)
PTMAX: Single Stack Meteorological Model in EPA UNAMAP series
PTPLU: Point Source Gaussian Diffusion Model
PUC: Public Utility Commission
PV: Project Verification
PVC: Polyvinyl Chloride
PWS: Public Water Supply/ System
PWSS: Public Water Supply System

Q

QAC: Quality Assurance Coordinator
QA/QC: Quality Assistance/ Quality Control
QAMIS: Quality Assurance Management and Information System
QAO: Quality Assurance Officer
QAPP: Quality Assurance Program (or Project) Plan
QAT: Quality Action Team
QBTU: Quadrillion British Thermal Units
QC: Quality Control
QCA: Quiet Communities Act
QCI: Quality Control Index
QCP: Quiet Community Program
QNCR: Quarterly Noncompliance Report
QUA: Qualitative Use Assessment
QUIPE: Quarterly Update for Inspector in Pesticide Enforcement

R

RA: Reasonable Alternative. Regulatory Alternatives. Regulatory Analysis. Remedi al Action. Resource Alloca tion. Risk Analysis. Risk Assessment
RAATS: RCRA Administrate Action Tracking System
RAC: Radiation Advisory Committee
RAC: Regional Asbestos Coordinator
RAC: Response Action Coordinator
RACM: Reasonably Available Control Measures
RACT: Reasonably Available Control Technology
RAD: Radiation Adsorbed Dose (unit of measurement of radiation absorbed by humans)
RADM: Random Walk Advection and Dispersion Model
RADM: Regional Acid Deposition Model
RAM: Urban Air Quality Model for Point and Area Source in EPA UNAMAP Series
RAMP: Rural Abandoned Mine Program
RAMS: Regional Air Monitoring System
RAP: Radon Action Program
RAP: Reregistration Assessment Panel
RAP: Remedial Accomplishment Plan
RAP: Response Action Plan
RAPS: Regional Air Pollution Study
RARG: Regulatory Analysis Review Group
RAS: Routine Analytical Service
RAT: Relative Accuracy Test
RB: Request for Bid
RC: Responsibility Center
RCC: Radiation Coordinating Council
RCDO: Regional Case Development Officer
RCO: Regional Compliance Officer
RCP: Research Centers Program
RCRA: Resource Conservation and Recovery Act
RCRIS: Resource Conservation and Recovery Information System
RD/RA: Remedial Design/ Remedial Action
R&D: Research and Development
RD&D: Research, Development and Demonstration
RDF: Refuse-Derived Fuel
rDNA: Recombinant DNA
RDU: Regional Decision Units
RDV: Reference Dose Values
RE: Reasonable Efforts
RE: Reportable Event
REAP: Regional Enforcement Activities Plan
REE: Rare Earth Elements
REEP: Review of Environmental Effects of Pollutants
REM (Roentgen Equivalent Man)
REM/FIT: Remedial/Field Investigation Team
REMS: RCRA Enforcement Management System
REP: Reasonable Efforts Program
REPS: Regional Emissions Projection System
RESOLVE: Center for Environmental Conflict Resolution
RF: Response Factor
RFA: Regulatory Flexibility Act
RFB: Request for Bid
RFD: Reference Dose Values
RFI: Remedial Field Investigation
RFP: Reasonable Further Programs. Request for Proposal
RHRS: Revised Hazard Ranking System
RI: Reconnaissance Inspection
RI: Remedial Investigation
RIA: Regulatory Impact Analysis
RIA: Regulatory Impact Assessment
RIC: Radon Information Center
RICC: Retirement Information and Counseling Center
RICO: Racketeer Influenced and Corrupt Organizations Act
RI/FS: Remedial Information/ Feasibility Study
RIM: Regulatory Interpretation Memorandum
RIN: Regulatory Identifier Number
RIP: RCRA Implementation Plan
RISC: Regulatory Information Service Center
RJE: Remote Job Entry
RLL: Rapid and Large Leakage (Rate)
RMCL: Recommended Maximum Contaminant Level (this phrase being discontinued in favor of MCLG)
RMDHS: Regional Model Data Handling System
RMIS: Resources Management Information System
RNA: Ribonucleic Acid
ROADCHEM: Roadway Version that Includes Chemical Reactions of BI, NO_2, and O_3
ROADWAY: A Model to Predict Pollutant Concentrations Near a Roadway
ROC: Record Of Communication
RODS: Records Of Decision System
ROG: Reactive Organic Gases
ROLLBACK: A Proportional Reduction Model
ROM: Regional Oxidant Model
ROMCOE: Rocky Mountain Center on Environment
ROP: Regional Oversight Policy
ROPA: Record Of Procurement Action
RP: Radon Progeny Integrated Sampling. Respirable Particulates. Responsible Party
RPAR: Rebuttable Presumption Against Registration
RPM: Reactive Plume Model. Remedial Project Manager
RQ: Reportable Quantities
RRC: Regional Response Center
RRT: Regional Response Team
RRT: Requisite Remedial Technology
RS: Registration Standard
RSCC: Regional Sample Control Center
RSD: Risk-Specific Dose
RSE: Removal Site Evaluation
RTCM: Reasonable Transportation Control Measure
RTDM: Rough Terrain Diffusion Model
RTECS: Registry of Toxic Effects of Chemical Substances
RTM: Regional Transport Model
RUP: Restricted Use Pesticide
RVP: Reid Vapor Pressure
RWC: Residential Wood Combustion

S

S&A: Sampling and Analysis. Surveillance and Analysis
SAB: Science Advisory Board
SAC: Suspended and Cancelled Pesticides

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SAEWG: Standing Air Emissions Work Group
SAIC: Special-Agents-In-Charge
SAIP: Systems Acquisition and Implementation Program
SAMWG: Standing Air Monitoring Work Group
SANE: Sulfur and Nitrogen Emissions
SANSS: Structure and Nomenclature Search System
SAP: Scientific Advisory Panel
SAR: Start Action Request. Structural Activity Relationship (of a qualitative assessment)
SARA: Superfund Amendments and Reauthorization Act of 1986
SAROAD: Storage and Retrieval Of Aerometric Data
SAS: Special Analytical Service. Statistical Analysis System
SASS: Source Assessment Sampling System
SAV: Submerged Aquatic Vegetation
SC: Sierra Club
SCAP: Superfund Consolidated Accomplishments Plan
SCBA: Self-Contained Breathing Apparatus
SCC: Source Classification Code
SCD/SWDC: Soil or Soil and Water Conservation District
SCFM: Standard Cubic Feet Per Minute
SCLDF: Sierra Club Legal Defense Fund
SCR: Selective Catalytic Reduction
SCRAM: State Consolidated RCRA Authorization Manual
SCRC: Superfund Community Relations Coordinator
SCS: Supplementary Control Strategy/System
SCSA: Soil Conservation Society of America
SCSP: Storm and Combined Sewer Program
SCW: Supercritical Water Oxidation
SDC: Systems Decision Plan
SDWA: Safe Drinking Water Act
SEA: State Enforcement Agreement
SEA: State/EPA Agreement
SEAM: Surface, Environment, and Mining
SEAS: Strategic Environmental Assessment System
SEIA: Socioeconomic Impact Analysis
SEM: Standard Error of the Means
SEP: Standard Evaluation Procedures
SEPWC: Senate Environment and Public Works Committee
SERC: State Emergency Planning Commission
SES: Secondary Emissions Standard
SETS: Site Enforcement Tracking System
SF: Standard Form. Superfund
SFA: Spectral Flame Analyzers
SFDS: Sanitary Facility Data System
SFFAS: Superfund Financial Assessment System
SFIREG: State FIFRA Issues Research and Evaluation Group
SFS: State Funding Study
SHORTZ: Short Term Terrain Model
SHWL: Seasonal High Water Level
SI: International System of Units. Site Inspection. Surveillance Index. Spark Ignition
SIC: Standard Industrial Classification
SICEA: Steel Industry Compliance Extension Act
SIMS: Secondary Ion-Mass Spectrometry
SIP: State Implementation Plan
SITE: Superfund Innovative Technology Evaluation
SLAMS: State/Local Air Monitoring Station
SLSM: Simple Line Source Model
SMART: Simple Maintenance of ARTS
SMCL: Secondary Maximum Contaminant Level
SMCRA: Surface Mining Control and Reclamation Act
SME: Subject Matter Expert
SMO: Sample Management Office
SMOA: Superfund Memorandum of Agreement
SMSA: Standard Metropolitan Statistical Area
SNA: System Network Architecture
SNAAQS: Secondary National Ambient Air Quality Standards
SNAP: Significant Noncompliance Action Program
SNARL: Suggested No Adverse Response Level
SNC: Significant Noncompliers
SNUR: Significant New Use Rule
SOC: Synthetic Organic Chemicals
SOCMI: Synthetic Organic Chemicals Manufacturing Industry
SOTDAT: Source Test Data
SOW: Scope Of Work
SPAR: Status of Permit Application Report
SPCC: Spill Prevention, Containment, and Countermeasure
SPE: Secondary Particulate Emissions
SPF: Structured Programming Facility
SPI: Strategic Planning Initiative
SPLMD: Soil-pore Liquid Monitoring Device
SPMS: Special Purpose Monitoring Stations
SPMS: Strategic Planning and Management System
SPOC: Single Point Of Contact
SPS: State Permit System
SPSS: Statistical Package for the Social Sciences
SPUR: Software Package for Unique Reports
SQBE: Small Quantity Burner Exemption
SQG: Small Quantity Generator
SRAP: Superfund Remedial Accomplishment Plan
SRC: Solvent-Refined Coal
SRM: Standard Reference Method
SRP: Special Review Procedure
SRR: Second Round Review. Submission Review Record
SRTS: Service Request Tracking System
SS: Settleable Solids. Superfund Surcharge. Suspended Solids
SSA: Sole Source Aquifer
SSAC: Soil Site Assimilated Capacity
SSC: State Superfund Contracts
SSD: Standards Support Document
SSEIS: Standard Support and Environmental Impact Statement. Stationary Source Emissions and Inventory System
SSI: Size Selective Inlet
SSMS: Spark Source Mass Spectrometry
SSO: Source Selection Official
SSTS: Section Seven Tracking System
SSURO: Stop Sale, Use and Removal Order
STAPPA: State and Territorial Air Pollution
STALAPCO: State and Local Air- Pollution Control Officials
STAR: Stability Wind Rose. State Acid Rain Projects
STEL: Short Term Exposure Limit
STEM: Scanning Transmission-Electron Microscope
STN: Scientific and Technical Information Network
STORET: Storage and Retrieval of Water-Related Data
STP: Sewage Treatment Plant. Standard Temperature and Pressure
SUP: Standard Unit of Processing
SURE: Sulfate Regional Experiment Program
SV: Sampling Visit
SW: Slow Wave
SWC: Settlement With Conditions
SWDA: Solid Waste Disposal Act
SWIE: Southern Waste Information Exchange
SWMU: Solid Waste Management Unit
SWTR: Surface Water Treatment Rule
SYSOP: Systems Operator

T

TAG: Technical Assistance Grant
TALMS: Tunable Atomic Line Molecular Spectroscopy
TAMS: Toxic Air Monitoring System
TAMTAC: Toxic Air Monitoring System Advisory Committee
TAP: Technical Assistance Program
TAPDS: Toxic Air Pollutant Data System
TAS: Tolerance Assessment System
TBT: Tributyltin
TC: Target Concentration. Technical Center. Toxicity Characteristics. Toxic Concentration:
TCDD: Dioxin (Tetrachlorodibenzo-p-dioxin)
TCDF: Tetrachlorodi-benzofurans
TCE: Trichloroethylene
TCLP: Total Concentrate Leachate Procedure. Toxicity Characteristic Leachate Procedure
TCM: Transportation Control Measure
TCP: Transportation Control Plan. Trichloroethylene. Trichloropropane
TCRI: Toxic Chemical Release Inventory
TD: Toxic Dose
TDS: Total Dissolved Solids
TEAM: Total Exposure Assessment Model
TEC: Technical Evaluation Committee
TEG: Tetraethylene Glycol
TEGD: Technical Enforcement Guidance Document
TEM: Texas Episodic Model
TEP: Typical End-use Product. Technical Evaluation Panel
TERA: TSCA Environmental Release Application
TES: Technical Enforcement Support
TEXIN: Texas Intersection Air Quality Model
TGO: Total Gross Output
TGAI: Technical Grade of the Active Ingredient
TGP: Technical Grade Product
THC: Total Hydrocarbons
THM: Trihalomethane
TI: Temporary Intermittent
TI: Therapeutic Index
TIBL: Thermal Internal Boundary Layer
TIC: Technical Information Coordinator. Tentatively Identified Compounds
TIM: Technical Information Manager
TIP: Transportation Improvement Program
TIS: Tolerance Index System
TISE: Take It Somewhere Else
TITC: Toxic Substance Control Act Interagency Testing Committee
TLV: Threshold Limit Value
TLV-C: TLV-Ceiling

TLV-STEL: TLV-Short Term Exposure Limit
TLV-TWA: TLV-Time Weighted Average
TMRC: Theoretical Maximum Residue Contribution
TNCWS: Transient Non-Community Water System
TNT: Trinitrotoluene
TO: Task Order
TOA: Trace Organic Analysis
TOC: Total Organic Carbon/Compound
TOX: Tetradichloroxylene
TP: Technical Product
TPC: Testing Priorities Committee
TPI: Technical Proposal Instructions
TPQ: Threshold Planning Quantity
TPSIS: Transportation Planning Support Information System
TPTH: Triphenyltinhydroxide
TPY: Tons Per Year
TQM: Total Quality Management
T-R: Transformer-Rectifier
TRC: Technical Review Committee
TRD: Technical Review Document
TRI: Toxic Release Inventory
TRIP: Toxic Release Inventory Program
TRIS: Toxic Chemical Release Inventory System
TRLN: Triangle Research Library Network
TRO: Temporary Restraining Order
TSA: Technical Systems Audit
TSCA: Toxic Substances Control Act
TSCATS: TSCA Test Submissions Database
TSCC: Toxic Substances Coordinating Committee
TSD: Technical Support Document
TSDF: Treatment, Storage, and Disposal Facility
TSDG: Toxic Substances Dialogue Group
TSI: Thermal System Insulation
TSM: Transportation System Management
TSO: Time Sharing Option
TSP: Total Suspended Particulates
TSS: Total Suspended (non-filterable) Solids
TTFA: Target Transformation Factor Analysis
TTHM: Total Trihalomethane
TTO: Total Toxic Organics
TTY: Teletypewriter
TVA: Tennessee Valley Authority
TWA: Time Weighted Average
TWS: Transient Water System
TZ: Treatment Zone

U

UAC: User Advisory Committee
UAM: Urban Airshed Modal
UAO: Unilateral Administrative Order
UAPSP: Utility Acid Precipitation Study Program
UAQI: Uniform Air Quality Index
UARG: Utility Air Regulatory Group
UCC: Ultra Clean Coal
UCCI: Urea-Formaldehyde Foam Insulation
UCL: Upper Control Limit
UDMH: Unsymmetrical Dimethyl Hydrazine
UEL: Upper Explosive Limit
UFL: Upper Flammability Limit
UIC: Underground Injection Control
UMTRCA: Uranium Mill Tailings Radiation Control Act
UNAMAP: Users' Network for Applied Modeling of Air Pollution
UNEP: United Nations Environment Program
USC: Unified Soil Classification
USDW: Underground Sources of Drinking Water
USFS: United States Forest Service
USP: U.S. Pharmacopeia
UST: Underground Storage Tank
UTM: Universal Transverse Mercator
UTP: Urban Transportation Planning
UV: Ultraviolet
UZM: Unsaturated Zone Monitoring

V

VALLEY: Meteorological Model to Calculate Concentrations on Elevated Terrain
VCM: Vinyl Chloride Monomer
VE: Visual Emissions
VEO: Visible Emission Observation
VHS: Vertical and Horizontal Spread Model
VHT: Vehicle-Hours of Travel
VISTTA: Visibility Impairment from Sulfur Transformation and Transport in the Atmosphere
VKT: Vehicle Kilometers Traveled
VMT: Vehicle Miles Traveled
VOC: Volatile Organic Compounds
VOS: Vehicle Operating Survey
VOST: Volatile Organic Sampling Train
VP: Vapor Pressure
VSD: Virtually Safe Dose
VSI: Visual Site Inspection
VSS: Volatile Suspended Solids

W

WA: Work Assignment
WADTF: Western Atmospheric Deposition Task Force
WAP: Waste Analysis Plan
WB: Wet Bulb
WCED: World Commission on Environment and Development
WDROP: Distribution Register of Organic Pollutants in Water
WENDB: Water Enforcement National Data Base
WERL: Water Engineering Research Laboratory
WHO: World Health Organization
WHWT: Water and Hazardous Waste Team
WICEM: World Industry Conference on Environmental Management
WL: Warning Letter
WL: Working Level (radon measurement)
WLA/TMDL: Wasteload Allocation/Total Maximum Daily Load
WLM: Working Level Months
WMO: World Meteorological Organization
WPCF: Water Pollution Control Federation
WQS: Water Quality Standard
WRC: Water Resources Council
WRDA: Water Resources Development Act
WRI: World Resources Institute
WS: Work Status
WSF: Water Soluble Fraction
WSRA: Wild and Scenic Rivers Act
WSTB: Water Sciences and Technology Board
WSTP: Wastewater Sewage Treatment Plant
WWEMA: Waste and Wastewater Equipment Manufacturers Association
WWF: World Wildlife Fund
WWTP: Wastewater Treatment Plant
WWTU: Wastewater Treatment Unit

Z

ZHE: Zero Headspace Extractor
ZOI: Zone Of Incorporation
ZRL: Zero Risk Level

APPENDIX U

ECOLOGICAL RISK ASSESSMENT

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LIST OF ACRONYMS AND ABBREVIATIONS

The following list represents many of the acronyms and abbreviations appearing frequently in the text of the Ecological Risk Assessment (Appendix U) of the Agriculture Street Landfill Remedial Removal Integrated Investigation reported. All acronyms and abbreviations are defined within the text; this list is provided as a reference guide for the reader.

ASL	Agriculture Street Landfill
ATSDR	Agency for Toxic Substances Disease Registry
AWQC	Ambient Water Quality Criteria
BAF	Bioaccumulation Factor
BHC	Benzene Hexachloride
BW	Body Weight
CEC	Cation Exchange
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESARS	Chemical Evaluation Search and Retrieval System
COPC	Chemical of Potential Ecological Concern
DNA	Deoxyribonucleic Acid
DW	Dry Weight
ED	Exposure Duration
EE	Estimated Exposure
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
FOD	Frequency of Detection
FOE	Frequency of Exceedence
FS	Feasibility Study
HSDB	Hazardous Substance Database
HQ	Hazard Quotient
IDL	Instrument Detection Limit
IR	Ingestion Rate
IRIS	Integrated Risk Information System
LADWF	Louisiana Department of Wildlife and Fisheries
LDEQ	Louisiana Department of Environmental Quality
LOAEL	Lowest Observed Adverse Effect Level
NIOSH	National Institute of Occupational Safety and Health
NLM	National Library of Medicine
NOAEL	No Observed Adverse Effect Level

OHM/TADS	Oil and Hazardous Materials/Technical Assistance Database
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PUF	Plant Uptake Factor
QA/QC	Quality Assurance/Quality Control
RBSC	Risk-Based Soil Concentration
RME	Reasonable Maximum Exposure
RNA	Ribonucleic Acid
RRII	Remedial Removal Integrated Investigation
RTEC	Registry of Toxic Effects of Chemical Substances
SOPC	Stressor of Potential Ecological Concern
SUF	Site Use Factor
TBV	Toxicity Benchmark Value
TEF	Toxicity Equivalency Factor
TRV	Toxicity Reference Value
UCL	Upper Confidence Limit
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

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U.1 INTRODUCTION

As part of the Remedial Removal Integrated Investigation (RRII) and Feasibility Study (FS) at the Agriculture Street Landfill (ASL) site, Ecology and Environment, Inc., (E & E) conducted an Ecological Risk Assessment (ERA) in accordance with ERA guidance (United States Environmental Protection Agency [EPA] 1992a, 1989a, 1989b, and 1986a). The objective of the baseline ERA was to evaluate potential ecological risks, in the absence of remedial action, to wildlife that inhabit or potentially use the undeveloped portion of the former landfill (undeveloped landfill) and adjacent canals.

Due to schedule requirements, a two-phase approach was used for the ERA. In Phase I, surface soil data from the undeveloped landfill, generated during the Expanded Site Inspection (ESI) conducted in 1993, were evaluated. Based upon this evaluation, a preliminary list of chemical of potential concern (COPCs) in surface soil was developed, potential ecological receptors were selected, and an ecological exposure model, toxicity reference values (TRVs), and site-specific risk-based soil concentrations (RBSCs) for each COPC were developed. A RBSC is a chemical concentration in soil that corresponds to a hazard quotient (HQ) of 1 for a given receptor. For each receptor identified in the Phase I ERA, RBSCs were developed based on the most conservative exposure parameters and ecotoxicological values. A conservative estimate of potential risks to receptors in the undeveloped landfill area from exposure to surface soil COPCs also was developed during the Phase I ERA. The Phase I ERA report is included as Section U.2.

In Phase II, RRII surface soil data were compared with site-specific RBSCs calculated in Phase to identify potential undeveloped landfill surface soil COPCs associated with RRII data. Once COPCs were identified, potential risks to receptors in the undeveloped landfill

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area were calculated. As discussed in Section U.3, the Phase II ERA included an evaluation of potential risks to ecological receptors from exposure to soil COPCs not detected during the ESI in addition to surface water and sediment COPCs within Florida Avenue Canal and Peoples Avenue Canal.

References consulted in preparing the ERA are listed in Section U.4, while figures and tables cited in the text are grouped in Section U.5 and Appendix V, respectively.

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U.2 PHASE I ECOLOGICAL RISK ASSESSMENT

U.2.1 INTRODUCTION

A Phase I ERA was performed for the undeveloped landfill to generate site-specific RBSCs for comparison to data generated during the RRII. In addition to generating RBSCs, potential ecological risks to wildlife from exposure to contaminants associated with site surface soil were identified and estimated in general terms. Potential ecological risks associated with Florida Avenue Canal and Peoples Avenue Canal are addressed in the Phase II ERA (see Section U.3).

U.2.1.1 Objectives

The primary objective of the Phase I ERA was to calculate site-specific, receptor-specific RBSCs for COPCs to rapidly screen RRII surface soil data during the Phase II ERA. Secondary objectives were:

- To characterize ecosystems, habitats, and receptors on the undeveloped landfill that are potentially adversely affected by site-related surface soil COPCs; and
- To develop the exposure parameters, models, and TRVs used to calculate receptor-specific HQs and RBSCs for surface soil COPCs.

U.2.1.2 Scope

In the Phase I ERA, ESI undeveloped landfill surface soil data were evaluated to generate a preliminary list of COPCs, select appropriate measurement species, develop exposure models and TRVs, and calculate RBSCs for all identified COPCs. In developing

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Zinc

Zinc is a naturally occurring element that can be found in a variety of compounds. Zinc has many industrial uses including galvanizing steel and manufacturing zinc-containing alloys such as brass. Zinc is an essential nutrient, and an inadequate amount of zinc in the diet will lead to adverse health effects.

People are exposed to low concentrations of zinc in air, water, soil, and food. Sources of zinc exposure include drinking water containing elevated levels of zinc and breathing air containing elevated levels of zinc from galvanizing, smelting, welding, or brass foundry operations. Drinking water is thought to be the most significant exposure route to zinc at hazardous waste sites.

Zinc appears to be toxic only at levels at least 10 times higher than the recommended daily allowance. Symptoms of overexposure may include severe diarrhea, stomach cramping, nausea, and vomiting. Serious damage to the digestive system can occur if too much zinc is ingested over a long period of time. Ingesting excess amounts of zinc can cause deficiency in other nutrients such as iron (anemia) and copper. Anemia is the critical, or most sensitive, effect caused by zinc overexposure. Inhalation of zinc fumes or dusts has been associated with a condition called "metal fume fever" characterized by flu-like symptoms including throat irritation, body aches, weakness, and fatigue. Zinc is not thought to cause cancer or birth defects.

The oral RfD for zinc, 3E-01 mg/kg-day, is based on decreased blood enzymes in 10-week-old infants who were given zinc as a dietary supplement.

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RBSCs for COPCs, HQs were calculated. These HQs were used in a weight-of-evidence approach in the Phase II ERA to assess potential ecological risks associated with surface soil contamination on the undeveloped landfill. Potential risks to ecological receptors estimated during this phase were used in the Phase II ERA to assist in determining the COPCs that present the greatest threat of adverse effects.

U.2.1.3 Statutory and Regulatory Background

The statutory and regulatory background of the ASL site is provided in Section 1 of the RRII report.

U.2.1.4 Technical Guidance

The major tasks of both phases of the ERA were completed following EPA technical guidance including: *Framework for Ecological Risk Assessment* (EPA 1992a); *Developing a Work Scope for Ecological Assessments* (EPA 1992b); *Ecological Assessment of Superfund Sites: An Overview* (EPA 1991a), and other pertinent guidance. The major tasks of the ERA included:

- Problem Formulation (Section U.2.2);
- Analysis (Section U.2.3); and
- Risk Characterization (Section U.2.4).

U.2.2 PROBLEM FORMULATION

Problem formulation establishes the goals, breadth, and focus of the risk assessment (EPA 1992a). First, the physical site description and a summary of previous ecological investigations are studied to provide an understanding of the site setting and the COPCs that might pose ecological risks. Several integrated steps follow, in which potential COPCs, potential receptors, potential exposure pathways, summaries of potential ecological effects, and toxicity mechanisms are identified. One or more assessment endpoints are selected to represent the environmental values to be protected at the site. Measurement species and

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endpoints are then selected that relate the potential adverse effects of the site-related COPCs to the assessment endpoints.

The problem formulation phase concludes with the development of a focused ecological conceptual site model. In this model, hypotheses are developed that describe and delineate the relationships between site-associated COPCs and measurement species to be investigated during the analysis (Section U.2.3) and risk characterization (Section U.2.4) phases of the ERA. The problem formulation phase is summarized on Figure U-1.

Some information necessary for problem formulation has been presented in previous sections and will be incorporated by reference.

U.2.2.1 Site Description

The location, a detailed description, and the history of the site are provided in the Site Description and Site History subsections (Section 1) of the RRII report.

U.2.2.2 Previous Studies of Site-Related Stressors

Several investigations of surface and subsurface soil have been conducted at the site. A complete chronological summary of these environmental studies is presented in the Summary of Previous Investigations section of the RRII report (Section 1). The principal site-related COPCs in surface soil noted during earlier investigations include arsenic, cadmium, lead, mercury, zinc, and polycyclic aromatic hydrocarbons (PAHs).

U.2.2.3 Identification of Potential Stressors of Ecological Concern

This section presents the procedure for the selection of stressors most likely to be associated with ecological risks at the site. The term "stressor" refers to any chemical, physical, or biological entity that can induce adverse effects on individuals, communities, populations, or ecosystems (EPA 1992a). For this ERA, stressor refers to chemical contaminants in environmental media. At the ASL site, major stressors of potential ecological concern (SOPCs) are organic and inorganic wastes generated by historical operations at the landfill. Remedial activities could also cause physical disturbance of habitats, which could result in more harm to the environment than if chemical SOPCs were left in place. Conse-

quently, the potential ecological impacts of remedial actions should be considered in risk management decisions.

Site-Related Chemical Stressors of Potential Ecological Concern

This section identifies site-related chemical SOPCs that were evaluated in the Phase I ERA. Selection of SOPCs for an ERA generally involves the following steps:

- Initial data quality review;
- Review of the spatial distribution of sampling sites;
- Evaluation of the frequency of detection (FOD) and range of concentrations; and
- Comparisons of chemical concentrations with natural background and risk-based criteria or benchmarks.

However, for the Phase I ERA, selection of SOPCs was based solely on the initial data quality review of the ESI data set because only four surface soil samples were collected from the undeveloped landfill (see Figure U-2). These four sample locations were biased toward areas of suspected contamination; sampling was not systematic. Therefore, the ESI data set was considered inadequate for characterizing the spatial extent of potential ecological risks. Also, estimated exposure of terrestrial wildlife to SOPCs utilizing these four surface soil samples would not be representative of the average exposure scenario. In addition, identifying potential SOPCs based on FOD screening is inappropriate for a data set of less than 20 samples.

Comparisons of chemical concentrations with natural background concentrations were not performed during this phase in order to generate a larger list of SOPCs for the undeveloped landfill. This larger list of SOPCs was designed to provide a larger list of RBSCs for comparison with RRII surface soil data in Phase II. Risk-based screening of soils was not performed in the Phase I ERA because site-specific RBSCs for the undeveloped landfill had not previously been developed. In addition, there are no currently existing RBSCs that are protective of all potentially exposed terrestrial wildlife. Therefore, all SOPCs that were

retained following the initial data quality review were evaluated in the Phase I ERA. The SOPC selection process for the Phase I ERA is outlined in Figure U-3.

Initial Data Quality Review. An initial data quality review was conducted to locate, assemble, and determine the useability of available site data for the Phase I ERA. Data were categorized by type of chemical stressor (organic or inorganic) and sorted by depth intervals (0 to 24 inches and greater than 24 inches). However, only soil data collected from the 0- to 24-inch (surface soil) interval were evaluated for the ERA because the majority of exposure to terrestrial wildlife is assumed to occur within this soil horizon. Although some terrestrial wildlife may inhabit areas below this soil horizon, for this ERA the 0- to 24-inch depth interval was assumed to represent the entire exposure of wildlife to SOPCs. Quality assurance (QA)/quality control (QC) information was evaluated and used to assess data useability and interpret data qualifiers. Table V-1 presents ESI undeveloped landfill surface soil concentrations, data qualifiers and their definitions.

Chemicals were excluded from further evaluation if the substance was an artifact of sampling or analysis, as determined by comparison with method and field blanks ("JB" or "UJB" qualifiers for organic stressors). Common laboratory contaminants detected at concentrations 10 times or less than the maximum concentrations reported in any method or field blank were excluded as well. Common laboratory contaminants include acetone, methylene chloride, 2-butanone (methyl ethyl ketone), toluene, and phthalate esters. Other chemicals detected at five times or less than the maximum blank concentrations were also considered artifacts of sampling and analysis and were eliminated. Any result qualified with only a "B" was excluded from further analysis because it was detected at concentrations less than 10 times the maximum blank concentration for common laboratory contaminants, and less than five times the maximum blank concentration for other contaminants.

If the qualifier indicated that the organic or inorganic analyte was not detected ("U", "UD", "UJ", and "UJB" qualifiers), one half of the detection limit was used. Data were excluded if the qualifier indicated that the data should be rejected ("R" qualifier). This qualifier indicated difficulties in the analytical procedures other than blank contamination, which disallowed accurate results.

Chemical concentrations qualified as estimated values ("J", "JD", or "JKL" qualifiers) were included in the evaluation. Estimated values resulted when the detected concentration of a stressor was below the quantitation limit but above the detection limit of the instrument, or when criteria associated with analytical methods were not achieved. All data not excluded during the initial data quality review were included for evaluation in the Phase I ERA.

Summary of Chemical Stressors of Potential Ecological Concern. This section presents the screening results for SOPCs detected in ESI surface soil data collected from the undeveloped landfill. Table V-2 presents the 58 volatile, semivolatile, and inorganic soil SOPCs included in the Phase I ERA after screening procedures. PAHs and pesticides represented 64% of the organic SOPCs detected in undeveloped landfill surface soil.

A total of 22 inorganic soil SOPCs were included in the Phase I ERA. Concentrations greater than 1,000 mg/kg were observed for aluminum, barium, copper, iron, lead, and zinc. Calcium, magnesium, and potassium were eliminated from further evaluation in the Phase I ERA because they are considered essential nutrients for wildlife.

U.2.2.4 Ecosystem Components

This section presents the ecological setting of the undeveloped landfill. In order to focus the ERA on the most significant ecological components of the site, important aspects of regional, local, and site-specific ecology were evaluated. The description of the ecological setting includes a discussion of the habitats and species of concern. The presence of legally protected, threatened, endangered, sensitive, or rare species is also discussed and their potential for exposure at the site is evaluated.

Regional and Local Ecology

General background information on the topography, geology, hydrogeology, and meteorological conditions of the site and surrounding areas is presented in Section 1 of the RRII report.

Ecology of the Undeveloped Landfill

The undeveloped landfill was qualitatively surveyed by E & E ecologists in April 1994. During this reconnaissance survey, habitat maps and species lists were generated for use in the ERA. Approximately 15% of the undeveloped landfill area was covered with debris, consisting mainly of tires, scrap metal, construction rubble, and empty gas tanks. Several concrete foundations and an abandoned building were observed on the west-central portion of the undeveloped landfill. The concrete foundations were nearly covered with secondary successional herbaceous growth.

Surface soil on the undeveloped landfill is likely a mixture of natural soil, fill material, and debris associated with current and historical activities at the site. If natural conditions were assumed at the site, the predominant soil type would consist of Harahan soils (USDA 1989). Harahan soils are poorly drained and have a low permeability coefficient. In general, this soil type is characterized by the following physical and chemical properties: pH of 5.1 to 7.3, permeability of less than 0.06 in/hr, and a significant amount (2% to 25%) of organic matter (USDA 1989). These properties have likely been influenced by the addition of fill material and debris but were used to assess potential transport and fate (see Section U.2.2.5.2) of SOPCs in soils for this ERA.

The undeveloped landfill is dominated by primary and secondary successional plant species which are characteristic of recently disturbed areas. The vegetative cover is approximately 80% overstory (mature trees), 40% understory (saplings and shrubs), and 60% herbaceous layer (grasses and forbes). Dominant plant species within these three groups are:

- Overstory: White ash (*Fraxinus americana*), red mulberry (*Morus rubra*), and weeping willow (*Salix babylonica*);
- Understory: Saplings of dominant overstory species and shrubs such as chinaberry, honewort, and raspberries; and
- Herbaceous: Cow vetch, cleavers (*G. aperine*), and virginia creeper.

Ground cover is composed primarily of heavy leaf litter. Table V-3 is a list of plant species observed on-site and those species that potentially inhabit the site.

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Wildlife observed on the undeveloped landfill include species of mammals, birds, and reptiles. The most frequently observed mammalian species on-site was the eastern cottontail (*Sylvilagus floridanus*). However, other small mammals such as mice (*Peromyscus spp.*), shrews (*Sorex spp.*), and rats (*Neotoma and Sigmodon spp.*) are likely to inhabit the site as well. Because the site is situated in an urban area, the occurrence of larger mammals (e.g., deer) is unlikely. Table V-4 presents a list of mammalian species observed on-site, and species that potentially inhabit the site.

Many bird species potentially inhabit the site. Species observed on-site during the reconnaissance survey include the great blue heron (*Ardea herodias*), American crow (*Corvus brachyrhynchos*), brown thrasher (*Toxostroma rufum*), chipping sparrow (*Spizella passerina*), cardinal (*Cardinalis cardinalis*), and blue jay (*Cyanocitta cristata*). There was evidence of crows nesting on site. Several raptors were also observed flying over the site; however, species and their potential utilization of the site were not determined. Raptor species tentatively identified by other E & E field personnel include the red-tailed hawk (*Buteo jamaicensis*), red-shoulder hawk (*Buteo lineatus*), Mississippi kite (*Ictinia mississipiensis*), and American kestrel (*Falco sparverius*) (E & E 1994). Table V-5 presents a list of avian species observed on-site and species that potentially inhabit the site.

Three species of reptile were observed on the undeveloped landfill, including ground skink (*Scincella lateralis*), green anole (*Anolis carolinensis*), and snake. The ground skink and green anole were the species observed in the greatest numbers at the site. A positive identification of the snake could not be made.

Based on observations made during the reconnaissance survey, it is likely that a diverse terrestrial invertebrate community exists at the site. Insect species observed include butterfly, dragonfly, mosquito, glossy pillbug (*Geotrupes splendidus*), and wolf spider (*Pardosa spp.*). These and other invertebrate species potentially inhabiting the site may play important roles in nutrient cycling and food chain transfer.

The Florida Avenue Canal and Peoples Avenue Canal, which run parallel to the southern and western borders of the site, respectively, potentially play a significant role in the ecology of the ASL site. These canals were not sampled during the ESI but are addressed in the Phase II ERA.

Threatened, Endangered, Sensitive, or Rare Species

In Louisiana, rare, threatened, endangered or sensitive plant and animal species may be categorized by federal or state agencies such as the United States Fish and Wildlife Service (USFWS) and the Louisiana Department of Wildlife and Fisheries (LADWF). USFWS maintains a general list of threatened and endangered plant and animal species in Louisiana. Table V-6 provides a list of the federal and state regulated species found in the vicinity of the site.

A Natural Heritage Program database search was conducted by LADWF to identify rare, threatened, endangered, or sensitive plant and animal species that inhabit the New Orleans East topographic quadrangle where the site is located (USGS 1994). Species identified in this search include Mississippi diamondback terrapin (*Malaclemys terrapin*), big brown bat (*Eptesicus fuscus*), and pallid sturgeon (*Scaphirhynchus albus*) (LADWF 1994). To evaluate the potential for these species to inhabit the site, the database was further searched to determine the specific locations of each species by identifying their latitude and longitude coordinates within this quadrangle. The coordinates for each species are listed below.

- Mississippi Diamondback Terrapin (*Malaclemys terrapin*): 29°57'20"; 90°03'07";
- Big Brown Bat (*Eptesicus fuscus*): 29°58'10";90°03'22"; and
- Pallid Sturgeon (*Scaphirhynchus albus*): 29°55'52"; 90°03'32"

Based on the coordinates listed above, and latitude and longitude coordinates for the site (Section 2 of the RRII report), these species are not expected to be found on the undeveloped landfill.

Wetlands Survey

A survey of potential wetland habitats was conducted on the undeveloped landfill during the reconnaissance survey. No obligate wetland species were observed. While several

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depressions were observed with small amounts of standing water, the vegetation in these areas was not characteristic of wetland vegetation.

In addition to the reconnaissance survey, the Wetlands Inventory Map for the New Orleans East quadrangle was analyzed; no evidence of wetlands was identified within the vicinity of the site (USFWS 1994). Therefore, it was concluded that there are no wetland habitats on the undeveloped landfill.

U.2.2.5 Potential Pathways of Stressor Migration and Exposure

This section presents the potential migration pathways and fate of SOPCs in the natural environment and the associated exposure pathways for flora and fauna on the undeveloped landfill. Those pathways that represent the greatest potential for exposure were selected for examination in the ERA.

Numerous organic and inorganic contaminants are present on the undeveloped landfill because of past burning of refuse and spreading of the resulting ash, as well as debris disposal. These contaminants may migrate through surface soil and/or the terrestrial food chain. Figure U-4 shows the potential pathways of contaminant migration and receptor exposure routes. Several ecologically relevant migration pathways for SOPCs potentially exist at the site, namely:

- Erosion and surface water runoff of contaminated surface soils;
- Migration of SOPCs from site surface soil to groundwater; and
- Bioaccumulation/biomagnification of surface soil SOPCs through the terrestrial food chain.

The following is a discussion of the major pathways of contaminant migration and exposure for the undeveloped landfill. Surface soil and the terrestrial food chain are the principal exposure pathways of ecological concern in this phase of the ERA. Direct contact may be another significant exposure pathway for biota; however, this pathway was not considered because exposure modeling parameters are not available to adequately assess exposure.

U.2.2.5.1 Undeveloped Landfill

The potential transport pathways for SOPCs on the undeveloped landfill are volatilization, wind erosion, leaching and infiltration to groundwater, surface water runoff, and biota translocation. Volatilization is not expected to be a major transport pathway because volatile organic compounds (VOCs) were not detected at high concentrations (< 3.0 mg/kg) in the surface soils. Wind erosion is not expected to be significant because of the dense vegetation on the undeveloped landfill.

Heavy rainshowers are common in southeastern Louisiana and may result in large amounts of runoff at the site. This runoff may carry SOPCs to other areas of the landfill. However, surface water runoff from the site to the canals is unlikely due to the railroad right-of-ways between the site and the canals.

Leaching and infiltration of SOPCs through soil to groundwater is unlikely for many of the SOPCs because the site soils are relatively impermeable (permeability < 0.06 in/hr) (USDA 1989) and have high organic content (potentially up to 25%). However, debris has been buried to depths of 20 feet in several areas throughout the undeveloped landfill. Depth to groundwater is approximately 7 feet at the site; therefore, there are assumed to be areas at which site-groundwater directly contacts landfill debris. Potential contamination of surface water and sediment within the Florida Avenue Canal and Peoples Avenue Canal from groundwater transport of SOPCs will be considered in the Phase II ERA.

Biota translocation of surface soil SOPCs on the undeveloped landfill is expected to be a significant transport pathway due to the relatively high concentrations of several inorganic SOPCs detected in ESI surface soil samples (> 1,000 mg/kg).

U.2.2.5.2 Transport and Fate of Site-Related Stressors in Environmental Media

This section presents a qualitative evaluation of the fate of selected SOPCs in surface soil and the potential for bioaccumulation and/or biomagnification through the terrestrial food chain. SOPCs from two major organic analyte classes (chlorinated pesticides and PAHs), and several inorganic SOPCs with high frequencies of detection and high concentrations were selected from Table V-2 for evaluation in this section. These SOPCs are assumed to be representative of other SOPCs from each analyte class detected in the ESI data set which

possess similar physicochemical properties. Table V-7 presents a summary of transport and fate characteristics for SOPCs selected in this section. Table V-8 presents a summary of log K_{ow}s for SOPCs selected in this section.

Fate of 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE in Environmental Media

This section presents the fate of 4,4'-DDT and its metabolites (DDTR) in site surface soil and their potential for bioaccumulation and/or biomagnification in the terrestrial food chain. DDTR is very persistent in soils. Organic carbon partition coefficients (K_{oc}) for DDT, DDE, and DDD are 2.4×10^5, 4.4×10^6, and 7.7×10^5, respectively, indicating extensive adsorption to soil particles (ATSDR 1992a). These compounds are only slightly water soluble. Therefore, transport over land would most likely occur while bound to soil particles, either by wind erosion or surface water runoff. Their high affinity for soils and low water solubility decrease the potential for vertical migration through the soil to groundwater.

Volatilization of DDT and DDE accounts for considerable losses from surface soil (ATSDR 1993a). DDD's potential for volatilization is approximately three times less than that of DDT or DDE. Because DDD and DDE are breakdown products of DDT, these two metabolites are expected to be the most common metabolites in the undeveloped landfill surface soil.

Decreased availability of DDT due to adsorption to organic matter and photo-oxidation may also occur. These processes, coupled with volatilization and surface water runoff, potentially account for most of the losses of DDTR from soils.

Based on the relative impermeability and high organic content of undeveloped landfill surface soil, and the sorptive nature of DDTR, it is expected that DDTR will be retained in the upper surface soil horizons and will not migrate vertically. Surface water runoff may transport DDTR in soil short distances, but due to the topography (many areas below sea level) and the extensive vegetative cover on the undeveloped landfill, transport of DDTR off-site is unlikely.

DDTR is bioaccumulated and biomagnified in the terrestrial food chain (ATSDR 1993a). A wide variety of animals have been found to contain DDTR even though the areas they inhabit were not known to have been sprayed with the pesticide. Biomagnification

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potential is greatly increased because DDTR is absorbed into fatty tissue and is not readily metabolized. Exposure of terrestrial wildlife to DDTR on the undeveloped landfill is likely to occur through direct contact with and ingestion of contaminated soil, and ingestion of vegetation or animal prey by soil invertebrates, herbivores, omnivores, and carnivores, respectively.

Fate of PAHs in Environmental Media

This section presents the fate of PAHs in site surface soil and their potential for bioaccumulation and/or biomagnification in the terrestrial food chain. Transport and fate of PAHs in the environment are determined to a large extent by their individual physical and chemical properties. PAHs of different molecular weight vary substantially in their behavior and distribution in the environment. Low molecular weight PAHs (152 to 178 g/mol) include acenaphthene, acenaphthylene, anthracene, fluorene, and phenanthrene. Medium molecular weight PAHs (202 g/mol) include fluoranthene and pyrene. High molecular weight PAHs (228 to 278 g/mol) include benzo(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.

In soil, the fate of PAHs is dependent upon organic carbon content and particle size (ATSDR 1990a). Sorption of PAHs to soil particles increases with increasing organic carbon content. Low and medium molecular weight PAHs have a moderate potential to be adsorbed to soil. Therefore, low and medium molecular weight PAHs are more likely to be transported through soils by partitioning and leaching.

Volatilization of PAHs from soil may also occur. Volatilization of low molecular weight PAHs may be substantial; however, volatilization does not appear to be an important transport mechanism for higher molecular weight PAHs (ATSDR 1990a). This pathway is expected to be less significant than overland transport.

The degradation of most PAHs is not completely understood. PAHs in soil may either accumulate to relatively high levels in soil, assimilate in plants, or degrade due to soil microorganism action. Microbial metabolism is the major degradation process for PAHs in soils. Biodegradation is affected by environmental inputs, characteristics of the microbial

population, and the physical and chemical properties of the PAHs. Environmental inputs that may affect the rate of biodegradation include: temperature, pH, dissolved oxygen, PAH concentrations, soil type, moisture content, nutrients, and other substances that may act as substrate co-metabolites. The size and composition of microbial populations are also affected by these factors. Sorption of PAHs to organic matter and soil particles also influences bioavailability and, hence, metabolism (ATSDR 1990a). The rate of biodegradation is also altered by the presence of other SOPCs that may be toxic to biodegrading microorganisms.

All but one (benzo(j)fluoranthene) of the low, medium, and high molecular weight PAHs identified in this section were detected during the ESI in undeveloped landfill surface soil. Based on the expected high organic content of undeveloped landfill surface soil, and the sorptive nature and low volatilization potential of the high molecular weight PAHs, it is expected that these PAHs will be retained in the upper surface soil horizons and will not migrate laterally or vertically. Low and medium molecular weight PAHs, however, may either remain in the upper surface soil horizons or migrate vertically to groundwater.

PAHs may accumulate in the terrestrial food chain but biomagnification is not expected. In general, bioaccumulation is greater for the higher molecular weight compounds than for the lower molecular weight compounds. Unsubstituted PAHs do not accumulate in mammalian adipose tissues despite their high lipid solubility because they are quickly metabolized (Eisler 1987a).

Plants and vegetables can absorb PAHs from soils through their root systems or directly through leaf surfaces (ATSDR 1990a). Uptake rates are governed by concentration, water solubility, soil type, physicochemical state (vapor or particulate), particle size, plant species, and molecular weight (ATSDR 1990a; Eisler 1987a). Lower molecular weight PAHs are more readily absorbed than higher molecular weight PAHs (Eisler 1987a). Therefore, low molecular weight PAHs would have a greater potential to be mobilized in the terrestrial food chain.

PAHs, once assimilated by vegetation, may either be translocated, metabolized, or possibly photodegraded within the plant. For some plants growing in highly contaminated areas, assimilation may exceed metabolism and degradation, resulting in an accumulation in plant tissues (Eisler 1987a). Ratios of PAH concentrations in vegetation to those in soil range

from 0.001 to 0.18 for total PAHs and from 0.002 to 0.33 for benzo(a)pyrene. However, atmospheric deposition of PAHs on plant surfaces appears to greatly exceed uptake from soil as a route of PAH accumulation (ATSDR 1990a).

Potential exposure of terrestrial wildlife to PAHs on the undeveloped landfill is likely to occur through the ingestion of surface soil. Uptake of PAHs by terrestrial vegetation is possible and will be assessed in the exposure model. Food-chain transfer of PAHs to higher trophic levels is unlikely due to the high rate of PAH metabolism in mammals and birds.

Fate of Arsenic in Environmental Media

This section presents the fate of arsenic in site surface soil and its potential for bioaccumulation and/or biomagnification in the terrestrial food chain. Many arsenic compounds tend to adsorb to clays, iron oxides, aluminum hydroxides, manganese compounds, and organic materials in soils. Consequently, migration of arsenic through soil via leaching is not expected to be widespread and usually results in relatively short transportation distances. Based on the expected high organic content of undeveloped landfill surface soil and the sorptive nature of arsenic, it is expected that arsenic will be retained in the upper surface soil horizons and will not migrate laterally or vertically.

Arsenic accumulates in the terrestrial food chain but is not usually biomagnified (ATSDR 1993b). Terrestrial plants have the potential to accumulate arsenic through root uptake from soil or absorption of airborne arsenic deposited on the leaves (ATSDR 1993b). Potential exposure of terrestrial wildlife to arsenic on the undeveloped landfill is likely to occur through ingestion of soil and vegetation. Significant exposure to higher terrestrial food chain species is unlikely because it is not usually biomagnified.

Fate of Cadmium in Environmental Media

This section presents the fate of cadmium in site surface soil and its potential for bioaccumulation and/or biomagnification in the terrestrial food chain. Cadmium may exist in soil as both ionic and covalent species and may be bound to soils through cationic exchange (ATSDR 1993c). Cadmium-containing soil particles may be transported via wind or surface water runoff. Under acidic conditions, cadmium may also leach through soils (ATSDR

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1993c). Important factors affecting cadmium movement in soil include cation exchange capacity (CEC), pH, content of clay minerals, carbonate minerals, oxides, organic matter, and dissolved oxygen (ATSDR 1993c). Given the pH of Harahan soils (5.1 to 7.3), cadmium has the potential to migrate vertically to groundwater. However, due to the topography and the extensive vegetative cover on the undeveloped landfill, overland transport of cadmium is unlikely.

Studies indicate that cadmium may bioaccumulate in all levels of the terrestrial food chain, but biomagnification usually occurs only in the lower trophic levels (ATSDR 1993c). This may be because bioaccumulation occurs primarily in the liver and kidneys where it is biodegraded and/or eliminated from the body (ATSDR 1993c). The following trends have been observed regarding the concentrations of cadmium in terrestrial biota: cadmium concentrations are generally higher in older organisms than in younger ones (especially pronounced in carnivores), and cadmium concentrations are higher in animals within industrialized and urbanized areas (Eisler 1985a).

Since cadmium may accumulate in all levels of the terrestrial food chain, potential exposure of terrestrial wildlife to cadmium on the undeveloped landfill is likely to occur through uptake by plants from soils and ingestion of contaminated soil, vegetation, or animal prey by soil invertebrates, herbivores, omnivores, and carnivores, respectively.

Fate of Lead in Environmental Media

This section presents the fate of lead in site surface soil and its potential for bioaccumulation and/or biomagnification in the terrestrial food chain. In soil, lead strongly complexes to organic materials and adsorbs to inorganic solids. The mobility of lead in soil is affected by soil type, pH, organic carbon content, CEC, the form of lead (e.g., free ion or hydroxide complex), and the presence of metal oxides, aluminum silicates, and carbonates. Generally, the mobility of lead is naturally low, especially in clay and silty clay soils. The potential for mobility increases with decreasing pH and CEC, and in sandy, loamy sand, and sandy loam soils (ATSDR 1992a, Eisler 1988a).

Downward movement of lead from soil via leaching is very slow under most natural conditions. Conditions that induce leaching are the presence of lead in soil at concentrations

that either approach or exceed the CEC of the soil, the presence of materials in soil that are capable of forming soluble chelates with lead, and a decrease in the pH of the leaching solution. In soil with a high organic matter content and a pH of 6 to 8, lead may form insoluble organic lead complexes; if the soil has less organic matter at the same pH, hydrous lead oxide complexes may form or lead may precipitate with carbonate or phosphate ions. At a pH of 4 to 6, the organic lead complexes become soluble and may leach out or be taken up by plants (ATSDR 1992a).

Although the organic content of the soils on the undeveloped landfill is expected to be high, there is potential for organic lead complexes to become soluble and migrate laterally or vertically in surface soil due to the pH of Harahan soils (5.1 to 7.3). Overland migration of lead, however, is not likely due to the topography of the undeveloped portion of the landfill and the extensive vegetative cover.

Plants and animals may bioaccumulate lead, but biomagnification has not been observed (ATSDR 1992a). In general, the highest lead concentrations are found in terrestrial organisms in the proximity of lead mining, smelting, and refining facilities; storage battery recycling plants; areas affected by high automobile and truck traffic; sewage sludge and spoil disposal areas; sites where dredging has occurred; areas of heavy hunting (lead source from spent shot); and in urban and industrial areas. Older organisms tend to contain the greatest concentrations of lead because lead can concentrate in the skeletal systems of these organisms over time.

Potential exposure of terrestrial wildlife to lead on the undeveloped landfill is likely to occur through ingestion of vegetation and soil. Potential exposure to higher terrestrial food chain species is unlikely because lead is not typically biomagnified.

Fate of Mercury in Environmental Media

This section presents the fate of mercury in site surface soil and its potential for bioaccumulation and/or biomagnification in the terrestrial food chain. The fate of mercury in soil is largely dependent on the total organic content and pH of the soil. Elemental mercury is highly volatile and diffuses rapidly through soil pores to the atmosphere, while mercury compounds are more likely to partition to particulates in the soil. Strong sorption to soil

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particulates has been demonstrated in humic materials, and strongly bound sesquioxides form in soil at a pH above 4. For example, mercury has been shown to be highly sorbent to peat and to lathyritic soil to a maximum loading capacity of 15 g/kg (ATSDR 1992b). Adsorption of mercury in soil decreases with increasing pH and/or chloride ion concentrations. Leaching is a relatively insignificant transport process in soils, but erosion due to runoff from soils can be important, particularly from soils with high humic content. Given the pH of Harahan soils (5.1 to 7.3) and the high organic content, it is expected that mercury will be retained in the upper surface soil horizons and will not migrate vertically to groundwater. Surface water runoff should also be minimal due to the topography and vegetative cover on the undeveloped landfill.

Bioaccumulation and biomagnification of mercury have been demonstrated in the terrestrial food chain. Levels of mercury in carnivorous mammals are higher than those in herbivores (Eisler 1987b). Herbivores such as mule deer, moose, caribou, and rabbits have shown levels less than 1.0 mg/kg fresh weight in liver and kidneys, while carnivores such as martens, polecats, and red foxes have contained over 30 mg/kg fresh weight of mercury.

Although mercury concentrations in roots have been shown to be elevated, virtually no uptake of mercury by the shoots of plants such as peas has been demonstrated. There appears to be a root barrier to translocation of mercury to plant tops (HSDB 1994).

Because mercury is not taken up in significant amounts by most terrestrial vegetation, potential exposure of terrestrial wildlife to mercury on the undeveloped landfill is likely to occur only through the ingestion of soil. If mercury enters the terrestrial food chain via soil ingestion, it has the potential to be biomagnified by higher food chain receptors.

Fate of Zinc in Environmental Media

This section presents the fate of zinc in site surface soil and its potential for bioaccumulation and/or biomagnification in the terrestrial food chain. Ambient soil concentrations of zinc range from 10 to 300 mg/kg, with a mean of approximately 50 mg/kg (ATSDR 1992c). Zinc adsorbs strongly to soils. Mobilization in soil depends on the water solubility of the speciated forms of the compound, as well as soil CEC, pH, redox potential (Eh), and the form of zinc present in the soil (ATSDR 1992c).

At a pH below 7, pH and the amount of zinc in solution are negatively linearly related; decreased pH results in increased solubility, and thus, increased potential for mobility. Low soil CEC, and oxidizing conditions also increase the mobility of zinc. As pH increases over 7, solubility decreases and zinc absorption to soil increases.

Soluble forms of zinc, such as zinc sulfate, are fairly mobile in most soils. This form of zinc is relatively uncommon in soils, however, and its dissolution is slow. Given the pH of Harahan soils (5.1 to 7.3) and the potentially high organic content of undeveloped landfill surface soil, some zinc will be retained in the upper surface soil horizons while some may migrate via leaching and surface water runoff.

Plants and animals may bioaccumulate zinc, but biomagnification has not been observed (ATSDR 1992c). Bioaccumulation factors between soil and terrestrial plants, invertebrates, and mammals are 0.4, 8, and 0.6, respectively (ATSDR 1992c). Therefore, potential exposure of terrestrial wildlife to zinc on the undeveloped landfill is likely to occur through ingestion of vegetation, soil, and soil macroinvertebrates. Potential exposure to higher terrestrial food chain species is unlikely because zinc is not biomagnified.

Summary of Potential Transport and Exposure Pathways of Stressors of Potential Concern

Based on this qualitative evaluation, it appears that transport of SOPCs overland via erosion or surface water runoff to off-site areas is an insignificant transport pathway on the undeveloped landfill due mainly to the topography of the site. Vertical migration through soil to groundwater by several SOPCs is possible but is generally not expected due to the high organic carbon content and pH of surface soil on the undeveloped landfill and the highly sorptive nature of many of the SOPCs evaluated. Based on these site and SOPC-specific characteristics, exposure of terrestrial biota to SOPCs on the undeveloped landfill will most likely occur through the ingestion of soil, soil macroinvertebrates, and vegetation found at the site. Biomagnification of SOPCs in the terrestrial food chain may occur for several SOPCs, but bioaccumulation in lower trophic level species is expected to be the primary fate of the majority of surface soil SOPCs at the site.

U.2.2.6 Identification of Known Ecological Effects of Site-Related Stressors

Available toxicological literature was qualitatively reviewed to determine potential ecological effects and mechanisms of toxicity of SOPCs on several classes of wildlife (mammals, birds, and plants). This review was pertinent to endpoint selection (Section U.2.2.7.3), development of the focused ecological conceptual site model (Section U.2.2.8), and selection of appropriate toxicity benchmark values (TBVs) in the ecological effects assessment (Section U.2.3.2). Potential effects of exposure to SOPCs are dependent upon a number of factors including dosage, species, age, and gender of the test organism. Therefore, potential ecological effects of SOPCs on undeveloped landfill species presented in this section do not necessarily represent realized effects. The following summaries provide qualitative toxicological reviews of SOPCs discussed in Section U.2.2.5. At least one SOPC was chosen from each of the analyte classes detected in ESI undeveloped landfill surface soil samples. These SOPCs were selected to express the broad range of toxicological responses that might be possible, given the extensive list of SOPCs in undeveloped landfill surface soil.

U.2.2.6.1 Toxic Effects of DDT, DDE, and DDD To Wildlife

DDT and its metabolites (DDTR) elicit a variety of effects on many wildlife species. The liver appears to be one of the primary targets of DDTR toxicity. Mild to severe hepatic effects in animals occur as a result of acute, subchronic, or chronic oral exposure to DDTR. Oral exposure to DDTR also elicits reproductive and nervous system toxicity at these exposure durations.

A major environmental problem has resulted from the specific effects of DDTR on eggshell formation in raptorial birds. Accumulation of DDTR causes decreases in eggshell thickness of 10% to 15%, resulting in widespread breakage (HSDB 1994). Eggshell thinning by DDTR has been observed in several species, including herring gulls and American kestrels (HSDB 1994).

U.2.2.6.2 Toxic Effects of PAHs to Wildlife

A number of PAH-caused effects have been observed in a variety of species under laboratory conditions, including effects on survival, growth, and metabolism (Eisler 1987a).

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The lower-molecular-weight unsubstituted PAH compounds containing two to three aromatic rings such as naphthalenes, fluorenes, phenanthrenes, and anthracenes have significant acute toxicity to some organisms, whereas the higher molecular weight four- to seven-ring aromatics are not as acutely toxic (Eisler 1987a). There is a scarcity of data available on the toxicological properties of PAHs which are not demonstrably carcinogenic to mammals (Eisler 1987a). However, the available data suggest that PAHs are absorbed readily into biological tissues due to their lipophilicity. Once absorbed, they may be distributed throughout the body via the bloodstream, but rarely bioaccumulate or biomagnify due to their rapid biodegradation.

Noncarcinogenic mechanisms of toxicity for PAHs are not well documented. In chronic exposure scenarios, the liver, respiratory system, nervous system, reproductive system, and fetal development have all been affected. It can be assumed that PAHs and/or their multiple breakdown products (arene oxides, phenols, quinones, dihydrodiols, sulfate esters, diol epoxides, etc.) interfere with numerous essential biochemical functions in the affected areas.

U.2.2.6.3 Toxic Effects of Arsenic to Wildlife

Arsenic is nutritionally beneficial and essential to wildlife at relatively low concentrations. Mammals fed less than 0.05 mg/kg arsenic showed poor growth, reduced survival, and inhibited reproduction, while those fed diets of 0.35 mg/kg arsenic showed no effects (Eisler 1988b). Arsenic can cross placental boundaries causing death and malformation of fetuses and mutagenic effects on offspring of certain animal species. Arsines are the most toxic forms of arsenic, followed by inorganic arsenites, organic trivalent compounds, inorganic arsenates, organic pentavalent compounds, arsonium compounds, and elemental arsenic (Eisler 1988b).

In mammals, acute arsenic poisoning is characterized by high mortality and morbidity. Death is preceded by staggering gait, extreme weakness, trembling, salivation, vomiting, diarrhea, prostration, and collapse. Subacute symptoms include anorexia, increased urination, dehydration, trembling, stupor, hearing loss, blindness, and subnormal body temperatures. Chronic arsenic poisoning is rarely seen in most animals because detoxification and excretion

are rapid, but symptoms include paralysis, conjunctivitis, dermatitis, decreased growth, and liver damage (Eisler 1988b).

In birds, effects of inorganic trivalent arsenite poisoning include muscular incoordination, debility, slowness, jerkiness, falling, hyperactivity, piloerection (fluffed feathers), drooped eyelids, immobility, and seizures. These effects are due to the destruction of blood vessels lining the gut, which also result in decreased blood pressure and shock. However, northern bobwhites, mockingbirds, American robins, and other songbirds fed grasshoppers that had been poisoned by arsenic trioxide (40 mg/kg arsenic) showed no deleterious effects. The most sensitive species of birds tested were brown-headed cowbirds, California quail, chicken, and turkey (Eisler 1988b).

U.2.2.6.4 Toxic Effects of Cadmium to Wildlife

Cadmium is a known teratogen, a probable mutagen, and has been implicated as the cause of severe deleterious effects in wildlife (Eisler 1985a). Teratogenic effects of cadmium appear to be greater than those for other metals. It is conservatively estimated that adverse effects on wildlife are either pronounced or probable when cadmium concentrations exceed 0.1 mg/kg in the diet (Eisler 1985a).

Mammals and birds are comparatively resistent to lethal effects of cadmium. Sublethal effects of cadmium in birds (similar to those seen in other animals) include growth retardation, anemia, and testicular damage (Eisler 1985a). The addition of zinc, iron, ascorbic acid, calcium, or selenium to diets inhibits cadmium's adverse effects (Eisler 1985a).

U.2.2.6.5 Toxic Effects of Lead to Wildlife

Lead adversely affects survival, growth, reproduction, development, and metabolism of most species under controlled conditions, but its effects are substantially modified by numerous physical, chemical, and biological variables. Uptake of lead by terrestrial plants is limited by the low bioavailability of lead from soils; adverse effects seem to occur only at total concentrations of several hundred mg/kg lead in soil (Eisler 1988a). The maximum concentration of lead in undeveloped landfill surface soil was 2,223 mg/kg.

Among domestic and laboratory animals, several recognizable trends of lead poisoning have been observed. Effects of lead are more pronounced with organic lead compounds than inorganic lead complexes; younger developmental stages are the most sensitive to lead exposure; and effects are exacerbated by elevated temperatures and by diets deficient in minerals, fats, and proteins (ATSDR 1992a).

Birds of prey may ingest lead in the form of shot from dead or crippled game animals, or as biologically incorporated lead from lead-poisoned waterfowl, small roadside mammals, and invertebrates. Lead poisoning in carnivorous birds has been reported in various species of eagles, condors, vultures, and falcons, and most, if not all cases seem to result from ingestion of lead shot in food items. Ingestion of food containing biologically incorporated lead, although contributing to the lead burden of carnivorous birds, is unlikely in itself to cause clinical lead poisoning (Eisler 1988a).

Lead-poisoned birds show the following symptoms: loss of appetite; lethargy; weakness; emaciation; tremors; drooped wings; green liquid feces; and impaired locomotion, balance, and depth perception. Lead-poisoned birds also show microscopic lesions of the epithelium of the kidney and bone medullary osteocytes; an enlarged bile-filled gall bladder; anemia; elevated protoporphyrin IX levels in blood; decreased ALAD activity levels in blood, brain, and liver; reduced brain weight; abnormal skeletal development; cephalic edema; and esophageal impaction (Eisler 1988a).

U.2.2.6.6 Toxic Effects of Mercury on Wildlife

Mercury is known to be mutagenic and teratogenic, and causes embryocidal, cytochemical, and histopathological effects in living organisms. Methylmercury is the most toxic form of mercury to wildlife, with early developmental stages of animals being the most sensitive. Lethal concentrations of mercury range from 1 to 5 mg/kg for mammals and from 4 to 40 mg/kg for birds (Eisler 1987b).

Mammals are most sensitive to mercury in the fetal life stage, although symptoms may not be seen for months or years. Methylmercury affects fetal development by irreversibly destroying the neurons (nerve cells) of the central nervous system. Effects on different

organs vary depending on duration of exposure, metabolism within the organ, and either synergistic or antagonistic effects resulting from exposure to other SOPCs.

Methylmercury at elevated temperatures may act synergistically with pesticides such as DDE. In poisoned passerine birds, mercury residues exceeded 20 mg/kg fresh weight. Red-tailed hawks (*Buto jamaicensis*) are more sensitive to mercury than passerines (liver residues of mercury-killed birds were 17 mg/kg), while grey herons (*Ardea cinerea*) are very resistant (liver residues were 415 to 752 mg mercury/kg) (Eisler 1987b).

Mercury poisoned birds show the following signs: muscular incoordination, falling, slowness, fluffed feathers, calmness, withdrawal, and eyelid drooping. Sublethal effects include adverse effects on growth, development, reproduction, blood and tissue chemistry, metabolism, and behavior.

U.2.2.6.7 Toxic Effects of Zinc on Wildlife

Zinc is an essential trace element for all living organisms, aiding in the metabolism of proteins and nucleic acids and the synthesis of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). At elevated levels, zinc is toxic to animals, although mammals can ingest up to 100 times the daily requirement of zinc and show no deleterious effects.

Acute zinc poisoning of mammals can cause anorexia, depression, hemorrhagic enteritis, diarrhea, renal lesions, copper deficiency, impaired reproduction, decreased milk yield, excessive eating and drinking, convulsions, and death. Increased brain levels of zinc are associated with Pick's disease in some rodents with inherited epileptic seizures.

In birds, large amounts of zinc are necessary for new feather growth, and high dietary levels of zinc are often fed to poultry to force molting and reduce egg deposition. However, amounts of zinc that have no discernable effect on adult chickens can be toxic in chicks. High dietary levels of zinc in chicks also caused pancreatic damage, including reduced enzyme activity, elevated plasma amylase activities, reduced digestibility of starch, and reduced vitamin A activity (Eisler 1993).

U.2.2.6.8 Summary of Ecological Effects

Toxicological information is not available to evaluate all potential effects of each of the SOPCs on all the major groups of animals and plants. However, the available information suggests that a variety of potential ecological effects to select groups of wildlife could occur as a result of exposure to certain SOPCs on the undeveloped landfill. This, in turn, could have indirect effects on species within other trophic levels. If severe enough, SOPC-related effects could lead to a decrease in the survivability of certain wildlife groups on the undeveloped landfill. A quantitative review of toxicological endpoints and TBVs is provided in the ecological effects assessment (Section U.2.3.2).

U.2.2.7 Selection of Ecological Endpoints

Ecological endpoints are characteristics of ecological components within an ecosystem that may be adversely affected from exposure to SOPCs (EPA 1992a). Ecological risk assessment guidance specifies two types of endpoints: assessment and measurement (EPA 1992a). Assessment endpoints are the ultimate focus and link the ERA and risk management processes. Measurement endpoints are measurable responses to a stressor that are related to the valued characteristics chosen as the assessment endpoints. This section will describe the selection of assessment endpoints, measurement species and communities, and measurement endpoints for the undeveloped landfill.

U.2.2.7.1 Selection of Assessment Endpoints

Assessment endpoints are qualitative or quantitative expressions of "environmental values to be protected" (EPA 1992a). Often, assessment endpoints cannot be measured directly because they represent broad ecosystem components (e.g., the viability of a small mammal population which feeds on soil invertebrates). However, identification of these assessment endpoints is essential because they define those ecological components of the site ecosystem that are integral to its viability as a whole (which represents the ultimate assessment endpoint for any site). Potential effects to one of these assessment endpoints may indirectly affect other components of the site ecosystem (e.g., decreases in soil invertebrate populations due to soil contamination may limit the food source for species which feed on

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them). Assessment endpoints for the undeveloped landfill may include the population stability of groups of species at different trophic levels within the site ecosystem. In this ERA, these species and communities are termed measurement species and measurement communities and are the focus of the ERA. The following subsections present the selection of groups of species that are considered to represent the overall viability of the site ecosystem.

U.2.2.7.2 Selection of Measurement Species and Communities

This section presents the rationale for the selection of measurement species and communities for the terrestrial ecosystem at the site. Since the assessment of all wildlife species that potentially occur at the site is not feasible, species and communities were selected to relate potential effects of SOPCs at the site to the assessment endpoints of the site ecosystem (e.g., terrestrial vegetation, soil macroinvertebrates, small mammals, passerines [song birds], and raptors). Vertebrates selected for evaluation in this ERA are referred to as measurement species, and terrestrial vegetation and soil macroinvertebrate communities are referred to as measurement communities.

Measurement species and communities may be surveyed, sampled, or otherwise measured for exposure or effects. However, for the purpose of this ERA, exposure of measurement communities was estimated based on the comparison of ESI surface soil data to ecotoxicological values obtained from scientific literature. Due to the extensive number of species within plant and soil macroinvertebrate communities on the undeveloped landfill and the nature of toxicological data associated with each community, it was not feasible to select individual species within each of these communities that could be considered representative of potential adverse effects to each community as a whole. Toxicological data for these two communities is scarce and covers a broad spectrum of species and environmental conditions. Based on these factors, each measurement community was evaluated as a whole.

A systematic approach was taken to reduce the number of potential wildlife species to be considered as measurement species for the undeveloped landfill. First, a list of all flora and fauna potentially found at the undeveloped landfill (Tables V-3 through V-6) was compiled. At this point, reptiles and amphibians were eliminated from being considered as measurement species due to the lack of published ecotoxicological data. Next, the relative

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abundance of each species likely to occur at the site was evaluated. Only those species expected to be common at the site were considered. These species were divided into functional groups (assessment endpoint groups) by phylogenetic class and order (Table V-9).

Two passerine, one raptor and four mammalian groups were identified as potential functional groups for the site. One functional group from each of the mammalian and passerine groups was selected, based upon the highest potential for exposure to SOPCs at the site (i.e., the fossorial small mammal group was selected over the herbivorous small mammal group because burrowing mammals are likely to be exposed to greater concentrations of surface soil SOPCs). The raptor functional group was selected to evaluate the potential for biomagnification of SOPCs in top trophic level species. Mechanisms of toxicity for each SOPC were considered in the selection of functional groups on a qualitative basis because, generally, ecotoxicological data are unavailable for most species within any given functional group. Functional groups were selected from different phylogenetic classes and trophic levels to account for the potentially different mechanisms of toxicity. Ecological effects were considered and are summarized in Section U.2.2.6.

One measurement species within each of the three selected functional groups was chosen to represent potential risks to other species within the same group. Since functional groups selected are considered representative of the highest exposed groups of species, potential risk estimated for an indicator species is considered representative of risks to all other species within that same functional group (taxonomic class). Potential adverse effects to a functional group, in turn, represent effects to that component of the ecosystem to which the group belongs.

Selection of a measurement species from each functional group was dependent upon all of the following considerations as defined in regulatory guidance (EPA 1992a; EPA 1993a):

- Species that play important roles in community structure or function (e.g., top predators or major herbivores);
- Species of societal significance or concern (e.g., game species or familiar species);

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- Species that are of concern to federal and state agencies (e.g., threatened and endangered species);
- Diet, habitat preference, and behaviors that make the species likely to contact the SOPCs;
- Amenability of the selected species to measurement or prediction;
- Species from different taxa and/or trophic levels that might exhibit different toxic effects from SOPCs; and
- Species that have been shown to be particularly sensitive to the SOPCs being addressed.

Based on the approach and criteria presented above, the following measurement species and communities were selected for evaluation at the site: terrestrial vegetation, soil macroinvertebrates (e.g., earthworms), short-tailed shrew (*Blarina brevicauda*), American robin (*Turdus migratorius*), and American kestrel (*Falco sparverius*). Table V-10 presents a summary of the selected measurement species and communities and the potential pathways of exposure addressed in the ERA. The following discussion presents rationale for the selection of these measurement species and communities.

Terrestrial Vegetation

The undeveloped landfill is dominated by primary and secondary successional plant species which are listed in Section U.2.2.4. Terrestrial vegetation on the undeveloped landfill is extensive and provides a valuable resource for terrestrial wildlife which inhabit and utilize the site. Terrestrial vegetation was selected as a measurement community for the following reasons:

- The vegetative community provides habitat structure for wildlife species which inhabit the site and also represents the base of the terrestrial food chain;
- A variety of terrestrial plant communities inhabit the site;

- The terrestrial plant community is in continuous contact with SOPCs and, therefore, is representative of a maximally exposed community; and

- Data used in assessing phytotoxicity to terrestrial plant species from exposure to SOPCs are available for selected plant species.

Soil Invertebrates

The soil macroinvertebrate community on the undeveloped landfill consists of many species of insects, annelids, and other invertebrate classes. The soil macroinvertebrate community was selected as a measurement community for the following reasons:

- Soil macroinvertebrates represent the base of the terrestrial food chain;

- A variety of soil macroinvertebrate species inhabit the site;

- The soil macroinvertebrate community is in continuous contact with SOPCs and, therefore, is representative of a maximally exposed community; and

- Data used in assessing toxicity to soil macroinvertebrate species from exposure to SOPCs are available for selected soil macroinvertebrate species.

Because exposure and toxicity information is generally limited to earthworms, they will be considered representative of uptake and exposure of all soil macroinvertebrates on the undeveloped landfill.

Short-tailed Shrew

Exposure data are readily available for the northern short-tailed shrew; therefore, this information will be used to represent exposure to the southern short-tailed shrew which is likely to inhabit the site. The southern short-tailed shrew ranges throughout the south-central United States (Burton 1991). It is adapted to a wide variety of habitats and is common in areas with abundant vegetative cover.

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The shrew eats insects, worms, snails, and other invertebrates in addition to mice, voles, frogs, and other vertebrates. Because they are carnivorous, shrews can bioconcentrate SOPCs such as DDT at levels 10 times higher than either omnivorous mice or herbivorous voles. Shrews are also an important component of the diet of many raptors, foxes, weasels, and other carnivorous mammals. The shrew was selected as a measurement species at the site for the following reasons:

- It occupies an important niche in the terrestrial food chain of the site as a prey species for raptors;
- It serves as an indicator species for other small mammals within the same functional group;
- It potentially inhabits the site on a year-round basis;
- It is potentially in direct contact with SOPCs due to its burrowing and feeding habits and, therefore, is representative of a maximally exposed small mammal population at the site;
- Its maximum home range is 1.5 acres (EPA 1993a) and thus it is expected to be continually exposed to SOPCs at the site;
- Species-specific data used in assessing exposure from SOPCs through the ingestion of macroinvertebrates and soil are available for the shrew; and
- Mechanisms of toxicity of SOPCs are expected to be similar between the shrew and other small mammals likely to be found at the site.

No shrews were observed during the reconnaissance survey; however, the site provides suitable habitat to support shrew populations.

American Robin

The American robin occurs throughout most of the continental United States and Canada during the breeding season and winters in the southern half of the United States, Mexico, and Central America (EPA 1993a). Access to fresh water, protected nesting sites, and productive foraging areas are important requirements for breeding robins. Breeding

habitats include moist forests, swamps, open woodlands, orchards, parks, and lawns. During the nonbreeding season, robins prefer moist woods or fruit-bearing trees and shrubs.

Robins forage on the ground in open areas, along habitat edges, or the edges of streams; they also forage above ground in shrubs and within the lower branches of trees (EPA 1993a). In the months preceding and during the breeding season, robins feed mainly (greater than 90% volume) on invertebrates; during the remainder of the year, their diet consists primarily (over 80% by volume) of fruits. Commonly eaten fruits include plums, dogwood, sumac, hackberries, blackberries, cherries, greenbriers, raspberries, and juniper; commonly eaten invertebrates include earthworms, caterpillars, moths, grasshoppers, spiders, millipedes, and beetles. The robin was selected as a suitable avian receptor for the site for the following reasons:

- It occupies an important niche in the terrestrial food chain of the site as a prey species for raptors;
- It serves as an indicator species for other birds within the same functional group;
- It potentially inhabits the site on a year-round basis;
- It is potentially in direct contact with SOPCs due to its feeding habits and, therefore, is representative of the maximally exposed passerine population at the site;
- Its maximum home range is 2 acres (EPA 1993a) and thus it is expected to be continually exposed to SOPCs at the site;
- Species-specific data used in assessing exposure from SOPCs through the ingestion of macroinvertebrates, fruit, and soil are available for the robin; and
- Mechanisms of toxicity of SOPCs are expected to be similar between the robin and other passerine species likely to be found at the site.

American Kestrel

The American kestrel, or sparrow hawk, is the most common falcon in open and semi-open areas throughout North America (EPA 1993a). Kestrels inhabit open deserts,

semi-open areas, the edges of groves, and even cities. In urban situations, areas frequently considered "waste areas" are valuable to this small falcon (Brack *et al.* 1984).

Kestrels prey on a variety of small animals including invertebrates such as worms, spiders, scorpions, beetles, and other large insects; amphibians, such as frogs; and reptiles such as lizards and snakes; and a wide variety of small- to medium-sized birds and mammals (EPA 1993a). The kestrel was selected as a measurement species for the following reasons:

- It potentially utilizes the site;
- It is potentially exposed to SOPCs through food chain accumulation and biomagnification;
- Species-specific data used in assessing exposure from SOPCs through the ingestion of small mammals and birds is available for the kestrel; and
- Mechanisms of toxicity of SOPCs are expected to be similar between the kestrel and other raptor species likely to be found at the site.

There have been tentative sightings of American kestrels within the vicinity of the site. However, none were observed on-site by E & E ecologists.

U.2.2.7.3 Selection of Measurement Endpoints

Measurement endpoints are measurable responses to SOPCs that can be evaluated through monitoring or sampling activities, and can then be related quantitatively or qualitatively to the assessment endpoint(s). In this risk assessment, it was not feasible to measure actual environmental effects to measurement species. Therefore, the measurement endpoints were derived from published values of chronic and acute toxicity of SOPCs in food, environmental media, or tissues of measurement species or their surrogates. Measurement endpoints are generally selected to be indicative of significant effects on survival, reproduction, or growth of the measurement species. Each of these more specific assessment endpoints represent measures of the population stability, yet confine the ERA to more specific concerns which are easier to assess in the determination of any potential ecological risks. For the ERA, the assessment endpoints include the following:

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- Predicted effects of SOPCs on the reproduction, growth, survival, and/or population dynamics (beyond normal successional changes) of terrestrial vegetation and soil macroinvertebrate communities; and

- Predicted effects of SOPCs on the reproduction, growth, and survival of the short-tailed shrew, robin, and kestrel due to direct toxicity and bioaccumulation and/or food chain biomagnification.

Considerations for selection of measurement endpoints for measurement species include: relevance to and consistency with the assessment endpoints, sensitivity, rapidity and low variability of response to SOPCs, and ease of measurement (EPA 1992a). The particular measurement endpoints used in this ERA are associated with the TBVs selected in the Ecological Effects section of the Phase I ERA (Section U.2.3.2).

U.2.2.8 Development of the Focused Ecological Conceptual Site Model

Figure U-5 presents measurement species and pathways selected for the focused ecological conceptual site model. The model is termed a focused conceptual site model because of its narrow focus on the needs of the ERA. The focused ecological conceptual site model presents a hypothesis which describes and delineates the relationship between the potential effects of SOPCs and the assessment endpoints selected for the undeveloped landfill. This relationship will be assessed during the remainder of the Phase I and Phase II ERAs. The focused ecological conceptual site model for the site can be summarized by the following working hypothesis:

- There is a potential for adverse ecological effects to terrestrial wildlife from exposure to SOPCs found in the surface soils of the undeveloped landfill.

Surface soils on the undeveloped landfill are contaminated with a variety of organic and inorganic SOPCs. These SOPCs could potentially affect terrestrial wildlife as a result of transfer to higher trophic levels through bioaccumulation or biomagnification. Components of the landfill ecosystem potentially affected by these SOPCs include vegetation; soil inverte-

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brates; small mammals and birds that feed on the native vegetation and soil invertebrates; and raptors that prey on small mammals, birds, and insects.

U.2.3 ANALYSIS

The analysis phase of the ERA evaluates receptor exposure to SOPCs (see Section U.2.3.1) and the toxicological effects associated with each SOPC on the measurement species and communities identified during the problem formulation (see Section U.2.3.2). These activities were conducted interactively to ensure that the methods used to evaluate exposure and effects were compatible. Analysis of exposure and effects was based on the ecological endpoints and the focused conceptual site model derived during problem formulation (see Section U.2.2.7).

U.2.3.1 Exposure Assessment

The exposure assessment for the undeveloped landfill involved quantifying potential exposure to site-related SOPCs by measurement species and communities identified in the problem formulation (see Section U.2.2.5). To derive these estimates, assumptions were made regarding the selected species' contact with and uptake of SOPCs. Exposure parameters were derived from published literature values. The exposure assessment is divided into the following sections:

- Exposure Point Concentrations (see Section U.2.3.1.1); and
- Exposure Estimates (see Section U.2.3.1.2).

U.2.3.1.1 Exposure Point Concentrations

The selected exposure medium of ecological concern at the site is surface soil. For this medium, the maximum exposure case was considered in the Phase I ERA. Maximum SOPC concentrations were used as reasonable maximum exposure (RME) estimates because the limited sample size ($\underline{n}$ = 4) and sampling method (biased) did not allow for a statistically valid calculation of the 95% upper confidence limits or upper tolerance limits. Therefore, the

exposure point concentrations (EPCs) calculated for the RME exposure case are the maximum concentrations of SOPCs in undeveloped landfill surface soil (Table V-11).

U.2.3.1.2 Exposure Estimates

This section discusses the assumptions and methods used to estimate exposure of selected measurement species and communities to SOPCs. Exposure estimates are calculated for the short-tailed shrew, the American robin, and the American kestrel.

Exposure Assumptions for Undeveloped Landfill Measurement Communities

Estimating the potential exposure of all plant and soil macroinvertebrate species that inhabit the undeveloped landfill was not feasible. For both phases of the ERA, the exposure of plants and soil macroinvertebrates to SOPCs were evaluated by reviewing the scientific literature for a subset of species within these two communities. Potential exposure of vegetation and soil invertebrates to SOPCs is not usually measured in terms of a dose but rather by comparison to experimentally-derived soil concentrations. A direct comparison of undeveloped landfill soil SOPC concentrations with ecological effects data for plants and macroinvertebrates is presented in the Risk Characterization section (see Section U.2.4).

Exposure Assumptions for the Short-Tailed Shrew. The shrew is carnivorous and is potentially exposed to SOPCs in undeveloped landfill surface soil through ingestion of macroinvertebrates which have potentially bioaccumulated SOPCs found in the soil (see Vegetation, Earthworm, and Insect Bioaccumulation Factors section) and through direct ingestion of contaminated soil. The exposure algorithms used to evaluate these exposure pathways are described below.

For this assessment, potential exposure to the shrew from SOPCs was evaluated based on the consumption of earthworms. Although the diet of the shrew does not consist entirely of earthworms, they were used to represent all soil macroinvertebrates in estimating exposure, since (1) the earthworm is one of the few invertebrates for which bioaccumulation of SOPCs can be readily estimated, and (2) earthworms would be expected to significantly

bioaccumulate selected SOPCs found in surface soil as a result of both dermal absorption and soil ingestion.

In order to calculate an exposure estimate of earthworm ingestion by the shrew, the following exposure parameters were derived: body weight, ingestion rate, percentage of diet made up by each dietary item, site use factor, and exposure duration. A body weight of 0.0225 kilograms and a wet weight ingestion rate of 0.02 kilograms per day was assumed for the shrew, based on a minimum of reported body weights and a maximum of reported ingestion rates, respectively (EPA 1994, 1993a). In order to convert this ingestion rate to dry weight, a moisture value of 80% was estimated for the shrew's prey (Beyer 1994). Multiplying the dry weight percentage (20%) by the wet weight ingestion rate yields a dry weight ingestion rate of 0.004 kilograms per day. The dietary intake of the shrew is assumed to occur entirely on the undeveloped landfill, since its maximum home range of 1.5 acres (EPA 1993a) falls within the boundaries of the undeveloped landfill. Therefore, the site use factor (calculated by dividing the site area by the home-range area [to a maximum of 1.0]) for the shrew is 1. The shrew is also considered to be a year-round resident; therefore, its exposure duration is 1.

The shrew is also potentially exposed to SOPCs through the incidental ingestion of soil while foraging. All exposure parameters derived for the earthworm exposure dose, except percentage of diet represented, were used for the estimation of a soil exposure dose. Soil ingestion for the shrew was calculated as a percentage of its total daily dietary intake. Because a species-specific soil ingestion rate was unavailable for the shrew, a value was obtained from a species with similar feeding habits. A soil ingestion rate of 10.4% of the shrew's daily dietary intake was estimated from a value reported for a woodcock, which also feeds on soil macroinvertebrates (EPA 1993a). Based on this percentage, a dry weight soil ingestion rate of 0.0004 kilograms per day was calculated for the shrew. The exposure parameters for the shrew are presented in Table V-12. Exposure doses for the shrew are presented in Table V-13.

Exposure Assumptions for the American Robin. The robin is omnivorous and is potentially exposed to SOPCs in undeveloped landfill surface soil through the ingestion of

fruit and macroinvertebrates (EPA 1993a) which have potentially bioaccumulated SOPCs from the soil and through direct ingestion of soil (see Vegetation, Earthworm, and Insect Bioaccumulation Factors section). The exposure algorithms used to evaluate these exposure pathways are described below.

As with the shrew, macroinvertebrate ingestion by the robin does not entirely consist of earthworms, but for the same reasons presented for the shrew, it is assumed that earthworms represent the primary macroinvertebrate species consumed by the robin at the site.

In order to calculate exposure estimates of earthworm and fruit ingestion by the robin, the following exposure parameters were derived: body weight, ingestion rate, percentage of diet made up by each dietary item, site use factor, and exposure duration. A body weight of 0.093 kg and a wet weight ingestion rate of 0.18 kg per day was assumed for the robin, based on minimum of reported body weights and a maximum of reported ingestion rates, respectively (EPA 1994, 1993a). Again, as in the case for the shrew, a dry weight ingestion rate was calculated using a food moisture value of 80% (Beyer 1994). Based on this value, a dry weight ingestion rate of 0.036 kilograms per day was calculated for the robin. In order to estimate the ratio of earthworms to fruit consumed daily by the robin, food item consumption data were evaluated (EPA 1993a). Based on seasonal averages during a one-year period, earthworms and fruit were assumed to each make up 50% of the robin's diet. The dietary intake of the robin is assumed to occur entirely on the undeveloped landfill, since its maximum home range of 2 acres (EPA 1993a) falls within the boundaries of the undeveloped landfill. Therefore, the site use factor for the robin is 1. An exposure duration value of 1.0 was used for the robin because it was conservatively assumed to be a year-round resident.

The robin is also potentially exposed to SOPCs through the incidental ingestion of soil while foraging. All exposure parameters derived for the earthworm and fruit exposure doses, except percentage of diet represented, were used for the estimation of a soil exposure dose. Soil ingestion for the robin was calculated as a percentage of its total daily dietary intake. Because a species-specific soil ingestion rate was unavailable for the robin, a value was obtained from a surrogate species with similar feeding habits. A soil ingestion rate of 10.4% of the robin's total daily diet was estimated from a value reported for a woodcock, which also feeds on soil macroinvertebrates. Based on this percentage, a soil ingestion rate of

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0.0037 kilograms per day was calculated for the robin. The exposure parameters for the robin are presented in Table V-12. Exposure doses for the robin are presented in Table V-14.

Exposure Assumptions for the American Kestrel. The American kestrel is carnivorous and is potentially exposed to SOPCs in undeveloped landfill surface soil through the ingestion of small mammals, birds, and insects which have potentially bioaccumulated SOPCs found in undeveloped landfill surface soil (see Vegetation, Earthworm, and Insect Bioaccumulation Factors, and Shrew and Robin Bioaccumulation Factors sections). The exposure algorithms used to evaluate these exposure pathways are described below.

For this assessment, potential exposure of the kestrel to SOPCs was evaluated based on consumption of shrews, robins, and insects. Although it is unlikely that shrews and robins represent all of the small mammal and bird species potentially consumed by the kestrel, these species are potentially maximally exposed to SOPCs because they feed on soil macroinvertebrates which may accumulate significant amounts of SOPCs from undeveloped landfill surface soil.

In order to calculate an exposure estimate of shrew and robin ingestion by the kestrel, the following exposure parameters were derived: body weight, ingestion rate, percentage of diet made up by each dietary item, site use factor, and exposure duration. A body weight of 0.159 kilograms and a wet weight ingestion rate of 0.055 kilograms per day was assumed for the kestrel, based on minimum of reported body weights and a maximum of reported ingestion rates, respectively (EPA 1994, 1993a). In order to convert this ingestion rate to dry weight, a moisture value of 71.4% was used for the kestrel's prey (Talmage and Walton 1991). Multiplying the dry weight percentage (26%) by the wet weight ingestion rate yields a dry weight ingestion rate of 0.015 kilograms per day. In order to estimate the percentages of small mammals, birds, and insects consumed daily by the kestrel, food item consumption information for kestrels inhabiting urban environments was evaluated (Brack *et al.* 1984). Based on several months of daily observations over the course of a two-year period, it was determined that the daily percentages of small mammal, bird, and insect ingestion are, on average, 47%, 52%, and 1%, respectively. The undeveloped landfill is expected to represent

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approximately 22% of the kestrel's foraging habitat due to its extensive home range (180 acres) (EPA 1993a). Therefore, the site use factor for the kestrel is 0.22. An exposure duration value of 1.0 was used for the kestrel because it was conservatively assumed to be a year-round resident. The exposure parameters for the kestrel are presented in Table V-12. Exposure doses for the kestrel are presented in Table V-15.

Summary Intake Formulas for Measurement Species

The total exposure of the shrew and the robin was calculated as the sum of the food and soil ingestion exposure estimates, while the total exposure of the kestrel was assumed to occur only through prey items. The following equation summarizes the total estimated exposure for each measurement species:

$$EE_{total} = EE_{diet} + EE_{soil}$$

where:

EE_{total}	=	Total estimated exposure (mg/kg body weight [BW] day)
EE_{diet}	=	Estimated exposure from diet (mg/kg BW day)
EE_{soil}	=	Estimated exposure from soil ingestion (mg/kg BW day)

Exposure estimates for measurement species from dietary exposure and exposure from ingestion of soil were calculated by multiplying concentrations of SOPCs in appropriate media (e.g., soil, plant tissue, or prey tissue) by the proportion of that medium or food item in the diet; summing these values; multiplying by the receptor's site use factor (SUF), exposure duration (ED), and ingestion rate (IR); and dividing by the receptor's body weight (BW).

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The exposure parameters used for these calculations are provided in Table V-12 (with the exception of prey tissue concentrations, which are discussed in later in this section. Dietary exposure is conservatively represented mathematically as:

$$EE_{diet} = \frac{[(P_1 \times T_1) + (P_2 \times T_2) + \cdots (P_n \times T_n)] \times SUF \times ED \times IR}{BW}$$

where:

EE_{diet} = Estimated exposure from diet (mg/kg BW day).

P_n = Percentage of diet represented by each dietary item n ingested.

T_n = Tissue concentration in dietary item n (mg/kg) (calculated by multiplying the SOPC concentration in vegetation or prey by a plant uptake factor [PUF] or a bioaccumulation factor [BAF], respectively).

SUF = Site use factor, equal to the area of contaminated site (acres) divided by area of home range (acres) to a maximum of 1.0.

ED = Exposure duration (unitless), equal to the fraction of the year spent in the region.

IR = Ingestion rate of receptor (kg dry weight [DW]/day).

BW = Body weight of receptor (kg).

For those SOPCs which lacked earthworm, small mammal, and/or bird BAF data, this equation conservatively assumes that once SOPCs are ingested, there is 100% absorption in the digestive tract of each receptor. Therefore, the ingested dose becomes the tissue concentration for that receptor (EPA 1994). The exposure of the shrew and robin to SOPCs via the ingestion of surface soil is summarized as follows:

$$EE_{soil} = \frac{(P_s \times C_{soil}) \times SUF \times ED \times IR}{BW}$$

Where:

EE_{soil}	=	Estimated exposure from soil ingestion (mg/kg BW day).
P_s	=	Percentage of diet represented by soil ingestion.
C_{soil}	=	Soil concentration (mg/kg).
SUF	=	Site use factor, equal to the area of contaminated site (acres) divided by area of home range (acres) to a maximum of 1.0.
ED	=	Exposure duration (unitless), equal to the fraction of the year spent in the region.
IR	=	Ingestion rate of receptor (kg dry weight [DW]/day).
BW	=	Body weight of receptor (kg).

This equation conservatively assumes that SOPCs in soil are 100% bioavailable and that once ingested, there is 100% absorption in the digestive tract of each receptor (EPA 1994).

Uptake and Food-Chain Exposure Calculations

Potential SOPC transfer from undeveloped landfill surface soil to plant and animal tissues was estimated from either published bioaccumulation factors or published uptake models. These SOPC-specific bioaccumulation factors are referred to as plant uptake factors (PUFs) for vegetation and bioaccumulation factors (BAFs) for earthworms, insects, shrews, and robins.

Vegetation, Earthworm, and Insect Bioaccumulation Factors

When available, SOPC-specific, literature-derived PUFs and earthworm BAFs were used to estimate tissue concentrations for plants and earthworms on the undeveloped landfill, respectively. Due to the lack of insect BAF data, earthworm BAFs were substituted

(EPA 1994). The accumulation of SOPCs in plants and earthworms is dependent on numerous factors, such as soil type, pH, organic content, and plant and earthworm species. Therefore, when more than one PUF/BAF was available for a SOPC, the PUF/BAF that was determined at conditions most similar to those found on the undeveloped landfill was selected and is highlighted in Table V-8. The PUFs/BAFs for plants and earthworms were calculated by comparing reported plant and earthworm tissue concentrations to soil concentrations specific to that study as shown in the following equation:

$$\text{PUF/BAF} = \frac{\text{Concentration in Plant or Earthworm Tissue}}{\text{Concentration in Soil}} \qquad (4)$$

Table V-8 provides a list of all the PUFs and earthworm BAFs used in this assessment and their sources. Empirically derived PUFs and BAFs from literature values were selected whenever possible. However, they were not available for all SOPCs. In the absence of published BAF data for earthworms, 100% bioaccumulation was assumed (i.e., BAF = 1) (EPA 1994).

In cases where published SOPC-specific PUFs were unavailable, PUFs were calculated using literature-derived models. Table V-8 highlights those SOPCs for which PUFs were unavailable. Because it was assumed that fruit (seeds) is the only vegetative item consumed by the robin and because these plant parts may accumulate SOPCs at different rates than the stems and leaves, PUFs for reproductive plant parts were used whenever available. Modeled PUFs used for site-related inorganic SOPCs were based on transfer coefficients developed for the reproductive portions of the plant (e.g., fruit) (Baes *et al.* 1984; Table V-8). The PUFs for site-related organic SOPCs were calculated using a regression equation developed to calculate BAFs of SOPCs in aboveground plant parts (Travis and Arms 1988; Table V-8). This regression equation is based on the relationship of the octanol-water partition coefficient (K_{ow}) and plant accumulation, and also on the evaluation of 29 chemicals with K_{ow}s ranging from 1.15 to 9.35. Because of this, the model is valid only for chemicals with octanol-water partition coefficients between 1.15 and 9.35. Acetone was the only SOPC not evaluated due to its log K_{ow} (K_{ow} = -0.24). The model equation is as follows:

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$$\text{Log (PUF)} = 1.588 - 0.578 \log K_{ow} \quad (5)$$

PUFs calculated using this equation do not differentiate between reproductive and vegetative portions of the plant. Log K_{ow}s and PUFs calculated for each SOPC are presented in Table V-8 (see Appendix V).

Once the PUFs for fruit were derived, SOPC concentrations in fruit were calculated by:

$$T_{fruit} = C_{soil} \times PUF \quad (6)$$

Where:

T_{fruit} = Tissue concentration of SOPCs in fruit (mg/kg).

C_{soil} = SOPC concentration in soil (mg/kg).

PUF = Plant uptake factor.

Calculated tissue concentrations for the reproductive portions of plants are presented in Table V-16).

PUFs were multiplied by SOPC concentrations to provide estimates of SOPC tissue levels in the reproductive portion (fruit) of the plant. Using equation (2), these tissue concentrations were then used to estimate exposure to birds which potentially feed on fruit.

Earthworm BAFs were estimated using empirical data from scientific literature as indicated in Table V-8. Multiplying earthworm BAFs by the concentrations of SOPCs in soil provided estimates of SOPC tissue levels in earthworms ($T_{earthworm}$). Using equation (2), these tissue concentrations were then used to estimate exposure to mammals and birds which potentially feed on earthworms. Calculated tissue concentrations for earthworms are presented in Table V-17.

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Shrew and Robin Bioaccumulation Factors

The BAFs for higher trophic levels incorporate the use of food-chain transfer factors which are intermediary concentration factors between one species and another. For example, the earthworm-to-shrew food-chain transfer factor may be necessary to calculate a BAF for the shrew. In this example, the food-chain transfer factor represents the percentage of a contaminant in earthworm tissues that would accumulate in the shrew tissues. The earthworm-to-shrew transfer factor must then be multiplied by the earthworm BAF to obtain the shrew BAF. This use of food-chain transfer factors between species is necessary because BAFs are concentration factors from soil to the species of concern, not species-to-species measures. When available, empirical SOPC-specific mammal and bird food-chain factors were used to estimate BAFs for shrews and robins on the undeveloped landfill. Data on chemical concentrations in wild animals, as opposed to domestic or laboratory animals, were used when available. In the absence of published BAF data for small mammals and birds, 100% bioaccumulation was assumed (i.e., BAF = 1) (EPA 1994). Multiplying small mammal or bird BAFs by concentrations of SOPCs in soil provides an estimate of SOPC tissue concentrations in small mammals and birds (Tables V-18 and V-19, respectively). Using equation (2), these tissue concentrations were then used to estimate exposure to predators of small mammals and/or birds.

U.2.3.2 Ecological Effects Assessment

The purpose of the ecological effects assessment is to characterize the potential toxicity of SOPCs to measurement species and communities which potentially inhabit or utilize the undeveloped landfill. The ecological effects assessment presents an overview of the sources of toxicological information and methods for selection and is divided into the following sections:

- Toxicity Benchmark Values (TBVs) (see Section U.2.3.2.1);
- Safety Factors (see Section U.2.3.2.2); and
- Toxicity Reference Values (TRVs) (see Section U.2.3.2.3).

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The TBVs, expressed in terms of a dose (e.g., mg/kg-bw/day), were selected from literature toxicity values for measurement species or similar species. Safety factors were applied to the TBVs to derive TRVs for use in the assessment of potential risks to mammalian and avian measurement species. In the assessment of potential risks to communities (e.g., terrestrial vegetation and soil macroinvertebrates), published toxicity information was compared directly to surface soil contaminant concentrations.

U.2.3.2.1 Toxicity Benchmark Values

TBVs are doses or concentrations of SOPCs that are considered to be the most conservative and defensible thresholds for adverse effects of the SOPCs on particular groups of species or communities. A comprehensive literature and database search was performed to identify relevant TBVs for measurement species and communities on the undeveloped landfill. The principal data sources included:

- Primary literature sources (journal articles and scientific publications).
- Registry of Toxic Effects of Chemical Substances (RTECS 1994).
- Hazardous Substances Database (HSDB 1994).
- Integrated Risk Information System (IRIS 1994).
- Toxicological Profile Series of the Agency for Toxic Substances and Disease Registry (ATSDR).
- Phytotox Database (PHYTOTOX) (EPA 1992c).
- Chemical Evaluation Search and Retrieval System (CESARS 1994).
- Oil and Hazardous Materials/Technical Assistance Database (OHM/TADS 1994).

Because toxicity data for measurement species were often unavailable for SOPCs, toxicity data for species in the same functional group or other related species were used to identify TBVs. Where possible, only chronic no observed adverse effect levels (NOAEL)

were used for the Phase I ERA. Chronic lowest observed adverse effect levels (LOAEL) also were derived for use in the Phase II ERA to provide a range of threshold values for adverse effects. The NOAEL and LOAEL were used because the threshold toxicity concentration is likely to fall between these two values. In the absence of NOAEL or LOAEL values, other values such as LD_{LO}s (lowest reported lethal doses) or LD_{50}s (doses at which half of the population dies) were utilized. Data for chronic toxicity were chosen when available, but sub-chronic and/or acute data were used if chronic data were unavailable. If toxicity data were unavailable for a SOPC, that SOPC was not evaluated quantitatively in the Risk Characterization section.

For most SOPCs, several sources were available for the selection of a TBV. These sources provided data associated with a variety of toxicological endpoints and critical mechanisms and effects. The process of selecting a toxicity (measurement) endpoint for use as a TBV required an assessment of the appropriateness of various endpoints. In general, data indicative of overt health effects to individual organisms that may result in population level effects, such as reproductive impacts, were preferred. Other less adverse effects data such as changes in organ weight or subtle physiological effects, which are less likely to be directly associated with adverse population effects, were only used in the absence of the preferred toxicity data. Specific toxic effects were broadly grouped and listed preferentially as follows:

- **Primary Significance**—Reproductive effects (e.g., decreased fertility, teratogenicity, developmental effects, fetal resorption, etc.) which could impact the species population; survivability of the affected species which could determine population numbers in following generations; severe histopathological effects (necrosis or other damage to target organ tissues including the liver, kidney, brain/central nervous system, lungs, stomach, pancreas, etc.) which could impact primary body functions resulting in mortality of adults or offspring.

- **Secondary Significance**—Alteration in bio-functions of organs that, based on degree of alteration, could result in decreased survivability (e.g., acetylcholinesterase inhibition in peripheral and central nervous system, resulting in uncontrolled nervous system function); or

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alterations in behavior that may result in decreased survivability of receptor (e.g., impaired motor skills, increased reaction time, altered feeding habits, etc.)

- **Tertiary Significance**—Organism alterations not readily associated with decreased survivability or longevity (e.g., decreased liver size, increased blood lead, increased body weight).

Carcinogenic endpoints were not considered appropriate for use in the identification of TBVs. A number of factors confound the extrapolation of carcinogenic toxicity data between species of the same phylogenetic class:

- The lack of a dose response threshold associated with carcinogenic SOPCs precludes the derivation of a TRV analogous to a NOAEL; and
- The latency period for tumor induction due to exposure at environmental doses is potentially greater than the lifetime of the ecological receptor of concern.

Toxicity data reported as dietary concentrations (i.e., parts per million [ppm] or mg/kg in food) were converted to a dose (i.e., mg/kg-bw as an average daily intake) using data presented in the source study or from information on average ingestion rates and BWs of test animals (EPA 1993a, 1988).

TBVs are presented in Table V-20. Vegetation and soil invertebrate toxicity data are listed in Tables V-21 and V-22, respectively. The TBVs and vegetation and soil invertebrate toxicity data from the Phase II ERA were also included in Tables V-20, V-21, and V-22, respectively, to avoid repetition of tables in separate phases of the ERA. For all SOPCs detected in ESI surface soil, pertinent toxicological data were reviewed and TBVs were selected from the following reviews of the toxicological literature.

Volatile Organic Compounds

Acetone. Acetone is a chemical that is found naturally in the environment. It is also normally present in animals from the breakdown of fat. It can also be used in normal processes that make sugar and fats for energy (ATSDR 1993d) but high exposure rates can

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result in hepatic and renal damage, and reproductive effects. Acute oral LD_{50} values were found only for rats. In general, the lethality of acetone decreases with the age of the rat (Kimura *et al.* 1971). The LD_{50} values ranged from 1,726 mg/kg-bw for newborn rats to 6,667 mg/kg-bw for older adult rats. Mice treated with 3,500 mg/kg-bw during gestation had reduced postnatal pup survival, increased gestation duration and reduced reproduction index (EHRT 1987). In a 13-week drinking water study, increased liver weights were observed in rats treated with 1,600 mg/kg-bw (Dietz *et al.* 1991). Kidney weights were increased in male and female rats exposed to 3,400 mg/kg-bw and 1,600 mg/kg-bw, respectively for 14 days in drinking water (Dietz *et al.* 1991). No effects were observed in male rats exposed to 1,071 mg/kg-bw for six weeks in drinking water (Larsen *et al.* 1991) but renal effects were found (LOAEL) at 500 mg/kg-bw (ATSDR 1993d). A NOAEL of 100 mg/kg-bw for rats was reported in IRIS (1994). These two values were used as TBVs in the Phase I ERA.

Acetone does not appear highly toxic to birds. A NOAEL for overt (visual) signs of toxicity was reported at 5,270 mg/kg-bw for japanese quail (Hill and Camardese 1986). This value was used as a TBV in the ERA. No data were found regarding the toxic effects of acetone on vegetation or soil invertebrates.

Chloroform. Chloroform is also known as trichloromethane. It is ubiquitous, especially in drinking water as an unwanted by-product during the process of adding chlorine to water (ATSDR 1992d). The central nervous system is a target of chloroform toxicity after oral exposure. High single doses of chloroform caused ataxia, incoordination, and anesthesia in mice (Balster and Borzelleca 1982). Acute oral LD_{50} values vary in animals. Acute LD_{50} values of 2,000 mg/kg-bw chloroform (Torkelson *et al.* 1976) and 2,180 mg/kg-bw (Smyth *et al.* 1962) were reported for rats. An acute oral LD_{50} value of 1,100 mg/kg-bw was reported for mice (Jones *et al.* 1958). Pregnant animals may be more susceptible to the effects of exposure to chloroform. Increased mortality was observed in rats exposed to 516 mg/kg-bw and rabbits exposed to 100 mg/kg-bw during gestation (Thompson *et al.* 1974). No effect on reproduction (NOAEL) was observed in rats chronically exposed to 47.6 mg/kg-bw, and no effects were noticed on the liver at 100 mg/kg-bw (ATSDR 1992d).

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Corn and wheat seeds were found to have reduced germination when exposed to pure chloroform. This concentration resulted in a 73% reduction in germination of the corn seeds and an unspecified decrease in the germination of the wheat seeds (CESARS 1994). No data were located regarding the toxic effects of chloroform on soil invertebrates or birds.

Ethylbenzene. Few studies have been done on the oral route of exposure for ethylbenzene. The acute LD_{50} for rats fed ethylbenzene was 4,728 mg/kg-bw (ATSDR 1990b). Acute oral exposure at 500 to 1,000 mg/kg-bw decreased peripheral hormone levels and blocked or delayed the estrus cycle in female rats (Ungvary and Tatrai 1985). Ninety day oral exposure to 408 mg/kg-bw of ethylbenzene resulted in histopathological effects to the liver and kidney of rats (IRIS 1994). This concentration represents the LOAEL used for this assessment. No data were found regarding the toxic effects of acetone on birds, vegetation, or soil invertebrates.

Tetrachloroethene. The liver, kidneys, and blood are targets for acute oral toxicity (ATSDR 1993e). The acute oral LD_{50} for tetrachloroethylene was 3,005 to 3,835 mg/kg-bw in rats and 5,000 mg/kg-bw in mice (Hayes *et al.* 1986; Wenzel and Gibson 1951). Hepatic effects were seen after a single oral dose of 995 mg/kg-bw in rats (Story *et al.* 1986). The hepatic and renal systems are also targets in chronic exposure to tetrachloroethylene. Both increased death and severe renal damage were seen in rats and mice exposed to tetrachloroethylene for 78 weeks (ATSDR 1993e). In the study, the rat LOAEL was 471 mg/kg-bw, while the mouse LOAEL was 536 mg/kg-bw. The mouse NOAEL for hepatic effects over a six-week period was 20 mg/kg-bw (Buben and O'Flaherty 1985). No data were found regarding the toxic effects of tetrachloroethene on avifauna, vegetation, or soil macroinvertebrates.

Toluene. The rat acute, oral LD_{50} for toluene varies from 2,600 mg/kg-bw to 7,300 mg/kg-bw (Kimura *et al.* 1971; Smyth *et al.* 1969). Death occurred in 100% of mice at a single, oral dose level of 6,810 mg/kg toluene diisocyanate (NTP 1986a). The central nervous system appears to be a target for acute oral toxicity (WHO 1985). Exposure to

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toluene diisocyanate was associated with labored breathing, inactivity, and diarrhea prior to death in rats (NTP 1986a). Hepatic and renal system effects were seen in rats exposed to 625 mg/kg/day toluene for 13 weeks (NTP 1990). The NOAEL in this study was 312 mg/kg-bw for these systems. Toluene does appear to be associated with animal fetotoxicity (Donald *et al.* 1991). A LOAEL for embryonic lethality for mice was 260 mg/kg-bw (WHO 1985). The LOAEL for neurological effects in both species was 1,250 mg/kg/day. No data were found regarding the toxic effects of toluene on avifauna, vegetation, or soil invertebrates.

Xylene. Xylene generally refers to mixed xylene which is composed of three isomers of xylene (*o*, *m*, and *p)* and a small percentage of ethylbenzene. The *m*-xylene isomer predominates in mixed xylene. Rat LD_{50} values vary depending on the mode of intake. Acute oral LD_{50} values in male and female mice were 5,627 and 5,251 mg/kg-bw, respectively (NTP 1986b). The oral LD_{50} value of undiluted xylene is 5,251 mg/kg-bw (Hine and Zuidema 1970) compared with 3,523 mg/kg-bw if administered diluted in corn oil (NTP 1986b). The LD_{50} value for *m*-xylene in rats is 6,661 mg/kg-bw (Smyth *et al.* 1962). The differences in LD_{50} values may be due to specific isomer composition of the xylene mixtures, gender, nutritional status, and solvent in which xylene is administered (ATSDR 1993f). The highest NOAEL in rats and mice was 1,000 mg/kg-bw *o*-xylene, above which respiratory, cardiovascular, gastrointestinal, hematopoietic, musculo-skeletal, hepatic, and renal systems are adversely affected (NTP 1986b). This concentration was chosen for the assessment of xylene effects to the measurement species at the site and is below any known LOAELs for xylene. Other NOAELs found included a lack of reproductive effects at 800 mg/kg-bw (ATSDR 1993f) and no mortality at 179 mg/kg-bw (IRIS 1992).

Information on xylene toxicity to avifauna is scarce. The oral LD_{50} value in Japanese quail is greater than 2,876 mg/kg-bw and evidence of overt toxicity is observed above concentrations of 719 mg/kg-bw (Hill and Camardese 1986). The data from Hill and Camardese (1986) was selected as the representative avian NOAEL for use in this assessment. No data were located regarding the toxic effects of xylene on vegetation or soil invertebrates.

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Semivolatile Organic Compounds

4-Methylphenol. No data were available regarding the toxicity of 4-methylphenol to vegetation, soil invertebrates, mammals, or avian species.

Carbazole. No data were available regarding the toxicity of carbazole to vegetation, soil invertebrates, mammals, or avian species.

Dibenzofuran. No data were available regarding the toxicity of dibenzofuran to vegetation, soil invertebrates, mammals, or avian species.

Diethylphthalate. No data were available regarding the toxicity of diethylphthalate to vegetation, soil invertebrates, mammals, or avian species.

Di-n-butylphthalate. Oral LD_{50} values in rats and mice are greater than 20,000 mg/kg-bw. Rat NOAEL and LOAEL values are 125 mg/kg-bw and 600 mg/kg-bw, respectively (Hardin *et al.* 1987). Exposure to such high concentrations to negatively affect rats indicates the low toxicity of this substance. Minimal hepatic and renal effects have been reported to occur due to exposure to 1,000 to 2,600 mg/kg-bw (Oishi and Hiraga 1980). Similar concentrations can significantly affect reproductive systems of female rats (Killinger *et al.* 1988). No data were found regarding the toxicity of di-n-butylphthalate to avian species.

Corn shoots were found to have reduced height and weight when exposed to 2,000 mg/kg di-n-butylphthalate in soils. This concentration resulted in a 17% decrease in height, a 25% decrease in weight, and chlorosis in corn shoots (EPA 1985a). No data were located regarding the effects of di-n-butylphthalate to soil invertebrates.

Di-n-octylphthalate. No data were located regarding the toxicity of di-n-octylphthalate to vegetation, soil invertebrates, mammals, or avian species.

Polycyclic Aromatic Hydrocarbons (PAHs). There are thousands of PAHs, each differing in the number and position of substituted molecules on the benzene ring base.

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Lower molecular weight PAHs are more mobile than the higher weight PAHs which are relatively immobile (Eisler 1987a). PAHs affect a number of target systems and organs including the hematopoietic and lymphoid systems, and the skin, small intestine, kidney, liver, and mammary gland (Eisler 1987a). Survival, growth, metabolism, and tumor formation are also affected by PAHs. There are inter- and intraspecific differences in responses to carcinogenic PAHs, and PAH interactions with other chemicals can alter organism responses (Eisler 1987a).

Acute oral LD_{50} values for small mammals vary from 50 mg/kg-bw for benzo(a)pyrene (rat) (Eisler 1987a) to 1,630 mg/kg-bw for 2-methylnaphthalene to 2,000 mg/kg-bw for flouranthene (rat) (Eisler 1987a). Other LD_{50} values included 120 mg/kgbw for benzo(a)pyrene in mice, which caused death due to reduced bone marrow production (Robinson *et al.* 1975) and rat LD_{50} values for naphthalene from 1,780 mg/kgbw (Eisler 1987a) to 2,200 mg/kg-bw for males and 2,400 mg/kg-bw for females (Gaines 1969). Mouse LD_{50} values were 533 and 710 mg/kg-bw for males and females, respectively (Shopp *et al.* 1984). The only LOAEL found was 120 mg/kg-bw for benzo(a)pyrene (mouse) which is inconsistent with the LD_{50} listed above. The 50 mg/kg-bw LD_{50} for benzo(a)pyrene was chosen for the TBV for this assessment because it is the lowest LOAEL. The NOAELs located varied from 41 mg/kg-bw for naphthalene (rat) (ATSDR 1990a) to 1,000 mg/kg-bw for anthracene (mouse) (IRIS 1992).

Some PAHs, such as benzo(a)pyrene, chrysene, and 7,12-dimethylbenz(a)anthracene, have caused avian embryotoxicity including a reduction in embryonic growth and a significant increase in the percent of anomalies (Eisler 1987a) but specific concentrations relating to these effects were not provided. The LOAEL for mallards was 4,000 ppm in food as evidenced by hepatic stress (Patton and Dieter 1980). This concentration was equal to 407 mg/kg-bw. This was used as the LOAEL for avian species in this ERA for most of the PAHs.

Plants can absorb PAHs from soil through their roots, and translocate them to other plant parts. Uptake is governed by PAH concentration, water solubility, soil type and physicochemical state. Lower molecular weight PAHs were absorbed more readily than higher molecular weight PAHs. PAHs concentrate more in aboveground plant parts than

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underground parts. However, PAH-induced phytotoxic effects are rare (Eisler 1987a). No phytotoxicity values were found for PAHs.

Only one soil invertebrate toxicity concentration was located for PAHs. The LC_{50} for earthworms is 173 mg/kg fluorene in soil (EPA 1985b).

Pesticides and Polychlorinated Biphenyls

4,4'-DDT and its Metabolites (DDTR). Technical DDT is composed of three forms of DDT and trace contaminations of the very closely related breakdown products DDE and DDD (ATSDR 1993a). DDT was the dominant pesticide in the United States from the late 1940s to the 1960s (Herman and Bulger 1979) and is a long-lived, lipid soluble pesticide. DDTR may potentially affect numerous systems including the cardiovascular, hepatic, immunological, developmental, reproductive, and neurological. Toxicity of DDTR to mammals varies greatly from species to species. Rats exposed to 85 mg/kg-bw DDD for 78 weeks developed thyroid adenomas and carcinomas (ATSDR 1993a). In similar studies, 107 and 428 mg/kg-bw of DDD resulted in no systemic effects (NOAEL) in mice. Since carcinomas are not an appropriate endpoint, 428 mg/kg-bw was chosen as the TBV for this assessment.

For DDE, NOAEL concentrations of 23 and 34 mg/kg-bw were located for rats and mice, respectively (ATSDR 1993a). However, a LOAEL of 12 mg/kg-bw introduced orally for 78 weeks resulted in some mortality of rats, indicating that 23 mg/kg-bw for rats may be too high. The LOAEL was chosen as the most appropriate DDE TBV for this assessment.

Listed rat oral LD_{50} values for DDT varied from 113 to 800 mg/kg-bw (ATSDR 1993a). A reported LOAEL value for DDT in rats and guinea pigs was 160 mg/kg-bw, which results in neurological impairments such as tremors and leg paralysis (Hietanen and Vainio 1976). Developmental effects on rabbits include decreased fetus weight in females exposed to 1.0 mg/kg-bw (Fabro *et al.* 1984), and increased fetal resorption at a concentration of 10 mg/kg-bw (Hart *et al.* 1972). Another investigation determined a LOAEL of 0.35 mg/kg-bw which resulted in decreased fertility (ATSDR 1993a). This LOAEL was selected as the TBV for the assessment of effects of DDT to the short-tailed shrew. Some NOAEL

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values were higher than this LOAEL, but they represented less sensitive endpoints and, therefore, were not chosen.

In birds, DDD can lower the reproductive rate by causing eggshell thinning, increased embryo death rates, decreased hatchling survivability and decreased fecundicity (EPA 1993b). Limited toxicity data for birds indicated that an LD_{50} for DDD was 386 mg/kg-bw (HSDB 1994). The only DDE data indicated it less toxic than DDT with LD_{50}s of 39.3 and 96.9 mg/kg-bw for coturnix and bobwhites, respectively (HSDB 1994; Hill and Camardese 1986). Oral LC_{50} values for DDT in California quail converted to 595 mg/kg-bw or more (Hudson *et al.* 1984), but LD_{50} concentrations were as low as 55 mg/kg-bw for pheasants (ATSDR 1993a).

Effects data for vegetation and soil invertebrates were located and are listed in Tables V-21 and V-22, respectively.

Chlordane. Technical grade chlordane is a mixture of over 140 related compounds. Approximately 60% to 85% of the mixture is composed of the cis- and trans-stereoisomers which are also referred to as alpha- and gamma-chlordane, respectively (ATSDR 1992e). Oral LD_{50} values for technical grade chlordane were listed as 335 and 430 mg/kg-bw for male and female rats, respectively (Gaines 1960). An oral LD_{50} value for mice was 145 mg/kg-bw (RTECS 1994). Differences in microsomal enzymes of the liver may be responsible for this interspecific difference (Truhaut *et al.* 1975). A LOAEL in female rats was 6.0 mg/kg-bw based on 80-week oral exposure to gamma-chlordane (ATSDR 1992e). In the same investigation, a LOAEL for alpha-chlordane was 20.4 mg/kg-bw. There were no systemic effects (NOAEL) due to alpha-chlordane in mice fed 8.3 mg/kg-bw for 80 weeks (ATSDR 1992e).

Some LD_{50}s located for avian species ranged from 14.1 to 1,200 mg/kg-bw for California quail and the mallard, respectively (Eisler 1990). These values were used for both alpha- and gamma-chlordane. An LC_{50} value for Japanese quail was listed as 308 ppm (Hill and Camardese 1986) for both alpha- and gamma-chlordane. This converted to 16.2 mg/kg-bw. The LD_{50} of 14.1 mg/kg-bw was chosen as the most representative TBV for avian species. No data were located regarding the toxicity of chlordane to vegetation and soil invertebrates.

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Endosulfan. Technical grade endosulfan contains two isomers, gamma-endosulfan and beta-endosulfan, which occur in a 7:3 ratio, respectively (ATSDR 1992f). Gamma-endosulfan is three times as toxic as beta-endosulfan. Acute oral exposures to lethal or near-lethal endosulfan levels affect a number of organ systems including respiratory, cardiovascular, gastrointestinal, hematological, hepatic, and renal (ATSDR 1992f). The primary target organs of chronic exposures are the liver and kidney.

Oral LD_{50} values vary based on species, gender, specific chemical formulation, and nutritional status of the animal (Gupta and Gupta 1979; WHO 1984). An LD_{50} value for male mice was 7.36 mg/kg-bw (Gupta *et al.* 1981), and the LD_{50} values for male and female rats ranged from 40 to 121 and 10 to 23 mg/kg-bw, respectively (ATSDR 1992f). Dogs acutely exposed to 50 mg/kg-bw experienced congestion in the stomach, small intestine, liver, kidneys, and lungs, and respiratory paralysis (ATSDR 1993g). Increased respirations and hyperactivity were observed in rabbits exposed to 1.8 mg/kg/day for 10 days (ATSDR 1993g). Chronic NOAEL values for female rats and mice were listed as 5 and 2.5 mg/kg-bw, respectively (ATSDR 1993g). No studies were located with toxicity values for avian species or for vegetation and soil invertebrates.

Endrin. Endrin was a pesticide commonly used to control insects and rodents, but it is no longer produced or sold for general use in the United States (ATSDR 1993h). Acute exposure of animals to endrin may cause central nervous system effects including convulsions (Deichmann *et al.* 1970) and nonspecific degeneration of the liver, kidney, and brain (Treon *et al.* 1955). Endrin can also cause abnormal bone formation, hyperactivity, and death in fetuses of dams exposed during gestation (Kavlock *et al.* 1985). Acute oral LD_{50}s were listed as 7.3 and 16.8 mg/kg-bw for 29 to 31 day old and six month old female rats, respectively, and 28.8 and 43.4 mg/kg-bw for 20 to 31 day old and 6 month old male rats, respectively (Treon *et al.*1955). Male and female mice administered 5 ppm of endrin in feed for 120 days had significant mortality (Good and Ware 1969). Mice exposed to endrin at 0.053 mg/kg-bw for 80 weeks did not have any noticeable renal effects (ATSDR 1993h) and rats orally administered 0.25 mg/kg-bw over two years did not exhibit any excess mortality (NOAEL).

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An LC_{50} for mortality in Japanese quail was 17 mg/kg (Hill and Camardese 1986). This converted to approximately 1.2 mg/kg-bw. No toxicity data were available for vegetation or soil invertebrates. The same toxicity values used for endrin were substituted for endrin aldehyde and endrin ketone.

Inorganics

Aluminum. Although aluminum occurs widely in wildlife foods and drinking water, there is little indication that it is toxic via the oral route. Aluminum is fatal to laboratory animals only at relatively high doses (ATSDR 1991a). The oral LD_{50} is 261 mg/kg-bw for rats (Llobet *et al.* 1987) and 770 mg/kg-bw for mice (Ondreicka *et al.* 1966). Aluminum increased mortality in rat pups when given to dams during gestation at 155 mg/kg-bw (Bernuzzi *et al.* 1986). Many of the chronic effects of aluminum in animals are controversial. Some studies show decreased pup growth and neurological development while others do not (ATSDR 1991a). The reproduction of dogs was not affected by 60 mg/kg-bw when given orally for six months and mice were not affected by 19 mg/kg-bw. For this ERA, 19 mg/kg-bw/day was chosen as the NOAEL TBV for small mammals. No avian toxicity data were found for aluminum.

Aluminum is a common constituent of all plants. However, the physiological function of aluminum is not clear. Aluminum toxicity is often reported for plants growing on acid soils. In most plants, the symptoms of aluminum injury first appear in the roots with symptoms including short, stubby, distorted and discolored roots (Parker *et al.* 1989; Kabata-Pendias and Pendias 1992). No specific data were located to quantify the toxicity of aluminum to plants or soil invertebrates.

Antimony. Antimony is a silvery-white metal which occurs naturally in the environment and has no known essential biological functions (Wood and Wang 1985; Puls 1988). Toxicity of antimony is dependent on its valence state; the trivalent form is more toxic than the pentavalent form (Puls 1988).

Acute toxicity (i.e., death) values ranged from 15 mg/kg-bw in rabbits to 600 mg/kg-bw in mice. An acute LD_{50} of 525 for rats was located in ATSDR (1992g). This LD_{50} was

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chosen as the most representative TBV. In lifetime studies with rats, chronic toxicity was observed at a concentration of 0.43 mg/kg-bw in drinking water. The lifespan was decreased, cholesterol levels increased, and serum glucose levels decreased. However, these endpoints were not felt to be appropriate for small wild mammals; therefore, this concentration was not chosen as a TBV.

Antimony is a nonessential element that is easily taken up by plants. Antimony concentrates in both roots and leaves. There were no reports of plant toxicity caused by antimony (Kabata-Pendias and Pendias 1992) and no avian or soil invertebrate toxicity values were located.

Arsenic. Arsenic is a naturally-occurring element which is usually present in the environment combined with oxygen, chlorine, sulphur, carbon, and hydrogen. The principal form in the environment is arsenic trioxide (Eisler 1988b). Organic arsenic compounds are typically less toxic than inorganic forms (ATSDR 1993b).

Single-dose oral LD_{50} values of arsenic in rats ranged from 15 mg/kg-bw (Harrison *et al.* 1958) to 110 mg/kg-bw (Gaines 1960). Eisler (1988b) listed an acute LD_{50} for mice as 39.4 mg/kg-bw. A NOAEL value for the rat cardiovascular system was 2.3 mg/kg-bw (Bekemeier and Hirschelmann 1989), but for the more sensitive reproductive endpoint, the NOAEL was listed as 0.7 mg/kg-bw (ATSDR 1993b). Another NOAEL value of 1.2 mg/kg-bw was reported for respiratory, cardiovascular, gastrointestinal, and hematopoietic systemic effects in dogs (Byron *et al.* 1967).

Oral LD_{50} values for birds include 99.8 mg/kg-bw of copper acetoarsenite for brown-headed cowbirds (NAS 1977), 47.6 mg/kg-bw of sodium arsenite for California quail (Hudson *et al.* 1984), and 323 mg/kg-bw for the mallard (Eisler 1988b). No LOAEL concentrations were found for arsenic. A NOAEL value for nestling northern bobwhites, mockingbirds, and robins was 40 mg/kg-bw of arsenic (NAS 1977); however, for brown-headed cowbirds a NOAEL of 7.32 mg/kg-bw was found and chosen as a TBV for the assessment.

The symptoms of arsenic toxicity include leaf wilting, violet coloration (increased anthocyanin), root discoloration, cell plasmolysis, and growth reduction (Kabata-Pendias and

Pendias 1992). However, no data could be found on specific concentrations responsible for these potential effects. Likewise, no data were located for soil invertebrates.

Barium. Barium occurs naturally either as barium sulfate or barium carbonate. The LD_{50} values for barium range from 200 mg/kg-bw for mouse oral exposure to 418 mg/kg-bw for rat oral exposure (RTECS 1994). Dog, rabbit, and guinea pig LD_{50}s were between these concentrations (RTECS 1994). Of more concern for toxicity are the more soluble, manufactured compounds, barium chloride, barium acetate, barium nitrate, etc. In particular, toxicological study has focused on barium chloride, for which acute oral LD_{50} values can be as low as 70 mg/kg-bw for mice or as high as 277 mg/kg-bw in male rats (RTECS 1994; Borzellaca *et al.* 1988, as cited by ATSDR 1992h). Systemic effects, including respiratory, gastrointestinal, hepatic, and renal, were seen in rats at 198 mg/kg-bw (ATSDR 1992h). Reproductive effects were also noted at this level of exposure. No systemic damage was noted at 66 mg/kg-bw.

The kidney is the primary target for chronic exposure to barium chloride dihydrate, with rats exposed to 2,500 ppm showing nephrotoxicity over a two-year period (NTP 1994). Chronic exposure of rats to 0.7 mg/kg-bw/day barium acetate produced no systemic effects (ATSDR 1992h) and 138 to 140 mg/kg-bw/day was a NOAEL for reproductive and histopathological effects, respectively (ATSDR 1992h; IRIS 1993).

The only avian toxicity value was 16.5 mg/kg-bw in California quail. This concentration resulted in decreased body weight (LOAEL) (NRC 1980).

Barium is commonly found in plants, but is not an essential element. Chaudry *et al.* (1977) found 100 to 200 mg/kg (DW) barium in plants as highly toxic, while Shacklette *et al.* (1978) stated that 220 ppm (DW) is moderately toxic. No concentrations in soil were available in either of these studies to use as toxicity values for comparisons to ASL surface soil stressor concentrations. Additionally, no soil invertebrate toxicity information was found.

Beryllium. The toxicity of beryllium varies according to the compound. For beryllium sulfate, the acute oral LD_{50} values reported were 82 mg/kg-bw to 120 mg/kg-bw for rats and 80 to 140 mg/kg-bw for mice (ATSDR 1993i; RTECS 1994). Similarly,

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beryllium chloride LD_{50} was 86 mg/kg-bw for rats and 92 mg/kg-bw for mice (RTECS 1994). The LD_{50} for beryllium fluoride was as low as 18.8 mg/kg-bw in rats, but this higher toxicity may be due to toxic effects from the fluoride ion.

Young rats fed 121 mg/kg-bw beryllium carbonate developed severely weakened bones (ATSDR 1993i). Chronic exposure of rats to 31 mg/kg-bw beryllium sulfate did not produce a NOAEL over a period of two years (ATSDR 1993i). Other NOAELs were reported for systemic effects at 0.54 and 0.95 mg/kg-bw. No reproductive damage was reported as a result of chronic or acute exposure to beryllium compounds.

Beryllium is easily taken up by plants when it occurs in a soluble form in the soil. Some plant species in the legume and cruciferous families have a pronounced ability to accumulate beryllium. Beryllium concentrates mainly in the roots and common symptoms of toxicity are brown stunted roots and stunted foliage (Kabata-Pendias and Pendias 1992). Relatively low beryllium concentrations ranging from 2 to 16 mg/kg in solution are highly toxic to plants. Levels of 0.5 mg/kg in soil have been shown to result in growth depression to tomatoes (EPA 1985c). No avian or soil invertebrate toxicity values were found.

Cadmium. Cadmium is a relatively rare heavy metal that is not biologically essential or beneficial. Cadmium is a known teratogen and carcinogen for fish and wildlife (Eisler 1985a). The lowest oral doses producing death in rats and guinea pigs ranged from 150 to 250 mg/kg-bw. A small mammal LOAEL of 1.75 mg/kg-bw resulted in histopathological effects in mice (ATSDR 1993c). This value is slightly below the 1.9 mg/kg-bw NOAEL for reproductive effects found in ATSDR (1993c).

Chickens and mallards had suppressed egg laying when fed a diet containing 200 ppm for 90 days (Eisler 1985a). This converted to LOAEL of approximately 11.3 mg/kg-bw using an ingestion rate of 0.063 kg/day and a body weight of 1.14 kg. A NOAEL of 1.7 mg/kg-bw for mallards was found in an investigation by Caine *et al.*(1983). These two values were used as the TBVs for the assessment of effects on the mammalian measurement species due to cadmium.

Plants grown on contaminated soils do not accumulate high amounts of cadmium until the soil cadmium level is very high (Sharma 1980). Cadmium is concentrated in the roots

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and, to a lesser extent, the leaves (Kabata-Pendias and Pendias 1992). Terrestrial plants have been shown to exhibit moderate growth reduction when cultivated in soils heavily contaminated with cadmium but no specific toxicity values were located.

Cadmium is highly accumulated in soil organisms. Earthworms can contain 11 times more cadmium than is present in their surrounding soil (Sharma 1980). An LC_{50} of 757 mg/kg in soil was found to be toxic to earthworms (EPA 1985d). This concentration was used as the soil invertebrate toxicity concentration for this ERA.

Chromium. Chromium is a naturally occurring element present in a number of forms, the most common of which are chromium (0), chromium (III), and chromium (VI). Chromium (III) is the most common form of chromium in the environment. Chromium VI is unstable and only associated with metals production facilities; therefore, chromium III was assumed to be the form present on the undeveloped landfill. Chromium (III) is an essential nutrient to animals and is typically less toxic than chromium (VI) (ATSDR 1993j).

Acute oral LD_{50} values for chromium (III) in rats vary from 2,365 mg/kg-bw for chromium acetate (Smythe *et al.* 1969) to 183 and 200 mg/kg-bw, (Vernot *et al.* 1977) for female and male rats, respectively, exposed to chromium nitrate. For comparison, Cr (VI) LD_{50} values are 13 and 28 mg/kg-bw in female and male rats, respectively (ATSDR 1993j). A concentration of 1,400 mg/kg-bw chromium (III) has been reported to have no adverse effects on various organs and histopathology in rats (Ivankovic and Preussman 1975) and 2,853 mg/kg-bw chromium (III) did not result in systemic effects (ATSDR 1993j). Reproductive effects were observed following seven weeks of exposure to 57 mg/kg-bw chromium (III) (ATSDR 1993j). This LOAEL was selected as the TBV for this ERA.

Adult black ducks fed diets containing 10 or 50 ppm chromium (III) for five months were normal in survival, reproduction, and blood chemistry (Haseltine *et al.* 1985). This dietary concentration was converted to 2.75 mg/kg-bw using an ingestion rate of 0.063 kg/day and a body weight of 1.14 kg and represented the NOAEL used as a TBV for this assessment.

The chromium content in plants in controlled mainly by the soluble chromium content (Cr^{+2}). Usually a higher chromium content is observed in roots than in leaves or shoots, whereas the lowest concentration is in grains. Symptoms of chromium toxicity include

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wilting of tops and root injury, chlorosis, and brownish-red leaves (Kabata-Pendias and Pendias 1992). Corn exhibited a 97% weight decrease after exposure to 320 mg/kg dry weight chromium (III) in soil. No data were located for soil invertebrate toxicity.

Cobalt. Cobalt is a component of Vitamin B12 and, therefore, is an essential element. However, harmful effects may occur when the cobalt concentration is too high (ATSDR 1991b). Oral LD_{50}s for several cobalt compounds have been determined in rats. These values range from 91 mg/kg-bw as cobalt fluoride to 190 mg/kg-bw as cobalt chloride. Cobalt fluoride and cobalt bromide appeared to be the most toxic of the tested cobalt compounds (Speijers *et al.* 1982).

Oral exposure of female rats to cobalt chloride at 5.4 mg/kg/day or 21.8 mg/kg/day (LOAEL) during gestation and lactation resulted in stunted growth and decreased survival, respectively, of the newborn pups (ATSDR 1991b).

Cobalt is essential for microorganisms in nitrogen fixing plants and has a beneficial effect on the growth of legumes. However, excess cobalt can affect plant growth and metabolic functions. Symptoms of cobalt toxicity include white, dead margins and tips of leaves, and interveinal chlorosis of new leaves (Kabata-Pendias and Pendias 1992). No specific toxicity values were found for birds, vegetation, or soil invertebrates.

Copper. Copper is an essential trace element that is widely distributed in animal and plant tissue. Plant uptake of copper can be a source of copper in the food chain. Both Goonerante *et al.* (1980) and Underwood (1977) have shown ruminants, especially sheep, to be sensitive to copper poisoning. Ingestion of 1,500 mg/day (approximately 25 mg/kg-bw) for 30 days was fatal to sheep. Copper concentrates in the liver and kidneys, and the resulting primary effect of copper seems to be hepatic changes. Pathological and toxicological changes included necrosis and sloughing of mucosal of the gizzard, small hemorrhages in the liver, and greenish discoloration of lung tissue (Henderson *et al.* 1974). A LOAEL of 4.2 mg/kg-bw resulted in decreased survivorship, but no effect was seen on fetal mortality at 78 mg/kg-bw (ATSDR 1990c). The LOAEL of 4.2 mg/kg-bw was chosen as the TBV.

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Beck (1961) observed that ducks stored copper in liver tissue more rapidly than other birds, and Canada geese suffered acute toxicosis following ingestion of 600 mg/kg-bw copper sulfate. Mallards exposed to 0.12 mg/kg-bw (NOAEL) for 29 days did not exhibit decreased survivorship (Demayo *et al.* 1982) and turkeys were not affected by 71 mg/kg-bw (Vohra and Kratzer 1968). The NOAEL of 71 mg/kg-bw was the highest NOAEL for avian species and was selected to represent the avian TBV because it is below all reported LOAELs.

Soils with considerable levels of copper exhibit decreased growth of vegetation. Some plant species such as lichens and mosses are very sensitive to copper, and community composition and species diversity changes could occur as a result of the elimination of sensitive species and selection for resistent ones. Grasses generally can accumulate copper at high levels, while tree foliage accumulates lower amounts. Copper is highly toxic to roots, but it is not readily translocated and is found in only trace amounts in stems (Gough *et al.* 1979). The major symptom of copper toxicity in plants is chlorosis (yellowing) of the foliage and wheat exposed to 100 mg/kg dry weight copper sulfate in soil had a 4% decrease in yield.

Soil invertebrates may also be sensitive to copper toxicity. An LC_{50} of 643 mg/kg dry weight copper sulfate in soil was found for earthworms (EPA 1985e).

Cyanide. Cyanide is present in the environment in several forms including free cyanide, metallocyanide and complexes, and synthetic organocyanides. Of these compounds, free cyanide is the primary agent responsible for toxic effects. Cyanide has a low persistence in the environment and is not accumulated or stored in any mammals. Biomagnification in food webs has not been reported due to rapid detoxification of sublethal doses in mammals. Cyanide has a low chronic toxicity and despite repeated exposure to sublethal concentrations, no cumulative effects have been reported. Sublethal doses of cyanide can be tolerated by many mammalian species for a long period of time (Ballantyne and Marrs 1987; Towill *et al.* 1978; EPA 1980a; Way 1984). Domestic and wild ungulates are sensitive to acute poisoning from cyanide in their food. Signs of acute cyanide poisoning from ingestion of 200 mg/kg in the diet include excitability with muscle tremors, salivation, lacrimation, defecation, and labored breathing followed by death (Egekeze and Oehme 1980). The oral LD_{50} was 3.4 mg/kg-bw in mice, 5.8 mg/kg-bw for rabbits, and 5.7 mg/kg-bw for rats (Eisler 1991).

Birds are similar to mammals in that they are sensitive to the acute toxicity of cyanide. Cyanide has a low chronic toxicity in birds. Birds that feed on flesh such as owls, kestrels, and vultures are generally more sensitive to cyanide than are herbivorous birds (Eisler 1991). A notable exception to this generalization is the mallard duck. An acute oral LD_{50} value for mallard was 1.43 mg/kg-bw (Eisler 1991). Other LD_{50}s included 2.54 mg/kg-bw for the black vulture, 4.5 mg/kg-bw for the Japanese quail, and 11.1 mg/kg-bw for the chicken. Dietary levels of 136 mg/kg in food resulted in growth reduction of chicks, but 103 mg/kg (approximately 5.7 mg/kg-bw/day using an ingestion rate of 0.063 kg/day and a body weight of 1.14 kg) in the diet produced no measurable effect in domestic chicken (Eisler 1991).

In higher plants, elevated cyanide concentrations inhibited respiration and adenosine triphosphate (ATP) production (Towill *et al.* 1978). At lower concentrations, cyanide effects include inhibition of germination and growth (Eisler 1991). No specific data were available for vegetation or soil invertebrates.

Iron. Iron is present in a wide variety of compounds in the environment, but the most widely studied toxicologically is iron (II) sulfate. Acute LD_{50} values for this compound vary from 319 mg/kg-bw for rat oral exposure, to 306 mg/kg-bw for mouse, to 1,200 mg/kg-bw for guinea pig (NRC 1980; RTECS 1994). Iron is also a necessary element for most animals, and severe toxic effects can result from iron deficiency. Subchronic oral exposure to 5 mg/day (approximately 10 mg/kg-bw for guinea pigs and 25 mg/kg-bw for rats) iron sulfate for 45 days led to severe toxicity and mortality in guinea pigs and a low growth rate in rats (EPA 1984a). Exposure to 1 mg/day had no effect on either species in the same experiment. This represented a NOAEL value of 2 mg/kg-bw for guinea pigs and 5 mg/kg-bw for rats.

The only avian toxicity value that was found was for turkeys. A 12-week feeding of 29.5 mg/kg-bw resulted in no changes in growth (NOAEL) (NRC 1980).

Iron is essential for the health of plants, and is considered the key metal in energy transformation needed for synthesis. Excessive iron uptake can produce toxic effects in plants. Symptoms of iron toxicity are not specific and usually differ among plant species but injured leaves or necrotic spots on leaves indicate an accumulation of iron above 1,000 parts

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per million (mg/kg) (Kabata-Pendias and Pendias 1992). A concentration of 2,130 mg/kg dry weight in soil did not affect alfalfa grown in the soil (EPA 1985f). No toxicity data were located for soil invertebrates.

Lead. Oral LD_{LO} (lowest dose expected to cause death) varies among species and compounds. Lead acetate orally administered in a concentration of 300 mg/kg-bw to dogs resulted in death, whereas 2,000 mg/kg-bw of lead chloride caused mortality in guinea pigs (Sax 1984). Lead poisoning most notably occurs in the hematopoietic system in which red blood cell malformations occur, leading to severe anemia (USFWS 1986). Reproductive effects (decreased number of pregnancies) in mice and rats were observed at a lead concentration of 390 mg/kg/day, and the NOAEL in this study was 39 mg/kg/day (Kennedy *et al.* 1975). This was the highest NOAEL located for lead and was used as the mammalian TBV.

Negative effects of lead on avifauna have also been documented. Mallards exposed to lead as 0.5% and 4.5% (275 and 2475 mg/kg-bw/day using an ingestion rate of 0.063 kg/day and a body weight of 1.14 kg) of their diets showed decreased amino-levulinic acid dehydratase (ALAD) enzyme activity in red blood cells by 50%, and 85% to 90%, respectively (Eastin *et al.* 1983). American kestrel chicks fed 625 mg/kg-bw experienced 40% mortality after six days, and decreased brain weight was observed in chicks exposed to 125 mg/kg (Hoffman *et al.* 1985). Herring gulls and puffins orally treated with 10 to 20 mg/kg exhibited anemia in four to five days (Leighton *et al.* 1983). Kestrels fed pine voles containing lead residues of 38 mg/kg from pesticide-treated orchards accumulated 1 mg/kg of lead in their livers (Eisler 1988a). Some NOAELs for kestrels ranged from 5.1 mg/kg-bw to 28 mg/kg-bw. This highest NOAEL is below all reported LOAEL values and was chosen as the TBV for the assessment of risks to avian species due to lead.

Absorbed lead inhibits respiration and photosynthesis in plants at very low tissue concentrations. However, lead poisoning in plants is seldom observed under field conditions (Kabata-Pendias and Pendias 1992). In some plant species, lead-resistant populations have been found to tolerate extremely high soil and tissue levels of lead. High levels of lead in soil limits the biological activity of microbes and slows the decomposition of organic matter. This can have an important ecological effect on nutrient cycling if large land areas are affected. A

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dry weight concentration of 100 mg/kg lead in soils resulted in significant effects to some vegetation (Kabata-Pendias and Pendias 1992).

The effects of lead on soil invertebrates have not been widely studied. Some soil invertebrates, such as earthworms and woodlice, accumulate lead from soils. However, lead bioaccumulation factors of less than 1 have been reported for earthworms (Beyer *et al.* 1982) and for woodlice (Hopkins *et al.* 1986). Earthworms are fairly resistant to toxic effects of lead with an LC_{50} of 5,941 mg/kg dry weight in soil (EPA 1985g).

Manganese. Manganese is an essential element for plants and animals, and is a cofactor for a number of enzymatic reactions. The divalent form of manganese, which is the more prevalent form of manganese in the environment, has a low order of toxicity to living organisms. In mammals, very large doses of ingested manganese can cause liver, lung, and central nervous system damage. Symptoms of toxicity in mammals include reduced appetite, lethargy, reduced weight, stiffness, and anemia. In animals, most studies indicate that manganese compounds have a low acute oral toxicity. The average LD_{50} values for rodents ranged from 400 to 830 mg/kg bw of soluble manganese (EPA 1984b). However, daily oral doses of 930 mg/kg-bw did not cause significant mortality in rats until after 16 months of exposure, and chronic exposure of mice to 810 mg/kg-bw did not cause increased mortality within 24 months (Hejtmancik *et al.* 1987). A slight decrease in pregnancy rate (LOAEL) was observed in rats exposed to 3,500 mg/kg (approximately 175 mg/kg-bw using an ingestion rate of 0.0175 kg/day and a body weight of 0.035 kg) in the diet for 90 to 100 days prior to breeding. However, this exposure regimen did not have significant effects on litter size, ovulations, resorptions, or fetal weights (Laskey *et al.* 1982). At approximately 2,000 ppm manganese in food (100 mg/kg-bw/day), significant adverse effects were observed. These and higher levels of manganese caused increased mortality, decreased levels of hemoglobin, and reduced growth.

In a 240-day study with turkeys, growth and reproduction were normal (NOAEL) with 4,990 ppm (approximately 140 mg/kg-bw based on an ingestion rate of 0.372 kg/day and a body weight of 13.2 kg [EPA 1988]) in food, and only growth was adversely affected at 9,980 ppm (approximately 280 mg/kg-bw/day) (Vohra and Kratzer 1968).

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Toxicity in plants is related to the concentration of soluble manganese and acidity of soil. Plant species range greatly in their tolerance of excess manganese, and no specific toxicity concentrations were located for vegetation or soil invertebrates.

Mercury. Mercury exists in a variety of compounds, the most toxic of which is methylmercury, due in part to its ability to easily penetrate cell membranes (Beijer and Jernalov 1979). In both mammals and birds, mercury adversely affects growth, development, hematopoietic and reproductive systems, and behavior, the latter principally via the neurological system (Eisler 1987b). In addition, mercury is teratogenic, mutagenic, and carcinogenic (Eisler 1987b). A single dose oral LD_{50} value of 17.88 mg/kg-bw was reported for mule deer (Hudson *et al.* 1984). Initial signs of mercury toxicity to smaller mammals ranges from 0.1 to 0.7 mg/kg-bw. Mice exposed to 0.42 mg/kg-bw did not exhibit any immunological effects (NOAEL), but exposure to 0.7 mg/kg-bw during gestation resulted in some embryolethality (LOAEL) (Suzuki 1979). One hundred percent of mink fed 1.0 mg/kg-bw/day of mercury died within two months (Sheffy and St. Amant 1982).

Oral LD_{50} values for mallards ranged from 2.2 mg/kg-bw for methylmercury to 524.7 mg/kg-bw for phenylmercury (Eisler 1987b). The LD_{50} for Japanese quail was found to be 500 mg/kg-bw. In general, the range of acute oral toxicity of various mercury compounds is 2.2 to 31.0 mg/kg-bw for most species of avifauna (Eisler 1987b) and was found to be 2.55 mg/kg-bw for the house sparrow (Eisler 1987b). A chronic LOAEL for mallards was 0.064 mg/kg-bw (EPA 1983).

In soils, mercury may be bound to organic matter and soil particles, reducing availability, but mercury compounds can be taken up by plant roots. To a limited extent, mercury can be translocated to the shoots, but generally accumulates in the root system. Mercury is highly toxic to fungi and plants. Excessive levels adversely affect biochemical and physiological plant processes including reduction of protein synthesis in leaves and inhibition of water absorption and transport (Adriano 1986). Phytotoxicity has been shown to occur at mercury soil concentrations of 0.003 mg/kg dry weight for tomatoes, resulting in nearly a 10% reduction in growth. No mercury toxicity data were located for soil invertebrates.

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Nickel. Nickel is relatively nontoxic to birds and mammals. Dogs and cats tolerated daily doses of 4 to 12 mg/kg-bw for 200 days with no effect. Rats administered 250 to 1,000 mg/kg (approximately 75 mg/kg-bw based on an ingestion rate of 0.026 kg/day and a body weight of 0.350 kg) for eight weeks also exhibited no effects. Other rats administered 25 and 50 mg/kg-bw had decreased body weight (LOAEL) and a decreased number of offspring (LOAEL), respectively (ATSDR 1991c). A rat NOAEL of 5 mg/kg-bw was also given in ATSDR (1991c). The NOAEL of 5 mg/kg-bw and the LOAEL of 25 mg/kg-bw were chosen as the small mammal TBVs for this assessment.

Survivorship was not reduced in Japanese quail at a dose of 67.2 mg/kg-bw and the highest NOAEL was 713 mg/kg-bw) (Hill and Camardese 1986). No other studies were located for mercury.

Nickel is readily and rapidly taken up by plants from soils, and the adsorption is positively correlated with nickel soil concentrations (Kabata-Pendias and Pendias 1992). In plants, relatively low concentrations of nickel in tissue are toxic. In general, at concentrations in vegetative tissue above 50 mg/kg dry weight in soil, plants may exhibit symptoms of toxicity such as leaf mottling, chlorosis, and necrosis (Adriano 1986). A great deal of phytotoxicity data were found for nickel. The concentration of 40 mg/kg dry weight in soil resulted in 34% reduction in the yield of lettuce (EPA 1985h) and was chosen as the most important value for comparisons to the site-specific soil concentrations of nickel on the undeveloped landfill.

Toxicity data for earthworms were also found for nickel. An LC_{50} of 757 mg/kg dry weight in soil was chosen for this assessment (EPA 1985h).

Silver. The most significant forms of silver in toxicology are in the +1 valence state, particularly silver nitrate and elemental silver. Acute oral toxicity of silver nitrate varies widely by species, with an LD_{50} value for dogs of 20 mg/kg-bw and a LD_{LO} value of 800 mg/kg-bw for rabbits (RTECS 1994). An LD_{50} for mice was 50 mg/kg-bw, while an LD_{50} of 222 mg/kg-bw was found for rats (RTECS 1994; ATSDR 1990d). A mouse LOAEL of 18.1 mg/kg-bw resulted in hyperactivity after 125 days of exposure (ATSDR 1990d). This LOAEL was used as the TBV in the assessment because the hyperactivity

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endpoint is a more sensitive indicator of potential effects than mortality which was the endpoint for the highest NOAEL of 181.2 mg/kg-bw (ATSDR 1990d). Silver has not been observed to have chronic or acute effects on any other major systems, including reproduction.

Silver uptake by plants is related to soil concentrations. Elevated silver levels may accumulate in plants growing in soils enriched with silver. Little is known about silver toxicity to plants. Wallace *et al.* wrote that about 5 ppm silver in aboveground portions and 1,500 ppm in the roots of bush beans (DW) greatly reduced yield, but the plants grew without symptoms of toxicity. No soil concentration toxicity data were available for predicting the phytotoxic effects of silver. No avian or soil invertebrate toxicity data were found.

Thallium. Thallium is a trace metal widely distributed in the earth's crust. It exists in two chemical states: thallous (+2) and thallic (+3). The thallous state is the more common and stable form (ATSDR 1991d).

The lowest oral doses of thallium compounds showing lethality ranged from 12 (guinea pig) to 29 (rat) mg/kg-bw for thallium acetate and 5 (guinea pig) to 30 (dog) mg/kg-bw thallic oxide (Downs *et al.* 1960). Subchronic exposure has caused reproductive effects. Abnormalities in testicular morphology, function, or biochemistry were evident in rats which received an average daily intake of 0.7 mg/kg-bw (LOAEL) thallium sulfate during a 60-day treatment period (Formigli *et al.* 1986). Hair loss was observed in rats exposed to 1.2 mg/kg/day of thallium acetate for 15 weeks (Downs *et al.* 1960). A NOAEL of 0.25 mg/kg-bw was found in IRIS (1994) for systemic effects.

Only one toxicity value was found for avian exposure to thallium. An acute oral LD_{50} of 34.6 to 56 mg/kg-bw for starlings was determined by HSDB 1994.

The thallium content of plants seems to be a function of the thallium concentration in soils. Increased thallium levels in plant tissues are highly toxic to both plants and animals. The concentration of 5 ppm thallium in the soil solution decreased by 50% the length of roots of collards and wheat, with no visual symptoms of thallium toxicity (Kabata-Pendias and Pendias 1992). No soil invertebrate toxicity data were located for thallium.

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Vanadium. Vanadium is a trace metal widely distributed in the earth's crust and is found in fuel oils and coal (ATSDR 1992i). Little information is available on the toxicity of vanadium to animals. Acute oral LD_{50s} for rats and mice were 41 mg/kg-bw (sodium meta-vanadate) and 31.2 mg/kg-bw, respectively (Llobet and Domingo 1984). Embryonic and systemic effects were observed at 37.5 mg/kg-bw and 5 mg/kg-bw (LOAEL) (WHO 1988) (ATSDR 1992i) respectively, during an 18-day investigation. Effects were found at 5 mg/kg-bw. Chronic exposures of 4.1 mg/kg-bw as vandyl sulfate in food or water did not cause mortality in rats or mice (Schroeder and Valassa 1967). No systemic effects were observed in rats or mice chronically exposed to 0.7 mg/kg-bw in drinking water (Schroeder *et al.* 1970; Schroeder and Mitchner 1975). No toxicity values were found for avifauna.

Vanadium is known to stimulate photosynthesis in plants, but it is not known conclusively if this is an essential element. Soluble soil vanadium appears to be easily taken up by the roots, and some plant species show a great ability to accumulate this metal (Kabata-Pendias and Pendias 1992). Gough *et al.* (1979) reported vanadium concentrations as high as 0.5 ppm in the nutrient solution, and 140 mg/kg dry weight in the soil may be toxic to plants. Symptoms of phytotoxicity include reduced root length, chlorosis, and dwarfing (Kabata-Pendias and Pendias 1992). No soil invertebrate toxicity data were found.

Zinc. Zinc is a nutrient essential for the growth and development of all living organisms. For this reason, organisms have evolved mechanisms to accumulate zinc from water and food. While many organisms can tolerate greater amounts of zinc than are needed for optimum performance, a sufficiently high excess could yield adverse effects. The primary effect of toxic zinc levels are on zinc-dependent enzymes that regulate biosynthesis and catabolic rates of RNA and DNA (Eisler 1993). Zinc-specific sites of accumulation in birds are the liver, kidney, and bones; and sites of accumulation in mammals are serum, pancreas, feces, liver, kidney, and bones. There is both high interspecific differences in zinc concentrations in tissue, and high intraspecific differences due to age, size, sex, and seasons (Eisler 1993). Rat and mouse acute oral LD_{50} values range from 237 and 86 mg/kg-bw to 623 and 337 mg/kg-bw, respectively, for zinc sulfate dihydrate and zinc acetate dihydrate (Domino *et al.* 1988). An LD_{50} for ferrets orally exposed to zinc oxide was 390 mg/kg-bw (Straube

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et al. 1980). Rats suffered hepatic and renal disorders following three months exposure to 191 mg/kg-bw (LOAEL) in the form of zinc acetate (Llobet *et al.* 1988). Female rats experience a NOAEL for zinc acetate of 160 mg/kg-bw (Llobet *et al.* 1988) and no anemia (NOAEL) was found when mice were exposed to 16.3 mg/kg-bw (ATSDR 1992c).

A LOAEL of 4,375 mg/kg-bw was found for chickens. The result was an induced molting (Puls 1988). Mallards fed 3,000 mg/kg-bw zinc for 30 days had leg paralysis, and deaths occurred in individuals rationed greater than 3,000 mg/kg-bw (NAS 1979). Eighteen-month old male mallards fed 495 mg/kg bw suffered 20% mortality within 30 days, and evidence of zinc poisoning was observed in 83% of the survivors (Grandy *et al.* 1968). Turkeys, administered 210 mg/kg-bw/day experienced mortality and growth depression (LOAEL) (Vohra and Kratzer 1968).

Terrestrial plants tend to take up 1% to 3% of zinc added to soil (CH2M Hill 1986). Most plant species are relatively tolerant to excessive amounts of zinc. Symptoms of zinc toxicity include stunted growth, reduced yields, reduced leaf size, necrosis of leaf-tips, and curled distorted foliage. Zinc concentrations of 0.43% to 10.16% in acidic soil were found to be toxic to several vegetable crops (Gough *et al.* 1979). Excessive levels of zinc retard growth in plants by inhibiting root development through restraint both on cell division and elongation.

A zinc concentration of 100 mg/kg in culture medium is lethal to seedlings of red maple and oaks (Buchaner 1971). Photosynthesis in lichens (*Cladonia uncialis*) is negatively affected by zinc concentrations greater than 178 mg/kg dry weight in lichen tissue (Nash 1975). High soil zinc levels (i.e., >20 g/kg) result in decreased populations of soil arthropods, and contaminated forest soil litter with 1,600 mg/kg had significantly lower populations of saprophytes such as wood lice (*Porcellio scaber*) (Beyer and Anderson 1985).

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U.2.3.2.2 Safety Factors

Toxicity data for wild, free-ranging wildlife are not as complete as those found for laboratory or domestic test species. Therefore, toxicity data from laboratory or domestic animal studies are used to obtain TRVs for measurement species. An additional source of uncertainty includes extrapolation from acute or subchronic exposure doses to chronic doses. Because of the uncertainty associated with these extrapolations, safety factors were applied to the TBVs to derive TRVs in an effort not to underestimate risks. The approach taken to derive TRVs for this assessment is provided in Table V-23.

For those SOPCs for which only acute lethality values (e.g., LD_{50}) were available, TRVs were derived by dividing the acute toxicity value by the appropriate safety factors (EPA 1994a). By dividing by a safety factor of 10, the LD_{50} was extrapolated to a value representative of an acute, subchronic, or chronic toxicity threshold (LOAEL). In the case of acute, subchronic, or chronic LOAELs, which would be expected to lie between an LD_{50} and a chronic NOAEL, a conservative safety factor of 10 was also used to extrapolate to a chronic NOAEL. This procedure results in an overall safety factor of 100 to extrapolate from an LD_{50} to a chronic NOAEL. Phylogenetic differences between the test species and the measurement species were not accounted for in this process (EPA 1994a). Table V-23 presents the safety factors used to extrapolate each TBV to a TRV.

U.2.3.2.3 Toxicity Reference Values

TRVs for measurement species at the site are presented in Table V-24. Ingestion toxicity data were unavailable for the shrew, so common laboratory rodent data were extrapolated to calculate TRVs. The TRVs from the Phase II ERA were also included in Table V-24 to avoid repetition of tables in Phase II.

Avian toxicity data are less complete than mammalian toxicity data. Species-specific toxicity data for the robin and kestrel were unavailable for most of the SOPCs. Robin and kestrel TRVs were extrapolated from other available avian studies.

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U.2.4 RISK CHARACTERIZATION

In this section, potential ecological risks posed by SOPCs in ESI undeveloped landfill surface soil samples are briefly identified and summarized. Potential risks to site-associated wildlife presented in the Phase I ERA are used in the Phase II ERA for a weight-of-evidence approach and are not discussed in detail in this section. The Phase II ERA discusses, in detail, potential risks to undeveloped landfill measurement species and communities and utilizes the general conclusions presented here to support the results. Risk characterization involves two major steps, risk estimation and risk description (EPA 1992a), as described below.

U.2.4.1 Risk Estimation

The HQ method was used to assess potential ecological impacts to measurement species and measurement communities. This method compares exposure doses and/or undeveloped landfill surface soil concentrations to TRVs and/or experimentally derived RBSCs, respectively, to yield an HQ. The derivation of the HQ is expressed in the following equations:

$$HQ = EE_{total}/TRV$$

Where:

HQ = Hazard quotient

EE_{total} = Total estimated daily exposure to SOPCs (mg/kg bw/day)

TRV = Toxicity reference value (mg/kg bw/day)

Soil Concentrations

$$HQ = C_{soil}/TRV_{soil}$$

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Where:

C_{soil} = Concentrations of SOPCs in undeveloped landfill surface soil (mg/kg)

TRV_{soil} = Experimental RBSCs that elicit adverse effects on measurement communities (mg/kg)

It is important to note that the method used to estimate risk in this assessment does not measure and cannot be used to determine probabilistic risk. That is, it does not predict the relative likelihood of the occurrence of adverse effects. If the HQ exceeds 1 for a particular SOPC, it indicates that the measurement species may be at risk to an adverse effect from that surface soil SOPC through that exposure pathway. Because TRVs for measurement species in the Phase I ERA incorporated safety factors and conservative exposure parameters (i.e., minimum body weights and maximum ingestion rates), total estimated risk predicted for these species may be overestimated. Therefore, if an HQ is greater than 1, it does not necessarily indicate that an adverse effect will occur. The following is a discussion of the potential risks posed to terrestrial wildlife by SOPCs in undeveloped landfill surface soil.

U.2.4.1.1 Potential Risks to Terrestrial Measurement Communities

Comparisons of SOPC concentrations in undeveloped landfill surface soil samples with literature-derived RBSCs are presented in Tables V-22 and V-23 for vegetation and soil macroinvertebrates, respectively. RBSCs, in the context of these two measurement communities, represent soil concentrations at which no adverse effects have been observed (NOAEL). In cases where NOAEL soil concentrations were unavailable, LOAEL soil concentrations were utilized. Tables V-21 and V-22 provide ratios of the number of samples which exceeded RBSCs out of the total number of samples analyzed for particular SOPCs. The following subsections present a discussion of the potential risks to terrestrial measurement communities from exposure to SOPCs in ESI undeveloped landfill surface soil samples.

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Potential Risks to Terrestrial Vegetation

Potential risks to undeveloped landfill vegetation were estimated by comparing undeveloped landfill surface soil concentrations to published phytotoxicity data (RBSCs). RBSCs were exceeded only by inorganic SOPCs. Of those inorganic SOPCs for which phytotoxicity data were available, all but one exceeded the respective RBSC. Inorganic SOPCs which exceeded RBSCs include: arsenic, beryllium, cadmium, copper, iron, lead, mercury, nickel, and zinc. Of these, iron, lead, mercury, and zinc exceeded their respective RBSCs by the greatest frequency and magnitude.

Potential Risks to Terrestrial Soil Macroinvertebrates

Potential risks to undeveloped landfill soil macroinvertebrate species were estimated by comparing undeveloped landfill surface soil concentrations to published soil invertebrate toxicity data (RBSCs). Copper, nickel, and zinc were the only SOPCs that exceeded soil macroinvertebrate RBSCs.

U.2.4.1.2 Potential Risks to Terrestrial Measurement Species

Potential risks to terrestrial measurement species were estimated by comparing species-specific modeled exposure doses to appropriate TRVs. The total HQ (e.g., the sum of HQs across all potential pathways for a selected measurement species and SOPC) based on the NOAEL TRV for each SOPC was used as a conservative benchmark for the evaluation of potential adverse effects to measurement species. An HQ greater than 1 for a measurement species would be considered presumptive evidence for a potential risk of adverse chronic effects of an SOPC on that given ecological receptor. Potential risks to that ecological receptor would, in turn, represent potential risks to species within the same functional group (see Section U.2.2.7).

The estimated exposures were derived in the exposure assessment (see Section U.2.3.1) and were based on the maximum concentrations of undeveloped landfill surface soil SOPCs. TRVs were derived in the ecological effects assessment (see Section U.2.3.2).

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Potential Risks to the Shrew

Potential risks to the shrew from exposure to undeveloped landfill surface soil was estimated by comparing the estimated daily doses of SOPCs with TRVs derived for the shrew. Table V-25 presents calculated HQs for the shrew. The ingestion of contaminated earthworms and surface soil resulted in total HQs greater than one for benzo(a)pyrene and several inorganic SOPCs. The total HQs which were greater than one are presented in order of decreasing total HQ as follows: iron (HQ = 3,680), copper (HQ = 495), aluminum (HQ = 151), cadmium (HQ = 103), zinc (HQ = 26), vanadium (HQ = 12), lead (HQ = 8), cobalt (HQ = 7), manganese (HQ = 5), nickel (HQ = 1.6), mercury (HQ = 1.5), arsenic (HQ = 1), benzo(a)pyrene (HQ = 1), and chromium (HQ = 1). Therefore, based on the total HQ, those SOPCs which exceeded one by the greatest magnitude are: iron, copper, aluminum, cadmium, zinc, vanadium, lead, cobalt, manganese, nickel, mercury, arsenic, benzo(a)pyrene, and chromium.

Potential Risks to the Robin

Potential risks to the robin from exposure to undeveloped landfill surface soil was estimated by comparing the estimated daily doses of SOPCs with TRVs derived for the robin. Table V-26 presents calculated HQs for the robin. The ingestion of contaminated earthworms, fruit, and soil resulted in total HQs greater than one for several inorganic SOPCs. Inorganic SOPCs with total HQs greater than one are presented in order of decreasing total HQ as follows: aluminum (HQ = 3,070), iron (HQ = 506), barium (HQ = 71), mercury (HQ = 38), zinc (HQ = 22), lead (HQ = 13), cadmium (HQ = 12), copper (HQ = 6), and chromium (HQ = 2). Therefore, based on the total HQ, those SOPCs which exceeded one by the greatest magnitude are: aluminum, iron, barium, mercury, zinc, lead, cadmium, copper, chromium.

Potential Risks to the Kestrel

Potential risks to the kestrel from exposure to SOPCs was estimated by comparing the estimated daily doses of SOPCs with TRVs derived for the kestrel. Table V-27 presents calculated HQs for the kestrel. The ingestion of contaminated prey (shrew and robin tissue)

resulted in total HQs greater than one for several inorganic SOPCs. Inorganic SOPCs with total HQs greater than one are presented in order of decreasing total HQ as follows: aluminum (HQ = 273), iron (HQ = 92), barium (HQ = 13) and mercury (HQ = 11). Therefore, based on the total HQ, those SOPCs which exceeded one by the greatest magnitude are: aluminum, barium, iron, and mercury.

U.2.4.1.3 Estimation of Risk-Based Soil Concentrations

For comparison to Phase II data, conservative exposure parameters and ecological effects data were used to calculate site-specific and chemical-specific RBSCs for the undeveloped landfill measurement species. The calculated RBSCs are concentrations of SOPCs in undeveloped landfill surface soil that correspond to a total HQ of one for a particular surface soil SOPC and measurement species. The derivation of RBSCs is expressed in the following equation:

$$RBSC = C_{soil}/THQ$$

Where:

C_{soil} = Concentrations of SOPCs in undeveloped landfill surface soil (mg/kg).

THQ = SOPC total hazard quotient for a particular SOPC and a selected receptor = 1.

A linear relationship exists between the soil SOPC concentration and the total HQ. So, as the soil concentration of an SOPC increases, the total HQ for that SOPC increases proportionally. Because the relationship between the two is linear, the ratio of soil concentration to total HQ will always be constant. The RBSC is developed from this ratio, so it is not dependent upon the soil concentration but rather upon the exposure model assumptions and ecological effects data selected for each SOPC and measurement species. Therefore, if similar exposure parameters and ecological effects data are used, RBSCs developed during the Phase I ERA can be utilized for evaluating RRII surface soil data in the Phase II ERA regardless of

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differing soil concentrations. Table V-28 presents the RBSCs for each measurement species and SOPC detected during the ESI.

U.2.4.2 Risk Description

Risk description involves summarizing potential risks and uncertainties associated with the ERA. In addition, the ecological significance of the potential risks is discussed given the uncertainties associated with the methods used in the Phase I ERA.

U.2.4.2.1 Summary of Risks

The hypothesis presented in the focused ecological conceptual site model (Section U.2.2.8) was confirmed during this Phase I ERA. There is a potential for adverse effects to terrestrial vegetation, soil macroinvertebrates, and mammalian and avian receptors from surface soil contamination on the undeveloped landfill. Benzo(a)pyrene and several inorganic SOPCs represent the source of potential ecological risks to those undeveloped landfill measurement species and communities which were selected for evaluation, namely terrestrial vegetation, soil macroinvertebrates, the shrew, the robin, and the kestrel. SOPCs responsible for the majority of the potential risk were aluminum, barium, cadmium, copper, iron, lead, mercury, nickel, vanadium, and zinc.

U.2.4.2.2 Summary of Uncertainties

An ERA is subject to a wide variety of uncertainties. Virtually every step in the risk assessment process involves assumptions, which contribute to the total uncertainty in the final evaluation of risk. Uncertainties associated with the Phase I ERA include the following:

- A total of four ESI surface soil samples were collected from the undeveloped landfill. These four samples were biased in that they were collected from areas of "expected" soil contamination. The limited number of samples and the biased sampling methods must be considered in the assessment of any potential risks. Due to the extensive area that the undeveloped landfill encompasses (~ 40 acres) and the limited number of samples collected, potential hot

spots may not have been discovered even though the four ESI surface soil samples were biased toward areas of suspected contamination. Therefore, it is unclear whether potential risks to undeveloped landfill receptors are over- or underestimated using these samples.

- Undeveloped landfill SOPCs were not screened against local background concentrations in the Phase I ERA. Therefore, no SOPCs were removed from the assessment and more SOPCs were included for evaluation. The result is an overestimation of potential risks to undeveloped landfill receptors.

- Exposure parameters for all measurement species were selected based on best professional judgement. The amount of food consumed on a daily basis, the different types of food consumed, and the percentage of the whole diet that each food item contributes is estimated based on a combination of information from scientific literature and limited field observation. Also, the amount of time spent foraging on-site was estimated using similar information. Without extensive site-specific field data, it is unclear whether potential risks are underestimated or overestimated using the selected exposure parameters.

- Ingestion rates for all measurement species were converted to a dry-weight basis for use in the ecological exposure model. In order to convert these ingestion rates, assumptions were made regarding moisture content of food items for measurement. It is unclear whether these assumptions led to an overestimation or underestimation of potential risks to undeveloped landfill species.

- For the shrew and the robin, exposure through incidental ingestion of surface soil accounted for a significant portion of the estimated risk for these species. Species-specific soil ingestion rates were unavailable for the shrew and the robin. It was assumed that these two receptors ingested soil at 10.4% of their daily dietary intake while foraging. This assumption is likely to overestimate potential risks from soil ingestion for these species.

- The modeled approach used to estimate contaminant concentrations in vegetation, shrew, and robin tissue is a major source of uncertainty. Plant uptake factors and small mammal and bird bioaccumulation factors were derived from data reported in the scientific literature. These uptake and accumulation factors are likely correlated with site-specific variables such as soil type, soil chemistry, and wildlife

species. It is unclear whether the application of these literature-derived values overestimates or underestimates potential risks to undeveloped landfill receptors.

- Frequently, data from literature sources were not specific to the target receptors and, therefore, extrapolation of the data to the species of concern was necessary. Differences in sensitivity between species to SOPCs are well documented, even among species of the same genus. Since toxicity data were unavailable for the shrew and the robin, all values came from laboratory species (rat, mouse, Japanese quail, California quail, bobwhite quail, chicken, turkey, mallard, ringneck pheasant, and American kestrel). Phylogenetic differences between the test species were not addressed in this assessment. Actual risk may therefore be overestimated or underestimated.

- Safety factors were applied to normalize toxicological data to chronic NOAELs. These safety factors were used as instructed by EPA Region 6. There is considerable uncertainty associated with their application but the desired result is a conservative estimate of the NOAEL. This should result in a conservative estimates of potential risks.

- Toxicity benchmark values were not found for several SOPCs. This will result in an underestimation of potential risks to undeveloped landfill species.

- Most of the available toxicity values were determined with laboratory animals under laboratory conditions. These conditions may not accurately depict the effects of similar dosages on wild free-ranging wildlife.

- Toxicity benchmark values determined with indirect effect measures such as increased/decreased body weight, may not represent other significant indirect effects such as behavioral changes which may be realized in wild populations.

- Suitable phytotoxicity and soil macroinvertebrate information was very limited. In cases where data were available, the lowest reported concentration of an SOPC that elicited an adverse effect was selected. This value was specific for the species tested and may not be representative of species found on the undeveloped landfill.

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The approach taken was to apply realistic or conservative assumptions, and, as a consequence, potential ecological risks to undeveloped landfill species are more likely to be overestimated than underestimated.

U.2.4.2.3 Ecological Significance

The ecological significance of potential risks to undeveloped landfill measurement species and communities was not evaluated in the Phase I ERA. Potential risks associated with ESI surface soil data (in the Phase I ERA) are not necessarily representative of current conditions at the undeveloped landfill because the data were collected in 1993. The Phase II ERA utilizes current (1994) sampling data, as well as information presented in the Phase I ERA, to determine potential risks to the selected undeveloped landfill measurement species and communities.

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Street Residence)

ES102
Approx. 1.45 Miles NW
(Gregory School)

ES154 ES158 ES173 ES111 ES171 ES172 ES116 ES149 ES155 ES181 ES165 ES169 ES104 ES123 ES135 ES147 ES132 ES136 ES157 ES110 ES121 ES166 ES112 ES126 ES109 ES175 ES168 ES128 ES139 ES160 ES167 ES107 ES117 ES170 ES118 ES130 ES174 ES129 ES143 ES120 ES142 ES162 ES105 ES125 ES133 ES140 ES134 ES152 ES119 ES138 ES144 ES150 ES114 ES151 ES122 ES137 ES163 ES108 ES141 ES159 ES127 ES148 ES106 ES146 ES124 ES164 ES145 ES115 ES103 ES153 ES156

ES101
Approx. 900 Feet S.
(Lockett School)

N

LEGEND

- Building
- Canal
- Fence
- Railroad
- Landfill Boundary

KEY

- ESI Sample Location

0 125 250 375 500 625 750
Feet

Figure U-2. ESI SAMPLE LOCATIONS

U.3 PHASE II ECOLOGICAL RISK ASSESSMENT

U.3.1 INTRODUCTION

Using exposure models, TRVs, and RBSCs developed during the Phase I ERA along with surface soil, surface water, and sediment data collected during the RRII, a Phase II ERA was performed for the undeveloped landfill. The purpose of the Phase II ERA was to evaluate the potential for adverse effects to undeveloped landfill-associated wildlife from exposure to SOPCs in undeveloped landfill surface soil and in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment. Because data from the RRII were used for the Phase II ERA, this phase of the assessment evaluated potential ecological risks considered representative of current site conditions.

U.3.1.1 Objectives

The primary objective of the Phase II ERA was to identify and estimate potential ecological risks to terrestrial and aquatic wildlife that inhabit or potentially utilize the site and adjacent canals. Potential ecological risks may result from potential exposure to SOPCs in undeveloped landfill surface soil and/or Florida Avenue Canal and Peoples Avenue Canal surface water and sediment. Secondary objectives included:

- Determining SOPCs in undeveloped landfill surface soil and in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment; and
- Determining RBSCs for SOPCs identified in undeveloped landfill surface soil during the Phase II ERA that were not previously evaluated during the Phase I ERA, and risk-based concentrations (RBCs)

for SOPCs identified in surface water and sediment in the Florida Avenue Canal and Peoples Avenue Canal.

U.3.1.2 Scope

In the Phase II ERA, potential ecological risks were more accurately defined, using RRII surface soil data and exposure models based on average exposure parameters. RRII surface soil data are considered representative of current conditions at the site. In addition, measurement species and TRVs developed during Phase I were utilized for the Phase II ERA. Conservative receptor-specific RBSCs, calculated for undeveloped landfill surface soil during the Phase I ERA, were compared directly to maximum soil concentrations measured during the RRII to generate a list of potential SOPCs. Once potential SOPCs were identified, potential risks to site-associated wildlife were assessed by comparing estimated exposure doses to TRVs. By reference, sections of the Phase II ERA utilize Phase I exposure and toxicity information (see Sections U.2.3.1.2 through U.2.3.2).

In addition to evaluating potential adverse effects to terrestrial wildlife on the undeveloped landfill, potential adverse effects to aquatic and/or semi-aquatic wildlife that potentially inhabit or utilize the Florida Avenue Canal and Peoples Avenue Canal were estimated by evaluating surface water and sediment data collected from these canals. General conclusions about the undeveloped landfill, formulated during the Phase I ERA, are presented together with Phase II ERA results to provide a weight-of-evidence approach to the final evaluation of potential risks at the site. Finally, the Phase II ERA provides information on site-specific ecological cleanup goals for soil, surface water, and sediment SOPCs.

U.3.1.3 Statutory and Regulatory Background

The statutory and regulatory background of the site is provided in Section 1 of the RRII report.

U.3.1.4 Technical Guidance

The technical guidance for the performance of the Phase II ERA is identical to that used for the Phase I ERA and includes the same tasks, which are as follows:

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- Problem Formulation;
- Analysis; and
- Risk Characterization.

U.3.2 PROBLEM FORMULATION

A description of the problem formulation process is presented in Section U.2.2 of the Phase I ERA.

U.3.2.1 Site Description

The location, a detailed description, and the history of the site are provided in Section 1 of the RRII report.

U.3.2.2 Previous Studies of Site-Related Stressors

The Phase I ERA evaluated potential risks to site-associated wildlife, in general terms, using ESI surface soil data. The only SOPCs predicted to pose significant risks to undeveloped landfill measurement species (shrew, robin, and kestrel) and communities (vegetation and soil macroinvertebrates) were benzo(a)pyrene and several inorganics. The SOPCs that exceeded background or benchmark values by the greatest magnitude and frequency were aluminum, barium, cadmium, copper, iron, lead, mercury, vanadium, and zinc.

U.3.2.3 Identification of Potential Stressors of Ecological Concern

The introduction to the identification of potential stressors of ecological concern is presented in Section U.2.2.3 of the Phase I ERA.

Chemical Site-Related Stressors

This section identifies site-related chemical SOPCs evaluated in the Phase II ERA. The methodology described herein reflects national risk assessment guidance (USEPA 1992a). Chemical SOPCs for the Phase II ERA were selected by completing the following steps:

initial data quality review, review of the spacial distribution of sampling sites and frequency of detection (FOD) screening, and comparisons of chemical concentrations with natural background concentrations and with RBSCs derived for measurement species and communities during the Phase I ERA. The process for selecting potential SOPCs is outlined in Figure U-6.

Initial Data Quality Review

In this section, an initial data quality review was conducted to locate, assemble, and determine the usability of RRII surface soil, surface water, and sediment data for the Phase II ERA. The process for review of RRII analytical data is presented in Section U.2.2.3 of the Phase I ERA. Because of the number of surface soil samples collected on the undeveloped landfill (52), it was not feasible to include a list of potential SOPC concentrations for each sample evaluated. However, data qualifiers for the RRII data set and their definitions are provided in Table V-30.

Spatial Representation and Frequency of Detection of Site-Related Stressors

Site sample location maps were reviewed to examine the spatial representativeness of surface soil, surface water, and sediment samples collected during the RRII. Surface soil samples (0 to 3 inches) were collected on a 200-foot sample grid throughout the site, yielding a total of 52 undeveloped landfill surface soil samples (Figure U-7). At 18 undeveloped landfill grid locations, a second surface soil sample was collected adjacent to each 0-to 3-inch sample from 0 to 24 inches solely for the ERA. Use of this grid sampling technique ensured that the number and locations of surface soil samples collected on the undeveloped landfill were representative of the entire undeveloped area and not biased toward areas of suspected contamination. Based on this grid size, the probability of detecting a circular hot spot with a radius of 100 feet is 80 percent (EPA 1991b). The probability of detecting an eliptical hot spot with the same radius would be 88 percent. As the size of the hot spot decreases, the probability of detecting each of these types of hot spots decreases, respectively.

Characterization of potential surface water and sediment contamination in the Florida Avenue Canal and Peoples Avenue Canal was conducted during the RRII. Ten collocated

surface water and sediment samples were collected: six in the Florida Avenue Canal and four in the Peoples Avenue Canal. In the Florida Avenue Canal, two sample points were located west of the site (upgradient), one was adjacent to the site (downgradient), and three were east of the site (downgradient). In the Peoples Avenue Canal, two samples points were located north of the site (upgradient) and two were adjacent to the site (downgradient).

The number of surface water and sediment samples collected adjacent to the site from both canals was inadequate for characterizing the spatial extent of potential ecological risks. In addition, due to the extensive number of potential sources and drainage outfalls (e.g., stormwater and uncontrolled surface drainage pathways) for these canals, it was not possible to attribute potential contamination to the site (see Section 4 of the RRII). The samples do, however, provide an estimate of potential SOPCs and associated concentrations in surface water and sediment adjacent to the site when compared with upgradient locations.

Data sets for each medium were queried to determine the range of concentrations and FOD for each SOPC (Tables V-30 through V-34). The FOD was presented as the number of samples in which a chemical was positively detected (no "U", "JB", "*", "T", or"R" qualifiers) divided by the total number of samples analyzed for that chemical. If the FOD for a chemical was less than or equal to 5%, it was eliminated from further evaluation unless the maximum detected concentration was high enough to suggest a localized area of contamination (hot spot). Potential hot spots were investigated further by checking analytical data from samples around the hot spot. If these data indicated that the hot spot concentration was an outlier, the SOPC was removed from further evaluation. If a hot spot was supported through spacial distribution of analytes in nearby samples or if no other samples were taken in the area, the SOPC was retained. These and all SOPCs detected at an FOD of greater than 5% were included in the next screening step.

Table V-30 presents a summary of RRII surface soil data collected from the undeveloped landfill. Based on FOD screening, the following organic chemicals were eliminated from further review in the Phase II ERA: tetrachloroethene, bromomethane, carbon-disulfide, chloromethane, 4-chloro-3-methylphenol, 2-chlorophenol, 1,4-dichlorobenzene, and 4-methylphenol. Maximum concentrations of these organic chemicals were low (the highest concentration was 0.17 mg/kg for 1,4-dichlorobenzene) suggesting that there were

no localized hot spots associated with these chemicals. All inorganic analytes detected in the Phase II ERA data set exceeded a FOD of 5% and, therefore, were included in the next screening step.

For Florida Avenue Canal and Peoples Avenue Canal, FOD screening was not feasible because the total number of samples collected adjacent to the site within each canal was less than 20. Therefore, all organic chemicals and inorganic analytes detected in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment were included in the next screening step. Tables V-31 through V-34 present a summary of surface water and sediment data collected from Florida Avenue Canal and Peoples Avenue Canal.

Background Screening

Local background concentrations of inorganic SOPCs in surface soil, and upgradient concentrations of inorganic SOPCs in surface water and sediment were determined during the RRII. Ten background surface soil samples were collected from areas considered unimpacted by and representative of conditions on the undeveloped landfill. Due to the limited availability of background areas that could be considered representative of the undeveloped landfill, eight of the ten background surface soil samples were collected from schools. Care was taken to collect the school samples from areas which most resembled the undeveloped landfill (i.e., samples were collected from treed and grassy areas beyond the immediate vicinity of the school building). The other two background samples were collected from property along the Inner Harbor Navigation Canal. This was a wooded area and more closely resembled the undeveloped portion of the landfill.

For the Florida Avenue Canal, the two upgradient samples collected west of the site were used as background to screen the sample collected adjacent to the site because storm-water always flows from west to east at the two upgradient locations (Figure U-8). In Peoples Avenue Canal, the two upgradient samples collected north of the site were used as background to screen the two samples collected adjacent to the site because stormwater flow adjacent to and north of the site is always from north to south (Figure U-8).

Generally, the process of identifying potential SOPCs for an ERA involves a comparison of inorganic concentrations in site-related environmental media to local or

regional background media concentrations because inorganic chemicals are "naturally occurring" in most media. In the process of identifying SOPCs associated with the ASL site, site-related inorganic SOPCs were compared to local background or upgradient media concentrations. Maximum concentrations of each potential inorganic SOPC in each on-site surface soil sample were compared to the median background concentration of that SOPC (EPA 1994) to identify SOPCs in undeveloped landfill surface soil (Table V-30). Maximum concentrations of each inorganic SOPC detected in undeveloped landfill surface soil exceeded the respective median background concentrations. Therefore, all inorganic soil SOPCs were included in the next screening step. Antimony and cyanide were detected in undeveloped landfill surface soil samples but not in background samples. These two SOPCs also were included in the next screening step.

Maximum concentrations of each potential inorganic SOPC in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment were compared to mean upgradient concentrations of those SOPCs (EPA 1994) to identify SOPCs in surface water and sediment (Tables V-31 through V-34). In Florida Avenue Canal, arsenic and lead exceeded mean upgradient concentrations in surface water (Table V-31), and cadmium, copper, lead, and manganese exceeded mean upgradient concentrations in sediment (Table V-32). In Peoples Avenue Canal, iron was the only SOPC which exceeded mean upgradient concentrations in surface water (Table V-33) while lead and mercury exceeded upgradient concentrations in sediment (Table V-34).

Organic chemicals detected in undeveloped landfill surface soil and in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment were not compared to local background or upgradient concentrations, respectively (EPA 1994). Therefore, all organic chemicals detected in each of these media were included in the next screening step.

Risk-Based Screening

The risk-based screening section of the Phase II ERA is divided into two parts; terrestrial and aquatic. Risk-based benchmarks, criteria, or guidelines were used to screen SOPCs in undeveloped landfill surface soil and Florida Avenue Canal and Peoples Avenue Canal surface water and sediment. Maximum concentrations of inorganic SOPCs which

exceeded median local background concentrations in undeveloped landfill surface soil, and maximum concentrations of inorganic SOPCs which exceeded mean upgradient concentrations in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment as well as maximum concentrations of all organic SOPCs detected in each of these media were compared to media-specific risk-based concentrations (RBCs).

Terrestrial Risk-Based Screening

RBSCs for measurement species and communities determined during the Phase I ERA were used to screen potential SOPCs detected in undeveloped landfill surface soil from the RRII data set. Table V-35 presents comparisons of RRII maximum surface soil SOPC concentrations to RBSCs for vegetation, soil biota, and the measurement species (shrew, robin, and kestrel) evaluated during the Phase I ERA. In many cases, RBSCs were not available for comparison because ecotoxicological data were not available for a particular SOPC and/or measurement species evaluated during the Phase I ERA, or the SOPC was not detected in the ESI data set and, therefore, was not evaluated during the Phase I ERA. The only way an SOPC could be eliminated from further evaluation in the Phase II ERA was if RBSCs were available for all measurement species and communities and the maximum concentration of the RRII SOPC was below each of these RBSCs. If one RBSC was not available for a particular SOPC, then that SOPC was included for evaluation in the Phase II ERA.

Based on this screening approach, 4,4'-DDE and gamma-chlordane were eliminated from further review. Of the remaining 51 organic SOPCs, only benzo(a)pyrene, alpha-chlordane, 4,4'-DDD, 4,4'-DDT, and 2,3,7,8-TCDD exceeded RBSCs for one or more of the measurement species or communities. Twenty-eight organic SOPCs had at least one RBSC for comparison but did not exceed RBSCs. These 28 SOPCs were included for evaluation in the Phase II ERA because they could not be evaluated for all measurement species and communities. Eighteen organic SOPCs either were not evaluated during the Phase I ERA and/or lacked RBSCs and were therefore included in the Phase II ERA.

In contrast, maximum concentrations of 19 out of 20 inorganic SOPCs detected in the RRII data set exceeded RBSCs for one or more measurement species or communities

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evaluated during the Phase I ERA. Cyanide did not exceed the RBSC for soil macroinvertebrates. However, this SOPC lacked RBSCs for the one remaining measurement community and the three measurement species and, therefore, was included in the Phase II ERA. In addition to cyanide, selenium was detected only in the Phase II ERA and was included for evaluation in the Phase II ERA.

Aquatic Risk-Based Screening

Louisiana State Ambient Water Quality Criteria (LA AWQC) (LDEQ 1992) and Ontario Sediment Quality Guidelines (Persuad *et al.* 1993) were used to screen inorganic SOPCs which exceeded upgradient concentrations and all organic SOPCs detected in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment, respectively. Table V-36 presents a comparison of Florida Avenue Canal and Peoples Avenue Canal maximum surface water SOPC concentrations to LA AWQC. The AWQC are designed for the protection of aquatic life and are based on acute and chronic concentrations in fish and marine waters as specified in the EPA criteria documents and were developed to ensure fish and wildlife propagation (LDEQ 1992). In the absence of AWQC, a scientific literature search was completed for concentrations in surface water which corresponded to levels that elicit adverse effects in selected aquatic biota. In the Florida Avenue Canal surface water sample collected adjacent to the site, maximum concentrations of chloroform, arsenic, and lead were compared to LA AWQC (Table V-36). Chloroform and arsenic did not exceed either chronic or acute criteria and thus were eliminated from further review. The maximum concentration of lead exceeded chronic AWQC and, therefore, was included for evaluation in the Phase II ERA.

In Peoples Avenue Canal surface water samples collected adjacent to the site, maximum concentrations of chloroform and iron were compared to LA AWQC (Table V-36). Chloroform did not exceed either chronic or acute criteria and thus was eliminated from further review. LA AWQC were unavailable for iron; the maximum concentration of iron exceeded the lowest surface water concentration at which adverse effects were observed in aquatic biota (OHM/TADS 1994); therefore, iron was included for evaluation in the Phase II ERA.

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In evaluating potential risks to sediment biota from exposure to SOPCs in Florida Avenue Canal and Peoples Avenue Canal sediment, maximum concentrations of inorganic SOPCs which exceeded mean upgradient concentrations, and all organic SOPCs detected in sediment from these canals, were compared to published sediment quality guidelines (Persuad *et al.* 1993). Although these guidelines do not constitute regulatory criteria in the United States, they serve as indicators of potential ecological risk to sediment-dwelling organisms. Currently, state and EPA criteria are unavailable for organic or inorganic analytes in freshwater sediments.

Ontario Sediment Quality Guidelines were developed using freshwater sediment toxicity data for the protection of aquatic organisms that are directly impacted by contaminated sediment, namely the sediment-dwelling (benthic) species. These guidelines establish three levels of effect: No Effect Level, Lowest Effect Level, and Severe Effect Level. The Lowest and Severe Effects Levels are based on the long-term effects that the SOPCs may have on sediment-dwelling organisms. The No Effect Level is based on the concentrations of chemicals at which no bioaccumulation occurs (Persaud *et al.* 1993).

The No Effect Level, in most cases, however, will not provide the Risk Manager with adequate information to assess the need for remedial action. There is often a large gap between the No Effect Level and Lowest Effect Level; therefore, an exceedance of the No Effect Level by a contaminant does not necessarily indicate the potential for an adverse effect. The Lowest Effect Level "indicates a level of contamination which has no effect on the majority of the sediment-dwelling organisms. The sediment is clean to marginally polluted" (Persaud *et. al.* 1993). The Severe Effect Level "is considered heavily polluted and likely to affect the health of sediment dwelling organisms". At this point, "testing is required to determine whether or not the sediment is acutely toxic." Based on these definitions, the Lowest and Severe Effect Levels represent the benchmark values by which sediment contamination is to be evaluated.

Tables V-37 and V-38 present comparisons of Florida Avenue Canal and Peoples Avenue Canal maximum sediment SOPC concentrations to Ontario Sediment Quality Guidelines, respectively. In the Florida Avenue Canal sediment sample collected adjacent to the site, pyrene, aldrin, alpha-chlordane, endrin, gamma-chlordane, cadmium, copper, and

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lead exceeded the Lowest Effects Levels by less than an order of magnitude. Benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, 4,4'-DDE, dieldrin, and manganese were eliminated from further review in the Phase II ERA based on comparison to Ontario Sediment Quality Guidelines. In Peoples Avenue Canal sediment samples collected adjacent to the site, 10 PAHs, 9 pesticides, and mercury exceeded Lowest Effect Levels by less than an order of magnitude. The maximum concentration of lead detected in Peoples Avenue Canal exceeded the Severe Effects Level. Ontario sediment guidelines were unavailable for 2,3,7,8-TCDD, and a comparison was made to Wisconsin Maximum Allowable Sediment Concentrations (WDNR 1987). The compound 2,3,7,8-TCDD exceeded the maximum allowable sediment concentration by three orders of magnitude and, therefore, was included in the Phase II ERA. Fluorene was the only chemical eliminated based on comparison to Ontario Sediment Quality Guidelines in Peoples Avenue Canal.

Ontario Sediment Quality Guidelines were unavailable for all volatile and many semivolatile organic SOPCs detected within each canal. Therefore, these sediment SOPCs were included for evaluation in the Phase II ERA.

U.3.2.4 Summary of Site-Related Stressors of Potential Concern

This section presents screening results for SOPCs detected in surface soil from the undeveloped landfill and surface water and sediment from Florida Avenue Canal and Peoples Avenue Canal.

U.3.2.4.1 Undeveloped Landfill Surface Soil.

Table V-39 presents the 71 surface soil SOPCs included in the Phase II ERA after screening. Of the 51 organic SOPCs included for evaluation in the Phase II ERA, benzo(a)-pyrene, alpha-chlordane, 4,4'-DDD, 4,4'-DDT, and 2,3,7,8-TCDD were the only Phase II organic SOPCs that exceeded RBSCs. The remaining 46 SOPCs either contained an incomplete set of RBSCs or lacked RBSCs entirely. Therefore, these SOPCs, along with the five which exceeded RBSCs, were included for evaluation in the Phase II ERA.

A total of 20 inorganic SOPCs were included in the ERA after screening. Of these, 18 exceeded one or more RBSCs. Cyanide and selenium were detected in the RRII data set but were not evaluated during the Phase I ERA. Therefore, these two SOPCs, along with the 18 other inorganic SOPCs which exceeded RBSCs were included for evaluation in the Phase II ERA.

U.3.2.4.2 Florida and Peoples Avenue Canal Surface Water and Sediment

Lead and iron were the only SOPCs which exceeded both mean upgradient concentrations and LA AWQC in Florida Avenue Canal and Peoples Avenue Canal, respectively.

Table V-40 presents the 20 Florida Avenue Canal sediment SOPCs included in the Phase II ERA after comparison to mean upgradient concentrations and Ontario Sediment Quality Guidelines. Of the 17 organic SOPCs included for evaluation, pyrene, aldrin, alpha-chlordane, endrin, and gamma-chlordane exceeded Ontario sediment guidelines; guidelines were unavailable for 12 of the 17 organic SOPCs. Inorganic SOPCs included in the Phase II ERA after screening procedures include cadmium, copper, and lead.

Table V-40 presents the 47 Peoples Avenue Canal sediment SOPCs included in the Phase II ERA after comparison to upgradient concentrations and Ontario Sediment Quality Guidelines. Of the 45 organic SOPCs detected in Peoples Avenue Canal sediment, 10 semivolatile organics, 9 pesticides, and 2,3,7,8-TCDD all exceeded available sediment guidelines; 2,3,7,8-TCDD exceeded Wisconsin Maximum Allowable Sediment Concentrations by three orders of magnitude. Inorganic SOPCs included in the Phase II ERA after screening procedures include lead and mercury.

U.3.2.5 Ecosystem Components

The introduction to the ecosystem components section is presented in Section U.2.2.4 of the Phase I ERA.

U.3.2.5.1 Regional and Local Ecology

General background information on the topography, geology, hydrogeology, and meteorological conditions of the site and surrounding areas is presented in Section 1.6 of the RRII report.

U.3.2.5.2 Ecology of the Undeveloped Landfill

A description of the ecological setting of the undeveloped landfill is provided in Section U.2.2.4 of the Phase I ERA.

U.3.2.5.3 Ecology of Florida and Peoples Avenue Canals

Florida Avenue Canal and Peoples Avenue Canal, which run parallel to the southern and western borders of the site, respectively, were qualitatively surveyed during the site reconnaissance (also see Section 2.8.3 of the RRII and corresponding Figure 2-14). The objective of the survey was to characterize aquatic ecosystems within each canal by evaluating general habitat quality, species diversity and abundance, and the value of these ecosystems. Based on information gathered during this survey, potential impacts to aquatic wildlife from site-related SOPCs potentially entering the canals via surface water runoff or groundwater infiltration were evaluated. Figure U-8 (Appendix U) presents a diagram illustrating Florida Avenue Canal and Peoples Avenue Canal and their relative proximity to the site.

Canals' Structure and Hydrology

The Florida Avenue Canal runs in an east-west direction. It is essentially a concrete trough, 25 feet wide at its base with 8-foot high vertical walls. The canal receives stormwater from street surfaces within the area through other canals and sewer pipes. The City of New Orleans does not issue permits to discharge directly to canal systems (Orleans Parish Sewer and Water Board 1994). Therefore, chemicals found in these canals are most likely associated with traffic and residential dwellings; the chemicals enter the sewer systems via overland flow of stormwater.

Peoples Avenue Canal runs in a north-south direction. The walls and bottom of the canal are 18 feet wide each and composed of concrete. The walls are sloped at a 45 degree

angle to the bottom of the canal. There is an invert in the canal north of the site located at the Gentilly Road crossing which divides the canal. North of this invert, the canal flows north to Prentiss Avenue Canal, and south of the invert, the canal flows south toward Pumping Station D. Like Florida Avenue Canal, Peoples Avenue Canal receives stormwater from other canals and sewers. Approximately 400 feet east of Peoples Avenue bridge, at the southwestern corner of the site, a tributary canal connects the two canals and Pumping Station D.

Stormwater originating from the vicinity of the site and entering these two canals will flow either to Pumping Station D or Pumping Station 19, depending on the amount of stormwater. The following subsections present a discussion of water flow within these canals during dry and wet weather. Figure U-8 presents the dry and wet weather flows in Florida Avenue Canal and Peoples Avenue Canal.

Dry Weather Flow

During periods of dry weather, eastward and westward flows within Florida Avenue Canal converge at the tributary canal and then flow north and west to Pumping Station D. The southward flow of Peoples Avenue Canal enters the westward flowing section of the tributary canal and converges with the stormwater from Florida Avenue Canal. Stormwater entering Pumping Station D is pumped to the Mississippi River. The City of New Orleans chooses to pump dry weather stormwater to the Mississippi River rather than Lake Pontchartrain because dry weather flow can potentially become contaminated with pesticides and other household-related chemicals (Orleans Parish Sewer and Water Board 1994).

Wet Weather Flow

The maximum pumping capacity of Pumping Station D is 625 cubic feet per second (cfs) (Orleans Parish Sewer and Water Board 1994). During periods of wet weather, the combined volume of stormwater within Florida Avenue Canal and Peoples Avenue Canal exceeds the maximum pumping capacity of Pumping Station D. When this occurs, pumps at Pumping Station D are shut off, and water from Peoples Avenue Canal entering the tributary canal flows east toward Florida Avenue Canal. All stormwater within Florida Avenue Canal

flows eastward toward Pumping Station 19. Pumping Station 19, located adjacent to the Inner Harbor Navigation Canal, has a pumping capacity of 3,770 cfs (Orleans Parish Sewer and Water Board 1994). This pump rate is adequate to handle the combined stormwater from both canals. Water received at Pumping Station 19 is pumped into the Inner Harbor Navigation Canal where it eventually reaches Lake Pontchartrain.

U.3.2.5.4 Florida Avenue Canal Ecology

Florida Avenue Canal was surveyed during dry weather between the Louisa Street Bridge and Peoples Avenue Bridge to qualitatively characterize the aquatic habitat and select biological survey locations. Several stormwater outfalls were observed on either side of the canal. The integrity of the canal walls along this section was suspect in many locations as numerous cracks were observed. In addition, scattered, miscellaneous household debris was observed in the canal throughout the area surveyed.

The water within the canal was approximately 3-feet deep and contained an abundance of suspended solids. There was no observable oil sheen on the water surface; however, there was a slight septic odor. Sediment along the bottom of the canal was black, silty in texture, had no distinctive odor, and ranged from approximately 0.25 to 0.5 inches in depth. Because of the concrete bottom and the rate of water flow during wet weather, sediment generally does not accumulate on the canal bottom. If sedimentation occurs, both Florida Avenue Canal and Peoples Avenue Canal are dredged (Orleans Parish Sewer and Water Board 1994).

Based on the results of this initial survey and due to accessibility constraints (as discussed in Volume I, Section 2 of the RRII report), a survey of aquatic biota within Florida Avenue Canal was attempted at two locations using a 25-foot-wide, 5-foot-deep purse seine (as described in Section 2). The first seining location selected was immediately west of the Louisa Street Bridge, and the second location was below the Almonaster Street Bridge, immediately east of the Peoples Avenue Bridge. No aquatic biota were caught at either location.

Because these two seining attempts were unsuccessful, additional locations along this segment of the canal were surveyed using a long-handled dipnet. The dipnet survey yielded

the following aquatic biota: bloodworms (*Tubfix sp.*), snails (*Littorina sp.*), and leeches. Mosquitofish (*Gambusia affinis*) were tentatively identified in the canal; however, none were caught. Numerous crayfish (*Fallicambarus devistator*) chimneys lined the outside of the canal walls, but no captures or sightings were made during the survey.

No evidence of aquatic macrophytes was found in the surveyed section of the canal. In general, no habitat suitable for propagation and maintenance of aquatic or semi-aquatic species was found at any location within this section of the Florida Avenue Canal.

U.3.2.5.5 Peoples Avenue Canal Ecology

Peoples Avenue Canal was surveyed between the Peoples Avenue Bridge and the approximate northern border of the site to qualitatively characterize the aquatic habitat and select biological survey locations. The segment of Peoples Avenue Canal that runs parallel to the western border of the site was divided into two sections: the northern one-third, and the southern two-thirds. This division was based upon observations of aquatic biota captured and general habitat quality.

The northern third of Peoples Avenue Canal is bounded by vertical embankments approximately 3 feet in height. The embankments contain limited vegetative cover and exhibited evidence of slight erosion along portions adjacent to the water. Embankment tops are heavily vegetated and did not appear well maintained. The southern two-thirds of the canal appeared to have been better maintained; canal walls in this section contained no sediment or vegetative cover.

Several characteristics were common to both sections of Peoples Avenue Canal, including: scattered debris within the canal, drainage outfalls on either side, off-gassing of sediment within the canal as indicated by vigorous bubbling, and crayfish chimneys lining the outside of either side of the canal. The water contained an abundance of suspended solids. Oil sheens were observed around the scattered debris and also when sediment was disturbed. Sediment along the bottom of the canal was black, silty in texture, had a petroleum odor, and ranged from approximately 0.5 to 1.0 inch in depth.

Based on the results of this initial survey of both sections of Peoples Avenue Canal, it was determined that surveying the canal using a purse seine would not be attempted due to

accessibility constraints and health and safety concerns (see Section 2 of the RRII report). Therefore, the aquatic survey of both sections of Peoples Avenue Canal was performed using a long-handled dipnet at selected locations.

The dipnet survey of the southern two-thirds of the canal yielded the following aquatic biota: bloodworms, snails, and blue-green algae. No evidence of aquatic macrophytes was found in either section of the canal. Other observations in this section included small mammal tracks and scat along the east wall of the canal.

In the northern one-third of Peoples Avenue Canal, one bullfrog was caught (*Rana catesbeiana*) and several others were observed jumping from the embankment into the canal. However, no evidence of egg bundles or tadpoles was found. Also, Mosquitofish were tentatively identified in this section; however, none were caught. Several species of birds were observed along the western bank of the canal in the northernmost portion of this section and north beyond the approximate site boundary. Species observed include four snowy egrets (*Egretta thula*) and one killdeer (*Charadrius vociferus*). The following day, two snowy egrets were observed at this location.

Biota collected within Florida Avenue Canal and Peoples Avenue Canal are indicative of poor water quality and high biological oxygen demand. Only Peoples Avenue Canal contained any substantial evidence of the propagation of any aquatic or semi-aquatic wildlife species. Although there were several ecological receptors observed utilizing this canal, the volatile nature of this canal (periodic dredging, heavy rainfall, numerous potential sources and drainage outfalls, and application of herbicides to the banks of this canal [E & E 1995]) makes it impossible to attribute contaminants to the site.

U.3.2.6 Threatened, Endangered, Sensitive, or Rare Species

An evaluation of the presence of threatened, endangered, sensitive, or rare species that may potentially be found within the vicinity of the site is provided in Section U.2.2.4 of the Phase I ERA.

Wetlands Survey

An evaluation of the presence of wetland habitats potentially found on the undeveloped landfill is provided in Section U.2.2.4 of the Phase I ERA.

U.3.2.7 Potential Pathways of Stressor Migration and Exposure

Potential migration pathways for SOPCs in undeveloped landfill surface soil are provided in Section U.2.2.5 of the Phase I ERA. Because the Florida Avenue Canal and Peoples Avenue Canal only were evaluated during the RRII, this section presents potential pathways of migration and fate for SOPCs detected in surface water and sediment, as well as soil SOPCs detected in the RRII data set and not detected during the ESI. Those pathways that represent the greatest potential for exposure were selected for examination in the Phase II ERA.

Numerous organic and inorganic contaminants are present within the Florida Avenue Canal and Peoples Avenue Canal due to the nature of their intended use. These canals are designed to collect and transport stormwater runoff from the surrounding area to points within the Mississippi River and Lake Pontchartrain. Due to the highly urbanized setting in which these canals operate, a wide variety of chemical contaminants are likely to be present within these canals at any one time. In addition, these canals may also receive chemical contaminants via groundwater infiltration. The undeveloped landfill may contribute contaminants to these canals, however, due to the potentially extensive number of sources and entry points within these two canals, attribution of chemical contamination to the undeveloped landfill is not feasible. The following is a discussion of the major pathways of contaminant migration and exposure for the Florida Avenue Canal and the Peoples Avenue Canal. Figure U-9 shows the potential pathways of contaminant migration and receptor exposure routes. Several ecologically relevant migration pathways for SOPCs potentially exist within these canals, namely:

- Migration of SOPCs via groundwater to discharge points within Florida Avenue Canal and Peoples Avenue Canal; and
- Deposition from canals surface water to sediment.

The following subsection discusses the major pathways of contaminant migration and exposure for the Florida Avenue Canal and Peoples Avenue Canal.

U.3.2.7.1 Florida Avenue Canal and Peoples Avenue Canal

The potential transport pathways for SOPCs which enter Florida Avenue Canal and Peoples Avenue Canal surface water are volatilization, biodegradation, photo-oxidation, sorption to sediments, and biota translocation. Because of the relatively neutral pHs of surface water within Florida Avenue Canal (7.7) and Peoples Avenue Canal (7.0), the major fate process of contaminants entering these canals will be sorption to sediments. For several SOPCs, volatilization is likely to be high, especially for the volatile organic SOPCs with high vapor pressures.

Because very few SOPCs are likely to be dissolved in surface water within these canals, biota translocation will likely occur only through the ingestion of contaminated sediments and benthic invertebrates associated with those sediments.

U.3.2.7.2 Transport and Fate of Site-Related Stressors in Environmental Media

This section presents a qualitative evaluation of the fate of selected SOPCs in Florida Avenue Canal and Peoples Avenue Canal surface water and sediment and the potential for bioaccumulation and/or biomagnification through the aquatic food chain. In addition to the canals, the fate of several SOPCs detected in site soil samples collected during the RRII and not evaluated during the Phase I ERA are presented in this section. As in the Phase I ERA, SOPCs evaluated in this section are assumed to be representative of other SOPCs from each analyte class detected in the RRII data set which possess similar physicochemical properties. Table V-41 presents a summary of transport and fate characteristics for SOPCs discussed in this section.

Fate of Bis(2-ethylhexyl)phthalate in Environmental Media

This section presents the fate of bis(2-ethylhexyl)phthalate in undeveloped landfill surface soil and Peoples Avenue Canal sediment and the potential for bioaccumulation and/or biomagnification in the terrestrial and aquatic food chains. The fate of a majority of

environmentally released bis(2-ethylhexyl)phthalate is the atmosphere, soils, and sediment. It is expected to remain in the atmosphere for relatively long periods of time because photolysis does not occur (Callahan *et al.* 1979). Rainfall is a likely transport mechanism for bis(2-ethylhexyl)phthalate from the atmosphere to soil and surface water (HSDB 1994).

Transformation of bis(2-ethylhexyl)phthalate in the environment occurs mainly through biodegradation. Biodegradation in soil and water is likely to result in decreased concentrations of bis(2-ethylhexyl)phthalate and is expected to be more rapid in aerobic situations. Bis(2-ethylhexyl)phthalate is not expected to volatilize in soil due to its low vapor pressure (1.32 mm Hg at 200 °C). Hydrolysis is not expected to be a significant breakdown process in terrestrial or aquatic environments.

Callahan *et al.* (1979) reported that there are no available descriptions of the abiotic degradation of bis(2-ethylhexyl)phthalate. ATSDR (1989a), however, reported that degradation via reactions with hydroxyl radicals can occur.

Bis(2-ethylhexyl)phthalate is expected to adsorb significantly in soil and is not likely to migrate vertically to groundwater (ATSDR 1989a; HSDB 1994). Given the dense vegetative cover at the site and its low vapor pressure, it is expected that bis(2-ethylhexyl)-phthalate will be retained in the upper surface soil horizons of the undeveloped landfill and will not migrate laterally or vertically. In Peoples Avenue Canal, bis(2-ethylhexyl)phthalate is expected to adsorb strongly to the sediment based upon its octanol/water partitioning coefficient (log K_{OW} = 4.89 - 8.73), organic carbon partitioning coefficient (K_{OC} = 10,000 - 100,000) (Callahan *et al.* 1979; HSDB 1994), and low solubility (0.4 - 1.3 mg/L).

Bis(2-ethylhexyl)phthalate is expected to bioaccumulate in the lower levels of the terrestrial and aquatic food chains, but biomagnification is not expected. Therefore, potential exposure of terrestrial wildlife to bis(2-ethylhexyl)phthalate on the undeveloped landfill and in Peoples Avenue Canal is likely to occur mainly through the ingestion of surface soil and sediment, respectively. Uptake of bis(2-ethylhexyl)phthalate by terrestrial vegetation is possible and will be assessed in the exposure model.

Fate of 1,2-Dichloroethene in Environmental Media

This section presents the fate of 1,2-dichloroethene in undeveloped landfill surface soil and its potential for bioaccumulation and/or biomagnification in the terrestrial food chain. Cis-1,2-dichloroethene is the dichloroethene isomer most likely to be present in undeveloped landfill surface soil (Howard *et al.* 1990). The fate of the majority of environmentally released 1,2-dichloroethene is the atmosphere. Once in the atmosphere, it is expected to be broken down by reaction with hydroxyl radicals within a day (Callahan *et al.* 1979; HSDB 1994).

Biodegradation and photo-oxidation are the major transformation processes for 1,2-dichloroethene in soils. Anaerobic biodegradation in soil may result in decreased concentrations of 1,2-dichloroethene; the cis- isomer is expected to biodegrade more rapidly than the trans- isomer. Photolysis, however, is not expected to be a breakdown process for 1,2-dichloroethene in terrestrial media (Callahan *et al.* 1979).

The compound 1,2-dichloroethene is not expected to adsorb to soils (K_{OC} = 36 - 49) and may migrate to groundwater (Howard *et al.* 1990). Also, 1,2-dichloroethene volatilizes rapidly from soils due to its relatively high vapor pressure (200 - 340 mm Hg at 35°C). Therefore, levels of 1,2-dichloroethene are not expected to be significant in the upper surface soil horizons at the site. The maximum concentration of 1,2-dichloroethene detected in RRII undeveloped landfill surface soil samples was 0.007 mg/kg.

The compound 1,2-dichloroethene is not expected to bioaccumulate or biomagnify in the terrestrial food chain. Therefore, potential exposure of terrestrial wildlife to 1,2-dichloroethene on the undeveloped landfill is likely to occur only through the ingestion of surface soil.

Fate of Methylene Chloride in Environmental Media

This section presents the fate of methylene chloride in undeveloped landfill surface soil and Florida Avenue Canal sediment and its potential for bioaccumulation and/or biomagnification in the terrestrial and aquatic food chains. The fate of the majority of environmentally released methylene chloride (dichloromethane) is the atmosphere. In the

atmosphere, it is expected to have a half-life of several months (ATSDR 1989b, Callahan *et al.* 1979, HSDB 1994).

Biodegradation and photo-oxidation are the major transformation processes for methylene chloride in soil and in an aquatic environment (ATSDR 1989b). Biodegradation in soil and water may result in decreased concentrations of methylene chloride, and may be more rapid in aerobic situations. Photolysis and hydrolysis are not expected breakdown processes for methylene chloride in terrestrial and aquatic media (Callahan *et al.* 1979).

Methylene chloride is not expected to significantly adsorb to soils on the undeveloped landfill due to its relatively high vapor pressure (435 mm Hg at 25 °C) and high solubility (Howard *et al.* 1990). Because of its high vapor pressure, volatilization of methylene chloride from soil is rapid, and concentrations are expected to be low. The maximum concentration of methylene chloride detected in RRII undeveloped landfill surface soil samples was 0.07 mg/kg. In addition, due to its high solubility, methylene chloride may migrate to groundwater (ATSDR 1989b). Similarly, adsorption to sediment in Florida Avenue Canal is expected to be low because of its calculated organic carbon partitioning coefficient (K_{OC}) of 48 and a very short half-life (Howard *et al.* 1990).

Bioaccumulation and biomagnification of methylene chloride in the terrestrial and aquatic food chains are not expected due to its low octanol/water partitioning coefficient (log K_{OW} = 1.25) (Callahan *et al.* 1979). Therefore, potential exposure of wildlife to methylene chloride on the undeveloped landfill and in Florida Avenue Canal is likely to occur through the ingestion of contaminated soil and sediment, respectively.

Fate of PAHs in Environmental Media

This section presents the fate of PAHs in Florida Avenue Canal and Peoples Avenue Canal sediment and their potential for bioaccumulation and/or biomagnification in the aquatic food chain. PAHs comprised a majority of the organic surface soil SOPCs for the Phase II ERA; fate and transport characteristics of PAHs in undeveloped landfill surface soils are presented in Section U.2.2.5.2 of the Phase I ERA.

Because of their low solubility, PAHs in aquatic systems are primarily found sorbed to particles that have either settled to the bottom or are suspended in the water column

(ATSDR 1990a). Sorption of PAHs to sediments increases with increasing organic carbon content and is also directly dependent on particle size. The initial evaluation of data collected from the two canals supported the conclusion that the majority of PAHs in these systems have sorbed to the bottom sediments since there were no PAHs detected in surface water samples from either canal.

The ultimate fate of PAHs that accumulate in sediments is believed to be microbial metabolism (ATSDR 1990a). Photolysis, hydrolysis, and oxidation generally are not considered to be important processes for the degradation of PAHs in sediments. PAHs degrade very slowly in the absence of penetrating radiation and oxygen and may persist indefinitely in oxygen-poor basins or anoxic sediments (Eisler 1987a). Volatilization of lower molecular weight compounds may occur. However, it does not appear to be significant for higher molecular weight compounds (ATSDR 1990a). The rate and extent of biodegradation in sediment are affected by environmental factors, characteristics of the microbial population, and the physio-chemical properties of the PAHs. Environmental factors that may influence the rate of PAH degradation in sediment include temperature, pH, oxygen concentration, PAH concentrations, nutrients, and contaminant history of the sediment. Sorption of PAHs to sediment organic matter may limit biodegradation of compounds that would otherwise rapidly undergo metabolism (ATSDR 1990a).

Sediment-associated PAHs can be accumulated by bottom-dwelling invertebrates and fish (ATSDR 1990a). However, biomagnification has not been reported because of the tendency of many aquatic organisms to eliminate these compounds rapidly. Studies have shown that in aquatic systems, where assimilation of ingested PAHs was demonstrated, metabolism and excretion were also rapid (Eisler 1987a). In general, PAHs obtained from the diet can contribute to total tissue concentrations to a limited extent. In several food chain studies conducted using a variety of aquatic biota, decreasing PAH concentrations were found with increasing trophic level (ATSDR 1990a). Therefore, exposure of aquatic wildlife within Florida Avenue Canal and Peoples Avenue Canal to PAHs is likely to be limited to benthic invertebrates and species which ingest sediment incidentally while foraging.

Fate of 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE in Environmental Media

This section presents the fate of 4,4'-DDT and its metabolites (DDTR) in Peoples Avenue Canal sediment and the potential for bioaccumulation and/or biomagnification in the aquatic food chain. DDD and DDT were selected as SOPCs in surface soil for the Phase II ERA; fate and transport characteristics of DDTR in soils is presented in Section U.2.2.5.2 of the Phase I ERA.

The ultimate transformation of DDTR in the aquatic environment is likely to occur through biotransformation, especially biodegradation by benthic microorganisms in sediments (HSDB 1994). Other potential transformation mechanisms may include photo-oxidation and photolysis.

The dominant fate processes in aquatic environments are volatilization and sorption to biota and sediments. Sorption to biota and sediment is determined by the amount of suspended particulates in the water column (HSDB 1994). When levels of DDTR in surface water exceed water solubility limits, excess DDTR adsorbs to sediment. Sediment acts as the primary reservoir for excess quantities of DDTR in aquatic environments. Based on reported K_{oc}s for DDD and DDT (Section U.2.2.5.2 of the Phase I ERA), extensive adsorption to Peoples Avenue Canal sediments is expected.

DDTR is bioaccumulated and biomagnified in the aquatic food chain (ATSDR 1993a). However, most of the literature data pertains to uptake of DDTR by aquatic biota from surface water. Because DDTR was detected only in Peoples Avenue Canal sediment samples, movement of DDTR through in the aquatic food chain is likely to be limited to biota associated with the sediment. Therefore, exposure to aquatic wildlife within Peoples Avenue Canal is likely to occur through the ingestion of sediment and/or benthic species which are closely associated with the sediment.

Fate of Heptachlor in Environmental Media

This section presents the fate of heptachlor in undeveloped landfill surface soil and Peoples Avenue Canal sediment and its potential for bioaccumulation and/or biomagnification in the terrestrial and aquatic food chains. The fate of environmentally released heptachlor is the atmosphere, soils, and sediment (ATSDR 1993k). In the atmosphere, phytolysis is the

major transformation process for heptachlor (ATSDR 1993k). Rainfall is likely the most significant transport mechanism from the atmosphere to soil and surface water.

Biodegradation in soil and the aquatic environment is likely to result in decreased concentrations of heptachlor and is expected to be more rapid in aerobic situations. Hydrolysis is not expected to be a significant breakdown process in terrestrial or aquatic environments.

In soil, heptachlor may volatilize, but this process is variable depending upon soil and atmospheric conditions. Soil depth and humidity appear to be the most significant factors with shallower depth and lower humidity contributing to higher volatilization. Heptachlor is less likely to volatilize if it reaches soil depths of 3 cm below the surface or more (ATSDR 1993k). At these depths, it is expected to adsorb significantly to soils, especially soil high in organic carbon content such as that found on the undeveloped landfill (8.6%). Therefore, heptachlor is expected to be retained in the upper surface soil horizons on the undeveloped landfill and is not likely to migrate to groundwater (ATSDR 1993k). Similarly, adsorption to sediment in Peoples Avenue Canal is expected to be high because of its high calculated organic carbon partitioning coefficient (log K_{OC} = 4.34) (Chapman 1989).

Bioaccumulation and biomagnification of heptachlor in the terrestrial and aquatic food chains are likely due to its octanol/water partitioning coefficient (log K_{OW} = 5.4) (MacKay 1982). Therefore, potential exposure of wildlife to heptachlor on the undeveloped landfill is likely to occur through uptake by plants from soils and ingestion of contaminated soil, vegetation, or animal prey by soil invertebrates, herbivores, omnivores, and carnivores, respectively. Likewise, potential exposure of aquatic wildlife to heptachlor is likely to occur through ingestion of contaminated sediment or animal prey by herbivores, ominovores, and carnivores, respectively.

Fate of PCBs in Environmental Media

This section presents the fate of polychlorinated biphenyls (PCBs) in undeveloped landfill surface soil and their potential for bioaccumulation and/or biomagnification in the terrestrial food chain. Mobility of PCBs in soils depends on soil properties and chemical properties of the leaching substance. Soil properties that exert considerable influence on the

mobility of chemicals are types of colloids present, particle size distribution, pore volume and size distribution, water content, type of ground cover, slope, and organic carbon content (ATSDR 1993l). As a general rule, the higher the organic content of the soil, the lower the mobility of PCBs. The chemical properties of PCBs important to their transport in soil include water solubility, ionizability, volatility, and certain structural aspects such as the stearic effects of the chemicals themselves.

Aroclor 1254 and 1260, the PCBs of concern in the Phase II ERA, are non-ionic and have low water solubilities, low vapor pressures, and high affinities for the organic fraction of soils based on their high soil sorption coefficients (K_{oc}) (HSDB 1994).

The high soil-binding affinities of Aroclor 1254 and 1260 indicate that very little will partition to the water phase or be bioavailable. Their lower water solubilities, high octanol-water partition coefficients and demonstrated strong adsorption to soils indicate that significant leaching should not occur in soil under most conditions.

Based on the average pH (8.2) and organic content of undeveloped landfill surface soil and the sorptive nature of Aroclor 1254 and 1260, it is expected that these PCBs will be retained in the upper surface soil horizons and will not migrate vertically to groundwater. Due to the topography and extensive vegetative cover on the undeveloped landfill, transport of PCBs off-site via surface water runoff is unlikely except under flood conditions.

If PCBs are not tightly bound to soil particles (bioavailable), they have the potential to bioaccumulate and biomagnify in the terrestrial food chain. In general, PCBs have been detected in wildlife from areas of PCB contamination as well as in areas of the U.S. devoid of point-source PCB contamination (HSDB 1994). Plants absorb PCBs either directly from contaminated soils or from dust/vapors in the atmosphere. PCBs taken up directly from the soil are usually restricted to plant roots. Therefore, PCB content in leaves may be an indication of volatilization from soil and/or atmospheric deposition. Based on the known high organic content of surface soil on the undeveloped landfill and chemical properties of PCBs, it is unlikely that PCBs will be taken up by plants. Therefore, the most likely potential uptake of PCBs by terrestrial biota will be through direct ingestion of surface soil and subsequent biota translocation.

Fate of 2,3,7,8-TCDD in Environmental Media

This section presents the fate of 2,3,7,8-TCDD in undeveloped landfill surface soil and in Peoples Avenue Canal sediment and its potential for bioaccumulation and/or biomagnification in the terrestrial and aquatic food chains. Dioxins have not been deliberately produced or released in the environment; rather, they are unwanted trace contaminants formed during the production or combustion of chlorinated organic compounds. Physicochemical properties are important determinants in the environmental transport and fate processes directly affecting the exposure potential for environmental receptors. Given the absence of physicochemical property data for most dioxin (and related dibenzofuran) isomers, this section assumes the properties of the most toxic dioxin isomer, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), to evaluate dioxin transport and fate.

The compound 2,3,7,8-TCDD is characterized by an extremely low vapor pressure, high log octanol-water coefficient (log K_{ow}), high organic-carbon coefficient (K_{oc}), and extremely low water solubility. Given its high K_{oc} and log K_{ow}, 2,3,7,8-TCDD is expected to be strongly sorbed to soil particles. It is more tightly bound to soils with higher organic content, with soil binding increasing as a function of time (Kearney *et al.* 1972; Matsumara and Benezet 1973). Only slightly soluble in water, its migration in soil occurs mainly with soil colloids and particles to which it is bound. Its strong adsorption to soil, low water solubility, and high K_{oc} indicate that its rate of transport from unsaturated zone soils to the water table via rain infiltration would be extremely low. Increased vertical movement in soil may occur as a result of saturation of sorption sites, migration with organic solvents, and human activities. The medium that 2,3,7,8-TCDD is dispersed in during soil application or environmental release has also been shown to affect its sorption on soil. Since the solubility of 2,3,7,8-TCDD in organic solvents is generally greater than in water, partitioning to soils is likely to be greater than the amount available to the mobile liquid phase.

The low vapor pressure indicates that volatilization from soils would occur at extremely low rates. Also, low rates of physical or biological degradation indicate that TCDDs would be highly persistent in soils. Although extensive volatilization of 2,3,7,8-TCDD is not expected, several studies have demonstrated volatility of 2,3,7,8-TCDD from soil in both the laboratory and the field (Podoll *et al.* 1986; Freeman and Schroy 1986;

Palausky *et al.* 1986). Depth of initial disposal will affect the apparent half-life of dioxin in soil, since volatilization is largely a surface phenomenon. Volatilization from soil surfaces during warm, summer months may be a major mechanism by which 2,3,7,8-TCDD is removed from soil. Volatilization during cold, winter months or from soil depths several centimeters below the boundary layer is extremely slow (OHM/TADS 1994).

When 2,3,7,8-TCDD is exposed to sunlight on terrestrial surfaces, it may be susceptible to photodegradation; however, soil is expected to exert a protective effect against photolytic degradation. Dioxins have exhibited relatively strong resistance to microbial degradation in soils (Freeman and Schroy 1984; Matsumara and Benezet 1973). Of 100 strains of microorganisms that had previously been shown to degrade persistent pesticides, only five strains exhibited ability to degrade 2,3,7,8-TCDD (Matsumara and Benezet 1973). Worm-worked soils had 2,3,7,8-TCDD retention times of 80 to 400 days, suggesting that earthworms may significantly alter half-life patterns of 2,3,7,8-TCDD in soils (Eisler 1986a).

Due to 2,3,7,8-TCDDs strong sorptive properties, low water solubility, high K_{oc}, and the high organic carbon content (8.6%) of undeveloped landfill surface soil, migration vertically or laterally by 2,3,7,8-TCDD is unlikely; therefore, 2,3,7,8-TCDD is expected to be retained in the upper surface soil horizons at the site. Also, due to the topography and extensive vegetative cover on the undeveloped landfill, transport of 2,3,7,8-TCDD off-site via surface water runoff is unlikely except under flood conditions.

Aquatic sediments may be an important, and ultimate, environmental sink for all global releases of 2,3,7,8-TCDD (Eisler 1986a). Due to a low rate of degradation and high K_{oc}, 2,3,7,8-TCDD is expected to be highly persistent in most sediments.

The compound 2,3,7,8-TCDD has been shown to biomagnify in terrestrial organisms. However, all dioxin isomers do not bioaccumulate to the extent of 2,3,7,8-TCDD. There are limited data which suggest that 2,3,7,8-TCDD does not bioaccumulate in crop plants (ATSDR 1989c). In studies on terrestrial invertebrates, earthworms accumulated five times the concentration of 2,3,7,8-TCDD in soil in seven days. Although there presently is no evidence of biomagnification of TCDDs in birds, it is speculated that piscivorous birds have a greater potential to accumulate TCDDs than the fish that they eat. In mammals, accumulation of 2,3,7,8-TCDD has been reported in the liver of rats (Eisler 1986a).

Based on the biomagnification potential of 2,3,7,8-TCDD, exposure of terrestrial and aquatic wildlife is likely to occur through the ingestion of contaminated soil and sediment, respectively, and subsequent biota translocation.

Fate of Cadmium in Environmental Media

This section presents the fate of cadmium in Florida Avenue Canal sediment and its potential for bioaccumulation and/or biomagnification in the aquatic food chain. Cadmium was selected as an SOPC in undeveloped landfill surface soil for the Phase II ERA; fate and transport characteristics of cadmium in soils is presented in Section U.2.2.5.2 of the Phase I ERA.

Studies indicate that concentrations of cadmium in sediments are at least one order of magnitude higher than in the overlying water (ATSDR 1993c). Cadmium in surface waters tends to adsorb to sediments with subsequent desorption, depending on specific conditions. Adsorption and desorption rates of cadmium are rapid on mud solids and particles of clay, silica, humic material, and other naturally occurring solids (Eisler 1985a). Cadmium may be redissolved from sediments under varying ambient conditions of pH, salinity, and redox potential (ATSDR 1993c).

Changes in physiochemical conditions, especially pH and redox potential (that occur during dredging and disposal of cadmium-polluted sediments) may increase chemical mobility and bioavailability of sediment-bound cadmium. Under comparatively acidic pH and high oxidation conditions, river sediments have been transformed from organic forms of cadmium to more mobile and readily available dissolved and exchangeable forms (Eisler 1985a). However, due to the relatively neutral pH of Florida Avenue Canal sediment (7.7), transformation to dissolved and exchangeable forms of cadmium is unlikely.

Another potential transport mechanism for cadmium-contaminated sediments is via plant uptake. It is possible that significant amounts of cadmium are transferred from the sediments into rooted aquatic macrophytes and later released into the water after macrophyte death, particularly in heavily contaminated systems (Eisler 1985a). Because no aquatic macrophytes were observed in the Florida Avenue Canal, this transport mechanism for cadmium is not possible.

Studies indicate that cadmium bioaccumulates in all levels of the aquatic food chain, but biomagnification usually occurs only in the lower trophic levels (ATSDR 1993c) (Eisler 1985a). Little information, specific to bioaccumulation and biomagnification potential in sediments, was available for cadmium. Bioaccumulation/biomagnification properties for cadmium in aquatic environments are similar to trends observed for terrestrial environments (ATSDR 1993c) (Section U.2.2.5.2 of the Phase I ERA). Based on these trends, potential exposure of aquatic wildlife in Florida Avenue Canal to cadmium is expected to be limited to benthic invertebrates associated with the sediment and species that ingest sediment incidentally while foraging. Food chain transfer of cadmium is not expected.

Fate of Copper in Environmental Media

This section presents the fate of copper in undeveloped landfill surface soil and in Florida Avenue Canal sediment and its potential for bioaccumulation and/or biomagnification in the terrestrial and aquatic food chains. Copper may exist in the natural environment in its elemental state, as sulfides, arsenites, chlorides, carbonates, or oxides (HSDB 1994). In general, copper and its compounds are adsorbed more strongly to soils with high clay content, high organic carbon content, and low pH (HSDB 1994). Copper has been shown to be most mobile at a pH of less than 3 and only slightly mobile at a pH of 4.5 or greater (Tyler 1978). Therefore, based on the average pH (8.2) and total organic carbon content (8.6%) of undeveloped landfill surface soil, copper is expected to be retained in the upper surface soil horizons and is not expected to migrate to groundwater. Also, because the site is below sea level in areas and dense vegetation covers the site, transport of copper via surface water induced erosion is also expected to be limited.

The aquatic transport and fate of copper depends upon pH, availability of other ions, ligands or sorbents present in the water, and redox potential (EPA 1987). Acidic conditions promote the solubility of copper and alkaline conditions favor the formation of copper precipitates (HSDB 1994). The solubility of elemental copper in water is very low, but copper compounds such as chlorides and sulfates, may be more soluble. The formation of copper compounds is dependant upon which ligands are present in the vicinity of the copper ion. In one aquatic system, most of the copper present was bound to the bottom sediments

(Gibbs 1973). This study, in conjunction with the high likelihood of adsorption, and a relatively neutral pH (7.7), suggests that any copper associated with the Florida Avenue Canal is most likely adsorbed to the thin layer of bottom sediment.

Bioaccumulation and biomagnification of copper in the terrestrial and aquatic food chains are not expected (ATSDR 1990c). No evidence of bioaccumulation was obtained from a study of pollutant concentrations in the muscle and livers of 10 mammal species in Donana National Park in Spain. Even at the lowest levels of the food chain, there is little evidence of copper bioaccumulation. Therefore, potential exposure of terrestrial and aquatic wildlife on the undeveloped landfill and in Florida Avenue Canal is likely to be limited to those species which ingest soil and sediment incidentally while foraging.

Fate of Iron in Environmental Media

This section presents the fate of iron in undeveloped landfill surface soil and in Peoples Avenue Canal surface water and its potential for bioaccumulation and/or biomagnification in the terrestrial and aquatic food chains. General transport principles of divalent elements were applied in predicting the fate of iron in these two media because very few data were located on the transport and fate characteristics of iron in the natural environment. Iron and its compounds are expected to be adsorbed more strongly to soils with high clay content, high organic carbon content, and neutral pH. Iron may be mobile at both low and high pH. Therefore, based on the average pH (8.2) and total organic carbon content (8.6%) of undeveloped landfill surface soil, iron is expected to be retained in the upper surface soil horizons and is not expected to migrate vertically to groundwater. Also, because the site is below sea level in areas and dense vegetation covers the site, transport of iron via surface water induced erosion is also expected to be limited.

The aquatic transport and fate of iron depends upon pH, availability of other ions, ligands or sorbents present in the water, and redox potential. Acidic conditions promote the solubility of elements, and alkaline conditions favor the formation of precipitates (HSDB 1994). Based on the average pH of Peoples Avenue Canal surface water (7.0), the solubility of elemental iron is suspected to be very low. However, iron compounds may be more soluble. The formation of iron compounds is dependant upon which ligands are present in the

vicinity of the copper ion. The mobile portion of iron in water may be in the form of organic complexes, and/or adsorbed to suspended particulates (Gibbs 1973). Information on the potential bioaccumulation and/or biomagnification of iron in the terrestrial and aquatic food chains was unavailable.

Fate of Lead in Environmental Media

This section presents the fate of lead in Florida Avenue Canal surface water and sediment and Peoples Avenue Canal sediment and its potential for bioaccumulation and/or biomagnification in the aquatic food chain. Lead was selected as an SOPC in undeveloped landfill surface soil for the Phase II ERA; fate and transport characteristics of lead in soils are presented in Section U.2.2.5.2 of the Phase I ERA.

Lead may enter surface waters as a result of erosion and/or surface water runoff. In water, lead is most soluble and bioavailable under conditions of low pH, low organic content, low concentrations of suspended sediments, and low concentrations of the salts of calcium, iron, manganese, zinc, and cadmium. Lead tends to dissolve in waters with a pH less than 7 and concentrate in the surface water microlayer (i.e., the upper 0.3 mm), especially when surface organic materials are present in thin films (Eisler 1988a). As the alkalinity and pH in water decrease, the amount of lead retained in water increases. Therefore, based on the average pH of Florida Avenue Canal surface water (7.2), lead is not expected to be detected at significant concentrations. The concentration of lead detected in the surface water sample collected adjacent to the site was 7.2 mg/kg.

In water with high concentrations of dissolved organics, lead will remain in solution. However, in waters without substantial amounts of dissolved organics, lead will adsorb to suspended particulates and will settle out (ATSDR 1992a). The ratio of lead in suspended solids to dissolved lead has been found to vary from 4:1 in rural streams to 27:1 in urban streams (ATSDR 1992a).

The movement of lead in aquatic environments is also influenced by lead speciation (ATSDR 1992a). Lead potentially exists in three forms in surface waters: dissolved labile (e.g., Pb^{2+}, $PbOH^{+}$, $PbCO_3$), dissolved bound (e.g., colloids or strong complexes), or as a particulate. The labile forms represent a significant part of the lead input from washout of

atmospheric deposits, whereas particulate bound forms are common in urban runoff (Eisler 1988a). Migration and speciation of lead is strongly affected by water flow rate; increased flow rate results in increased concentrations of particulate and labile lead and a decrease in bound forms. At low stream flow, lead is rapidly removed from the water column by sedimentation (ATSDR 1992a).

Most lead entering natural waters is precipitated to the sediment bed as carbonates or hydroxides (Eisler 1988). In sediment, lead strongly complexes to naturally occurring organic materials and adsorbs to inorganic solids. When complexing with organic materials, lead increases its adsorptive affinity for clays and other mineral surfaces. Lead is mobilized and released when the pH decreases suddenly or ionic composition changes (Eisler 1988a).

Benthic microbes can methylate lead to form tetramethyl lead, which is volatile and more toxic than inorganic lead. This methylation process may provide a mechanism for the remobilization of lead in the bed sediment (ATSDR 1992a).

Lead may be bioaccumulated by plants and animals in the aquatic environment, but biomagnification has not been detected (ATSDR 1992a). In aquatic organisms, lead concentrations are usually highest in benthic organisms and algae, and lowest in upper trophic level predators (e.g., carnivorous fish) (ATSDR 1992a). Exposure of aquatic wildlife to lead in Florida Avenue Canal and Peoples Avenue Canal is expected to be limited to benthic invertebrates associated with the sediment and species that ingest sediment incidentally while foraging. Food chain transfer of lead is not expected.

Fate of Mercury in Environmental Media

This section presents the fate of mercury in Peoples Avenue Canal sediment and its potential for bioaccumulation and/or biomagnification in the aquatic food chain. Mercury was selected as an SOPC in surface soil for the Phase II ERA; the fate and transport characteristics of mercury in undeveloped landfill surface soil are presented in Section U.2.2.5.2 of the Phase I ERA.

The dominant process controlling the distribution of mercury compounds in the environment appears to be the sorption of nonvolatile forms to sediment particulates (Eisler 1987b). Mercury, in its inorganic form, is not readily desorbed. Thus, fresh water sediments

are important repositories for inorganic forms of the compound. Sorption of mercury to sediment has been found to be related to the organic matter content of the sediment. Mercury forms stable complexes with organic compounds (ATSDR 1992b).

Transformation of mercury in the environment is caused by biotic and abiotic oxidation and reduction, bioconversion of organic and inorganic forms, and photolysis of organomercurials. Elevated levels of chloride ions reduce methylation of mercury in river sediments, sludge, and soil, although increased levels of organic carbon and sulfate ions increase methylation in sediments. In freshwater ecosystems, the presence of chloride ions may accelerate the release of mercury from sediments into the water column (ATSDR 1992b).

Mobilization of sorbed mercury can be caused by bioreduction to elemental mercury and bioconversion to more volatile or soluble forms, such as methylmercury. Mercury methylation in ecosystems depends on mercury loadings, microbial activity, nutrient content, pH and redox conditions, suspended sediment load, sedimentation rates, and other variables (Eisler 1987b). Conversion of inorganic mercury to methylmercury is favored by low pH and low dissolved organic carbon levels (ATSDR 1992b). Based on the average pH of Peoples Avenue Canal sediment (7.6), conversion of inorganic mercury in the sediment to methyl-mercury is not expected.

Mercury bioaccumulation and biomagnification have been demonstrated in the aquatic food chain. In organisms near the top of the food chain, such as carnivorous fishes, almost all mercury accumulated is in the methylated form, primarily as a result of the consumption of prey containing methylmercury (Eisler 1987b). The biomagnification of mercury has been demonstrated by the elevated levels found in piscivorous fish compared with organisms lower on the food chain (ATSDR 1992b). Potential exposure and uptake of mercury in the aquatic food chain of Peoples Avenue Canal is likely to occur through food chain transfer from benthic invertebrates associated with the sediment to higher trophic level species that feed on these sediment dwelling species.

Summary of Potential Transport Pathways of Site-Related Stressors

Based on a qualitative evaluation of the above SOPCs, it appears that the majority are expected to be retained in the upper soil horizons and not migrate laterally or vertically. The

volatile organic SOPCs have the greatest potential to migrate to groundwater. In addition, the majority of SOPCs evaluated have the potential to be bioaccumulated by lower trophic level species, and several may be biomagnified in the terrestrial and aquatic food chains. Therefore, exposure of terrestrial and aquatic wildlife to surface soil SOPCs on the undeveloped landfill and surface water and sediment SOPCs in Florida Avenue Canal and Peoples Avenue Canal will most likely occur through the ingestion of soil and sediment and subsequent biota translocation in each respective food chain.

U.3.2.8 Identification of Known Effects of Site-Related Stressors

The introduction to this section is presented in Section U.2.2.6 of the Phase I ERA. Several of the SOPCs evaluated in Section U.3.2.7.2 were evaluated in the Phase I ERA for a different media. The toxicological reviews for those SOPCs are presented in Section U.2.2.6 of the Phase I ERA.

Toxic Effects of Bis(2-ethylhexyl)phthalate to Terrestrial and Aquatic Wildlife

In general, information on the effects of bis(2-ethylhexyl)phthalate exposure to terrestrial or aquatic wildlife was unavailable.

Toxic Effects of 1,2-Dichloroethene to Terrestrial Wildlife

Symptoms associated with lethal doses of trans-1,2-dichloroethene in rats and mice include severe pulmonary hyperemia and alveolar septal distension, ataxia, depressed respiration, and central nervous system depression (ATSDR 1992j). It is not clear whether this pathology represents a primary effect of the chemical on the lung or is secondary to disruption of cardiovascular function prior to death. Necropsy of mice that received lethal doses of trans-1,2-dichloroethene revealed hyperemia of the stomach and small intestines.

Liver pathology has been demonstrated in rats exposed to lethal or near lethal doses of trans-1,2-dichloroethene. It has been speculated that the inhibition of the enzymes of the citric acid cycle might play a role in the liver toxicity of 1,2-dichloroethene. In addition, biochemical changes in the liver have been reported in mice and rats. However, a connection

between these changes and pathology has not been established. As such, the effects cannot be classified as adverse or as being indicative of liver toxicity.

The few studies on the effects of 1,2-dichloroethene on the kidney that have been reported provide evidence to suggest that the kidney is probably not a primary target for toxicity. Neurological effects in animals have not been examined.

Toxic Effects of Methylene Chloride to Terrestrial and Aquatic Wildlife

Information on the effects of methylene chloride exposure to terrestrial or aquatic wildlife was unavailable.

Toxic Effects of Heptachlor to Terrestrial and Aquatic Wildlife

Heptachlor is a known neurotoxic agent which may result in convulsions if provided at high enough doses (ATSDR 1993k). Therefore, it may be expected that wildlife exposed to heptachlor may exhibit abnormal behavior, which may result in increased predation and potentially, decreased survival for the exposed populations. Other sub-lethal effects may include systemic effects which are unlikely to result in population level effects. Heptachlor is also acutely toxic to wildlife species, but since it is no longer used as an agricultural pesticide high level acute exposure should not occur.

Toxic Effects of Copper to Terrestrial and Aquatic Wildlife

Elevated copper concentrations can affect both terrestrial and aquatic ecosystems, causing changes in community structure and nutrient cycling. Several studies conducted concerning heavy metal effects on microbial and fungal activity in soils found that copper and other metals inhibited mineralization of nitrogen and phosphorous in contaminated forest soils. In addition, lower fungal species diversity was reported in soils contaminated with heavy metals; copper was found to be more toxic to these species than the other metals (EPA 1987).

Certain plant species (e.g., lichens and mosses) are especially sensitive to copper, and elevated levels may cause elimination of sensitive species and selection of resistant ones, thereby changing community composition and species diversity.

In the aquatic environment, acute toxicity of copper is greatly affected by water chemistry; the toxicity decreases with increasing hardness and alkalinity. Chronic toxicity, however, is not strongly affected by these parameters. Some of the more sensitive aquatic species include daphnids, scuds, midges (chironomids), and snails (EPA 1987).

Toxic Effects of Iron to Terrestrial and Aquatic Wildlife

Information on the effects of iron exposure to terrestrial or aquatic wildlife was unavailable.

Toxic Effects of PCBs to Terrestrial Wildlife

PCBs elicit a variety of biologic and toxic effects including skin lesions, wasting syndrome, immunotoxicity, reproductive toxicity, genotoxic and epigenetic effects, hepatomegaly and related liver damage, and the induction of hepatic and extrahepatic drug-metabolizing enzymes. PCB accumulations from the diet and from other sources are high, and retention is lengthy in fatty tissues. Interspecies differences in sensitivity to PCBs are large, even between species that are closely related taxonomically (ATSDR 1989l).

In mammals, PCBs appear to have a low order of acute lethality. PCBs, however, are lethal at much lower total doses when administered subchronically or chronically, indicating that PCBs bioaccumulate to concentrations that are toxic. Studies in animals have shown that the liver and cutaneous tissues are the major target organs of PCBs. PCBs appear to be fetotoxic but not teratogenic in various species of mammals, including rats, mice, rabbits, and monkeys. The possibility that other contaminants (e.g., polychlorinated dibenzofurans) may be responsible for the effects should be recognized (ATSDR 1989l).

Among sensitive avian species, PCBs disrupt normal patterns of growth, reproduction, metabolism, and behavior. Other toxic effects include: liver hyperplasia, hypertrophy, and/or necrosis, enzyme induction, hemorrhage and tubular dilation of the kidneys, defeathering and dermatitis, edema, depression of secondary sexual characteristics, decreased comb weights, weight loss, and lethality. In general, PCB accumulation is rapid and depuration is lengthy. Diet is an important route of PCB accumulation. Concentrations in liver were

highest in birds that feed on fish, followed by species that feed on small birds and mammals, worms and insects, and lowest in herbivorous species.

American kestrels given 33 mg/kg of dietary Aroclor 1254 for 62 to 69 days showed a significant decline in sperm concentration, but no compensatory increase in semen volume. PCB residues in treated kestrels, in mg/kg lipid weight, were 107 in muscle and 128 in testes; for controls, these values were 0.4 and 1.0, respectively. These results suggest that migratory flesh-eating birds, feeding on a PCB-contaminated food chain, might consume enough toxicant to alter their semen quality in that breeding season; when coupled with altered courtship, this could reduce the fertility of the eggs and reproductive fitness of the individual (Eisler 1986b).

Toxic Effects of 2,3,7,8-TCDD to Terrestrial and Aquatic Wildlife

Laboratory studies with birds, mammals, aquatic organisms, and other species have demonstrated that exposure to 2,3,7,8-TCDD can result in acute and delayed mortality as well as teratogenic, mutagenic, histopathologic, immunotoxic, and reproductive effects. These effects vary greatly among species. Typically, animals poisoned by 2,3,7,8-TCDD exhibit weight loss, atrophy of the thymus gland, and eventually death. The toxicological mechanisms of 2,3,7,8-TCDD are not fully understood. Few dioxin toxicity studies have been reported for mammalian and avian wildlife species (EPA 1993b). The mink appears to be the most sensitive mammal evaluated thus far.

In mammals, there appears to be significant interspecies differences in sensitivity to 2,3,7,8-TCDD, with large interspecies differences in lethal dosages and toxic effects. Intraspecies differences in sensitivity to 2,3,7,8-TCDD (up to 14 fold) were reported among three strains of mice. In mammals, 2,3,7,8-TCDD poisoning is typically characterized by loss of body weight and delayed lethality. It produces prominent chloracne-type skin lesions in monkeys, and severe liver damage in rats, mice, and rabbits. Atrophy of the thymus and suppression of the thymus-dependent cellular immunity is a consistent finding in mammals. Developing mammalian fetuses are especially sensitive to 2,3,7,8-TCDD, and maternal exposure results in increased frequencies of stillbirths. Exposure produces teratogenic effects including cystic kidney, cleft palate, and spinal column deformities. It appears that 2,3,7,8-

TCDD has a greater effect on growth, survival, and reproduction of animals than on tumor formation.

Based on currently available data for avian species, it appears that gallinaceous birds are the most sensitive to TCDD; the ring-necked pheasant and the chicken are among the most sensitive. Reproductive effects are of particular concern. Chick edema disease is commonly observed in domestic chickens and herring gull chicks, and is characterized by pericardial, subcutaneous, and peritoneal edema; liver enlargement and necrosis with fatty degeneration; and death.

Summary of Ecological Effects

Generally, information on the effects of volatile organic SOPC exposure to terrestrial and aquatic wildlife was unavailable. Toxicological information available for the other SOPCs suggests that a variety of potential ecological effects could occur as a result of exposure to these SOPCs on the undeveloped landfill and in Florida Avenue Canal and Peoples Avenue Canal. A more thorough review of appropriate toxicological endpoints and TBVs is provided in the ecological effects assessment (Section U.3.3.2).

U.3.2.9 Selection of Ecological Endpoints

A comprehensive discussion of the process and selection of assessment endpoints, measurement species, and measurement endpoints is provided in Sections U.2.2.7.1, U.2.2.7.2, and U.2.2.7.3 of the Phase I ERA.

U.3.2.10 Development of the Refined Ecological Conceptual Site Model

Figure U-5 presents the receptors and pathways selected for the refined ecological conceptual site model for the undeveloped landfill. The hypothesis for the Phase II model is the same as that presented for the Phase I ERA. The model is defined as follows:

- There is a potential for adverse ecological effects to terrestrial wildlife from exposure to chemical SOPCs found in the surface soils of the undeveloped landfill.

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Based upon the site reconnaissance survey and additional information gathered during the ecological investigation, potential adverse effects to aquatic and semi-aquatic wildlife from exposure to SOPCs within Florida Avenue Canal and Peoples Avenue Canal surface water and sediment will not be evaluated in the remaining sections of the Phase II ERA. Florida Avenue Canal does not contain suitable habitat to sustain viable populations of aquatic or semi-aquatic receptors. During the ecological reconnaissance survey, no ecological receptors were observed utilizing this canal at any time.

In Peoples Avenue Canal, there was some evidence that selected receptors may utilize the northern portion of this canal; however, it was not evaluated in the subsequent sections of the Phase II ERA based on the following rationale.

- It is periodically dredged. Even when it is not dredged, heavy rain events likely scour the canal sufficiently so that contaminant concentrations fluctuate, and presence of the contaminants themselves are likely to fluctuate.

- Based on the volatile nature of the canal, a one-time sampling event of four colocated surface water/sediment samples (two upgradient and two downgradient) is insufficient to adequately, quantitatively, characterize potential ecological risks to aquatic or semi-aquatic wildlife within the canal.

- Maximum downgradient sediment SOPC concentrations did not exceed Ontario Sediment Quality Guidelines by more than an order of magnitude for the majority of the sediment SOPCs detected.

- The large number of drainage outfalls adjacent to the site within both canals makes it impossible to prove absolute or even probable attribution to the site. Because both of these canals drain an extensive area, potential sources of chemicals within the canals are numerous.

- During a recent sampling event at the site (E & E 1995), maintenance personnel were observed spraying 2,4-D on the embankments of Peoples Avenue Canal.

U.3.3 ANALYSIS

The analysis phase of the ERA evaluates receptor exposure to SOPCs (see Section U.3.3.1) and the toxicological effects associated with each SOPC on the measurement species

and communities identified during the problem formulation (see Section U.3.3.2). These activities are conducted interactively to ensure that the methods used to evaluate exposure and effects are compatible. Analysis of exposure and effects is based on the ecological endpoints and the focused conceptual site model derived during problem formulation (see Section U.3.2.10).

U.3.3.1 Exposure Assessment

The exposure assessment for the undeveloped landfill involves quantifying potential exposure to site-related SOPCs by measurement species and communities identified in the problem formulation (see Section U.2.2.7). To derive these estimates, assumptions were made regarding the selected species' contact with and uptake of SOPCs. Exposure parameters were derived from published literature values. The exposure assessment is divided into the following sections:

- Exposure Point Concentrations (see Section U.3.3.1.1); and
- Exposure Estimates (see Section U.3.3.1.2).

U.3.3.1.1 Exposure Point Concentrations

The exposure medium of ecological concern on the undeveloped landfill is surface soil. For this medium, the average and Reasonable Maximum Exposure (RME) cases were considered. In all, a total of 52 grid surface soil samples (0 to 3 inches) were collected from the undeveloped landfill. At 18 of these grid locations, a second surface soil sample (0 to 24 inches) was collected solely for the ERA (See Section U.2.2.3 of the Phase I ERA). The 18 0-to 24-inch surface soil grid samples were utilized instead of 0-to 3-inch grid samples where these two samples were colocated. Therefore, of the 52 total surface soil samples used in the calculation of EPCs for the undeveloped landfill, 34 were 0- to 3-inch samples, and 18 were 0- to 24-inch samples. The mean and 95% Upper Confidence Limit (95% UCL) exposure point concentrations (EPCs) for the undeveloped landfill were used to estimate the average and RME exposure cases for undeveloped landfill surface soil. In cases where the 95% UCL

exceeded the maximum detected concentration, the maximum concentration was used (Table V-44). Following Region 6 EPA guidance (EPA 1992d), surface soil data on the undeveloped landfill was assumed to be lognormally distributed.

For the calculation of dioxin mean and 95% UCL EPCs, 2,3,7,8-TCDD toxicity equivalency factors (TEFs) were applied to each dioxin congener in undeveloped landfill surface soil samples. Then, after 2,3,7,8-TCDD toxicity equivalents were calculated for each congener in each sample, toxicity equivalents were summed across congeners in each sample to derive total 2,3,7,8-TCDD toxicity equivalent values for individuals samples. Total 2,3,7,8-TCDD toxicity equivalents for individual samples were then used to estimate mean and 95% UCL EPCs. Table V-42 provides a list of mean and 95% UCL exposure point concentrations calculated for the undeveloped landfill in the Phase II ERA.

U.3.3.1.2 Exposure Estimates

Exposure assumptions for both measurement communities (plants and soil macroinvertebrates) used in the Phase II ERA are identical to those used during the Phase I ERA (see Section U.2.3.1.2). For the Phase II ERA, the estimation of exposure doses for measurement species was based on average exposure parameters. The methodologies and assumptions for the derivation of food chain transfer factors for measurement species are identical to those presented in the Phase I ERA. Section (U.2.3.1.2) of the Phase I ERA presents a description of food chain transfer factors. Tables V-43 through V-46 provide estimates for plant, earthworm, shrew, and robin tissue concentrations, respectively, based on RRII surface soil EPCs.

Exposure Assumptions for the Short-Tailed Shrew. The shrew is carnivorous and is potentially exposed to SOPCs in undeveloped landfill surface soil through ingestion of macroinvertebrates that have potentially bioaccumulated SOPCs found in the soil (see Section U.2.3.1.2 of the Phase I ERA, Vegetation, Earthworm, and Insect Bioaccumulation Factors) and through direct ingestion of contaminated soil. The exposure algorithms used to evaluate these exposure pathways are described below.

For this assessment, potential exposure to the shrew from SOPCs was evaluated based on the consumption of earthworms. Although the diet of the shrew does not consist entirely of earthworms, they were used to represent all soil macroinvertebrates in estimating exposure, since (1) the earthworm is one of the few invertebrates for which bioaccumulation of SOPCs can be readily estimated, and (2) earthworms would be expected to significantly bioaccumulate selected SOPCs found in surface soil as a result of both dermal absorption and soil ingestion.

In order to calculate an exposure estimate of earthworm ingestion by the shrew, the following exposure parameters were derived: body weight, ingestion rate, percentage of diet made up by each dietary item, site use factor, and exposure duration. A body weight of 0.017 kilograms and a wet weight ingestion rate of 0.01 kilograms per day was assumed for the shrew, based on an average of reported body weights and ingestion rates, respectively (EPA 1993a). In order to convert this ingestion rate to dry weight, a moisture value of 80% was estimated for the shrew's prey (Beyer 1994). Multiplying the dry weight percentage (20%) by the wet weight ingestion rate yields a dry weight ingestion rate of 0.002 kilograms per day. The dietary intake of the shrew is assumed to occur entirely on the undeveloped landfill, since its maximum home range of 1.5 acres (EPA 1993a) falls within the boundaries of the undeveloped landfill. Therefore, the site use factor (calculated by dividing the site area by the home-range area [to a maximum of 1.0]) for the shrew is 1. The shrew is also considered to be a year-round resident; therefore, its exposure duration is 1.

The shrew is also potentially exposed to SOPCs through the incidental ingestion of soil while foraging. All exposure parameters derived for the earthworm exposure dose, except percentage of diet represented, were used for the estimation of a soil exposure dose. Soil ingestion for the shrew was calculated as a percentage of its total daily dietary intake. Because a species-specific soil ingestion rate was unavailable for the shrew, a value was obtained from a species with similar feeding habits. A soil ingestion rate of 10.4% of the shrew's daily dietary intake was estimated from a value reported for a woodcock, which also feeds on soil macroinvertebrates (EPA 1993a). Based on this percentage, a dry weight soil ingestion rate of 0.0002 kilograms per day was calculated for the shrew. The exposure

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parameters for the shrew are presented in Table V-47. Exposure doses for the shrew are presented in Table V-48.

Exposure Assumptions for the American Robin. The robin is omnivorous and is potentially exposed to SOPCs in undeveloped landfill surface soil through the ingestion of macroinvertebrates and fruit (EPA 1993a) that have potentially bioaccumulated SOPCs from the soil and through direct ingestion of soil (see Section U.2.3.1.2 of the Phase I ERA, Vegetation, Earthworm, and Insect Bioaccumulation Factors). The exposure algorithms used to evaluate these exposure pathways are described below.

As with the shrew, macroinvertebrate ingestion by the robin does not entirely consist of earthworms, but for the same reasons presented for the shrew, it is assumed that earthworms represent the primary macroinvertebrate species consumed by the robin at the site.

In order to calculate exposure estimates of earthworm and fruit ingestion by the robin, the following exposure parameters were derived: body weight, ingestion rate, percentage of diet made up by each dietary item, site use factor, and exposure duration. A body weight of 0.082 kg and a wet weight ingestion rate of 0.02 kg per day was assumed for the robin, based on an average of reported body weights and ingestion rates, respectively (EPA 1993a). Again, as in the case for the shrew, a dry weight ingestion rate was calculated using a food moisture value of 80% (Beyer 1994). Based on this value, a dry weight ingestion rate of 0.004 kilograms per day was calculated for the robin. In order to estimate the ratio of earthworms to fruit consumed daily by the robin, food item consumption data were evaluated (EPA 1993a). Based on seasonal averages during a one-year period, earthworms and fruit were assumed to each make up 50% of the robin's diet. The dietary intake of the robin is assumed to occur entirely on the undeveloped landfill, since its maximum home range of 2 acres (EPA 1993a) falls within the boundaries of the undeveloped landfill. Therefore, the site use factor for the robin is 1. An exposure duration value of 1.0 was used for the robin because it was conservatively assumed to be a year-round resident.

The robin is also potentially exposed to SOPCs through the incidental ingestion of soil while foraging. All exposure parameters derived for the earthworm and fruit exposure doses, except percentage of diet represented, were used for the estimation of a soil exposure

dose. Soil ingestion for the robin was calculated as a percentage of its total daily dietary intake. Because a species-specific soil ingestion rate was unavailable for the robin, a value was obtained from a surrogate species with similar feeding habits. A soil ingestion rate of 10.4% of the robin's total daily diet was estimated from a value reported for a woodcock, which also feeds on soil macroinvertebrates. Based on this percentage, a soil ingestion rate of 0.0004 kilograms per day was calculated for the robin. The exposure parameters for the robin are presented in Table V-47. Exposure doses for the robin are presented in Table V-49.

Exposure Assumptions for the American Kestrel. The kestrel is carnivorous and is potentially exposed to SOPCs in undeveloped landfill surface soil through the ingestion of small mammals, birds, and insects that have potentially bioaccumulated SOPCs found in undeveloped landfill surface soil (see Section U.2.3.1.2 of the Phase I ERA, Vegetation, Earthworm, and Insect Bioaccumulation Factors and Shrew and Robin Bioaccumulation Factors). The exposure algorithms used to evaluate these exposure pathways are described below.

For this assessment, potential exposure of the kestrel to SOPCs was evaluated based on consumption of shrews, robins, and insects. Although it is unlikely that shrews and robins represent all of the small mammal and bird species consumed by the kestrel, these species are potentially maximally exposed to SOPCs because they feed on soil macroinvertebrates that may accumulate significant amounts of SOPCs from undeveloped landfill surface soil.

In order to calculate an exposure estimate of shrew and robin ingestion by the kestrel, the following exposure parameters were derived: body weight, ingestion rate, percentage of diet made up by each dietary item, site use factor, and exposure duration. A body weight of 0.114 kilograms and a wet weight ingestion rate of 0.019 kilograms per day was assumed for the kestrel, based on an average of reported body weights and ingestion rates, respectively (EPA 1993a). In order to convert this ingestion rate to dry weight, a moisture value of 71.4% was used for the kestrel's prey (Talmage and Walton 1991). Multiplying the dry weight percentage (26%) by the wet weight ingestion rate yields a dry weight ingestion rate of 0.005 kilograms per day. In order to estimate the percentages of small mammals, birds, and

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insects consumed daily by the kestrel, food item consumption information for kestrels inhabiting urban environments was evaluated (Brack *et al.* 1984). Based on several months of daily observations over the course of a two-year period, it was determined that the daily percentages of small mammal, bird, and insect ingestion are, on average, 47%, 52%, and 1%, respectively. The undeveloped landfill is expected to represent approximately 22% of the kestrel's foraging habitat due to its extensive home range (180 acres) (EPA 1993a). Therefore, the site use factor for the kestrel is 0.22. An exposure duration value of 1.0 was used for the kestrel because it was conservatively assumed to be a year-round resident. The exposure parameters for the kestrel are presented in Table V-47. Exposure doses for the kestrel are presented in Table V-50.

U.3.3.2 Ecological Effects Assessment

The approach for the ecological effects assessment in the Phase II ERA is presented in Section U.2.3.2 of the Phase I ERA. It describes the selection of TBVs and the use of safety factors in the calculation of TRVs for new SOPCs identified during the Phase II ERA. Ecotoxicological effects profiles for SOPCs identified only in the Phase II ERA are presented in this section. Tables V-20 through V-24 provide TBVs for measurement species, phytotoxity data for vegetation, soil macroinvertebrate toxicity data, safety factors and the approach for the derivation of TRVs, and TRVs for measurement species, respectively.

U.3.3.2.1 Volatile Organic Compounds

1,1-Dichloroethene (DCE) and 1,2-DCE. Hepatic, renal, and gastrointestinal damage are all endpoints for acute DCE exposure (ATSDR 1993m). Acute, oral LD_{50}s for 1,1-DCE vary from 194 mg/kg-bw for mice to 1,550 mg/kg-bw for rats (ATSDR 1993m). For trans-1,2-DCE, the mouse oral LD_{50} was calculated to be 2,122 mg/kg-bw for males and 2,391 mg/kg-bw for females (Barnes *et al.* 1985). The rat oral LD_{50} for the 1,2-isomer is 770 mg/kg-bw (RTECS 1994). The LD_{50} for acute exposure to 1,1-DCE was 50 mg/kg-bw (Anderson and Jenkins 1977). Chronic exposure to 19.3 mg/kg-bw 1,1-DCE over two years induced hepatic cytoplasmic damage in rats (ATSDR 1993m). A NOAEL for hepatic effects was 10 mg/kg; while the NOAEL for renal and other systemic effects was 25 mg/kg-bw and

the NOAEL for 1,1-DCE reproductive effects was 30 mg/kg-bw (ATSDR 1993m). Significant effects were noted on renal or hepatic systems in mice after exposure to 175 mg/kg-bw 1,2-DCE for 90 days (LOAEL) but no systemic effects were seen in mice at 17 mg/kg-bw (Barnes *et al.* 1985). No toxicity data were found for avifauna, vegetation, or soil invertebrates.

Methylene Chloride. Methylene chloride is also known as dichloromethane and is used as an organic solvent and a paint stripper. Methylene chloride is a central nervous system (CNS) depressant and the general mechanism of toxicity appears to be the direct CNS anesthesia and formation of carbon monoxide (CO) during the biodegradation of methylene chloride in situ (ATSDR 1989b). The carbon monoxide reduces the bloods ability to supply oxygen, which results in CNS depression. Mild effects on the liver may also result in small mammals (ATSDR 1989b).

The acute oral LD_{50} for methylene chloride for rats and mice is approximately 2,000 mg/kg-bw (Aviado *et al.* 1977; Kimura *et al.* 1971). Rabbits may be slightly more sensitive than rats and mice with a reported LD_{LO} of 1,900 mg/kg-bw (RTECS 1994). Potential effects of methylene chloride on the liver are substantiated by ATSDR 1989b, who found biochemical changes (decreased cytochrome P-450) in rat livers after 18-hour acute exposure to 1,000 mg/kg-bw and reduced triglyceride secretion and tubulin protein content in mouse livers at 2,700 mg/kg-bw. Chronic 78-and 104-week studies found slight effects (increased incidence of foci and fatty liver changes; LOAEL) on the livers of rats at 50 - 125 mg/kg-bw/day, and 5 mg/kg-bw/day was established as a NOAEL (ATSDR 1989b). Longer, 2-year studies with similar species and hepatotoxic endpoints, found a NOAEL of 185 mg/kg-bw/day and a LOAEL of 250 mg/kg-bw/day when methylene chloride was provided in drinking water (Anderson *et el.* 1987). In a two generation reproduction study, adult rats were orally dosed by gavage at 225 mg/kg-bw/day for 18 weeks (HSDB 1994). These adult rats were mated 1 to 1 and the offspring were exposed to the same concentration of methylene chloride in their diet for 90 days. No effects were seen in behavior and appearance, food consumption, ophthalmoscopy, hematology, biochemical and urinalysis studies, fertility indices, number of pups/litter or pup survival. No developmental or teratogenic effects were noted in two

inhalation exposure pathway experiments (ATSDR 1989b; Schwetz *et al.* 1975). The 225 mg/kg-bw/day chronic NOAEL for rats (HSDB 1994) was selected as the TBV for methylene chloride for mammals. Some slight liver changes may be associated with this treatment level, but these potential changes are not considered as ecologically significant as the reproductive study results.

No data were located regarding the toxic effects of methylene chloride to birds, soil macroinvertebrates, or terrestrial vegetation.

U.3.3.2.2 Semivolatile Organic Compounds

Bis(2-ethylhexyl)phthalate. Bis(2-ethylhexyl)phthalate is also called di(2-ethylhexyl)-phthalate (DEHP). Phthalate esters such as DEHP are used in plastics manufacturing to keep the plastic more flexible. Plastics may contain up to 40% DEHP (ATSDR 1989a).

The target organs for DEHP toxicity appear to be the liver and testes. DEHP is broken down by hydrolytic and glucoronidation processes to alcohols and carboxylic acids, which are rapidly cleared from the body, mainly via urine and bile. The rapid elimination indicates little capability for bioaccumulation of DEHP in biological tissues. The mode of toxicological action is currently unknown (ATSDR 1989a); however, one of the breakdown products [mono(2-ethylhexyl)phthalate (MEHP)] may be more toxic than DEHP (HSDB 1994). Another metabolic process produces 2-ethylhexanoic acid (2-EHA) which appears to be the compound responsible for any teratogenic effects (HSDB 1994).

The acute oral LD_{50} for DEHP ranges from 26,000 mg/kg-bw for mice (Patty 1967) and guinea pigs (RTECS 1994) to 30,600 mg/kg-bw for rats (Shaffer *et al.* 1945) and 34,000 mg/kg-bw/day for rabbits (RTECS 1994). A single dose of 1,000 mg/kg-bw was lethal to suckling and weanling rats (Dostal *et al.* 1987). Based upon these values, DEHP has a low order of acute toxicity but may be more toxic during postnatal development.

Acute hepatotoxicity was not observed in mice exposed at doses up to 20,000 mg/kg-bw/day over 14 days (NTP 1982); however, 100 mg/kg-bw/day and 1,000 mg/kg-bw/day resulted in increased liver weights (LOAEL) in rats and hamsters, respectively, exposed for the same time period (Lake *et al.* 1984). A NOAEL for the rat was set at 25 mg/kg-bw/day and at 250 mg/kg-bw/day for the hamster. Over a 9-month study period, Mitchell *et al.*

(1985) found a rat LOAEL of 50 mg/kg-bw/day for histological and biochemical hepatotoxicity; and Carpenter *et al.* (1953), as interpreted by ATSDR (1989a) and IRIS (1994), present exposure to 19 mg/kg-bw/day for 1 year as a LOAEL for guinea pigs with regard to increased liver weights.

Effects on the testes have been investigated in several studies. Agarwal *et el.* (1986) exposed mature male rats to DEHP for six months and found a NOAEL of 62.5 mg/kg-bw/day for testicular effects. A somewhat lower NOAEL was indicated for male mice by Reel *et al.* (1982) at 13 mg/kg-bw/day over a 105-day exposure period during the pre-mating and mating periods. The LOAEL for this study was 130 mg/kg-bw/day. Fifty mg/kg-bw/day provided to female mice during 7 days of gestation, resulted in effects to the embryo or fetus (RTECS 1994).

DEHP has also been implicated in developmental (teratogenic) effects. Single oral doses of DEHP given to pregnant mice resulted in decreased fetus weight (LOAEL) at 49 mg/kg-bw and major malformations at 91 mg/kg-bw/day (ATSDR 1989a). Forty-four mg/kg-bw/day was determined to be a NOAEL for any major malformations (ATSDR 1989a). In another investigation, 35 mg/kg-bw/day over 14 days of gestation resulted in effects to the ovaries and fallopian tubes of adult female rats (RTECS 1994).

The highest NOAEL listed above is 62.5 mg/kg-bw/day for reproductive effects. However, 35 mg/kg-bw/day given to pregnant rats resulted in a reproductive LOAEL and teratogenic effects may appear at 50 mg/kg. The LOAEL for liver histological and biochemical effects (19 mg/kg-bw/day) is below this concentration. The 35 mg/kg-bw/day reproductive LOAEL was chosen as the TBV for mammals. The LOAEL for liver effects is slightly below this value, but the consequences of liver effects are considered less critical than those found in the reproductive studies.

No studies were located regarding the effects of DEHP on birds, terrestrial vegetation, or soil macroinvertebrates.

Butylbenzylphthalate. Butylbenzylphthalate is also known as benzylbutylphthalate and is used with other phthalates in the production of plastics. The mechanism of action

appears to be similar to other phthalate esters such as bis(2-ethylhexyl)phthalate. The majority of effects appear to be hepatic, renal, and reproductive.

Acute oral LD_{50}s available for rats range from 2,330 mg/kg-bw for rats (RTECS 1994) to 13,500 mg/kg-bw (HSDB 1994). Other values included 4,170 mg/kg-bw for mice and 13,750 mg/kg-bw for the guinea pig (RTECS 1994). No lowest lethal dose information was available, but no evidence of mortality was seen in rats at doses of approximately 1,400 mg/kg-bw/day over a 14-day study period (HSDB 1994).

Doses to rats of approximately 1,400 mg/kg-bw/day over 26 weeks caused decreased weights of the heart, kidney, lungs, seminal vessicals, and testes (IRIS 1994). Doses of 375 mg/kg-bw/day over 14 days also resulted in increased rat liver weights and kidney effects (IRIS 1994). Reproductive effects were observed at 274 mg/kg-bw/day provided to pregnant female rats on days 1 through 7 of gestation (RTECS 1994). No observed adverse effects (NOAEL) were observed in rats provided 160 mg/kg-bw/day in a 26-week study and 250 mg/kg-bw/day over 90 days in another study (IRIS 1994). Since the 250 mg/kg-bw NOAEL was not tested on pregnant female rats and is nearly equal to the LOAEL of 274 mg/kg-bw/day, it is recommended that the chronic value of 160 mg/kg-bw/day be used as a NOAEL for butylbenzylphthalate and 274 mg/kg-bw/day be used as a chronic reproductive LOAEL.

No data were found regarding the toxicity of butylbenzylphthalate to vegetation, soil invertebrates, or birds.

Pesticides

Aldrin/Dieldrin. Aldrin is also known as aldrex or HHDN, and dieldrin is called dieldrix or HEOD. Aldrin and dieldrin are structurally similar and were produced as insecticides for corn, cotton, and other crops. Aldrin and dieldrin have not been used legally in the United States since 1987. These two compounds are discussed simultaneously in this section because aldrin is readily transformed into dieldrin in biological systems and in the environment.

Aldrin and dieldrin are highly lipophilic and, therefore, are absorbed rapidly by fish and wildlife via inhalation, dermal contact, or ingestion (ATSDR 1993n). Due to lipophilicity, fat is a primary storage area for these compounds. Once absorbed, aldrin is rapidly

converted to dieldrin by mixed-function oxidases, mainly in the liver (Lang et al. 1986). Dieldrin is further oxidized by epoxide hydratases, mono-oxygenases, and glucoronidation (ATSDR 1993n). As dieldrin is biotransformed and removed from tissues, it may be mobilized from fatty deposits, especially during periods of starvation when wildlife rely on fat stores for energy. Aldrin and dieldrin biotransformation products are eliminated via feces and urine.

Acute oral LD_{50}s for mammals range from 37 to 64 mg/kg-bw for aldrin and dieldrin, respectively (ATSDR 1993n). Lethality was also observed in dogs at doses as low as 0.89 mg/kg-bw/day aldrin and 1.95 mg/kg-bw/day dieldrin. Decreased survival was observed in rats dosed with 0.5 mg/kg-bw/day dieldrin over a two-year period (ATSDR 1993n).

Aldrin and dieldrin may also result in systemic effects including cardio-vascular, hepatic, renal, immunological and neurological systems. Chronic exposure of rats to 0.016 mg/kg-bw/day dieldrin may detrimentally affect arteries (Harr et al. 1970). However, 15 mg/kg-bw/day dieldrin over a six month period did not alter the histopathology of the heart. Noticeable hepatic responses may result at doses of 1.6 mg/kg-bw/day dieldrin in mice exposed for only one week, or doses of 0.1 mg/kg-bw/day in dogs, mice, and rats over a five-year period (ATSDR 1993n). In rats, adverse effects on the liver from exposure to aldrin or dieldrin were noticed at doses of 2 mg/kg-bw/day over a 6-month period (ATSDR 1993n). Nephrosis and glomerulonephrities in the proximal convolute tubules of the kidney occured in rats dosed with 15 mg/kg-bw/day dieldrin for 15 days. However, over a 2-year period, adverse renal effects were noticed at doses as low as 0.125 mg/kg-bw/day dieldrin (ATSDR 1993n). In mice, slight immunological effects were observed at a single dose of 0.065 mg/kg-bw/day dieldrin over a 2 week period. In addition, a decrease in resistance to malaria infections was produced at 0.13 mg/kg-bw/day over a 10 week period (ATSDR 1993n). Neurological effects of aldrin and dieldrin, such as convulsions, were observed in rats given 10 mg/kg-bw/day dieldrin for 3 days, while less serious nervous system responses such as disrupted operant behavior occured at doses of 0.25 mg/kg-bw/day dieldrin for 120 days. No observed adverse effects (NOAEL) were seen at a dose of 0.05 mg/kg-bw/day over a 2-year period (ATSDR 1993n).

Developmental and reproductive effects also may result from exposure to aldrin and dieldrin. Increases in cleft palate and webbed feet were observed mice offspring after expsoure to 15 mg/kg-bw/day dieldrin on day 9 of gestation. No physical abnormalities were observed at a dosage of 6 mg/kg-bw/day dieldrin. However, decreased pup survival has been noted at doses as low as 0.125 mg/kg-bw/day dieldrin (LOAEL) when provided to adult rats for 118 days prior to conception (ATSDR 1993n). Similarly, reproductive effects in rats, exposed to dieldrin from 28 days old to their first mating (ATSDR 1993n), were observed at doses as low as 0.125 mg/kg-b/day dieldrin.

LOAEL and NOAEL values of 0.125 and 0.05 mg/kg-bw/day were chosen for aldrin/dieldrin, respectively. The LOAEL represents the lowest concentration for potential adverse effects, and the NOAEL value was the highest concentration reported that did not elicit adverse effects on species tested. The LOAEL and NOAEL doses presented above were used for both compounds because they posess similar physiochemical properties and because dieldrin is a breakdown product of aldrin.

An LD_{50} of 3 mg/kg-bw/day dieldrin was reported for the Japanese quail (*Coturnix*) (Hill and Camardese 1986). This value was used as the TBV in the ERA because it was the only value reported. No toxicity information was found for vegetation or soil macroinvertebrates.

Alpha, beta, delta, and gamma-BHC. Hexachlorocyclohexane is also known as HCH, benzene hexachloride, and BHC. There are several isomers of HCH including alpha, beta, delta, and gamma. Each of these is produced as part of technical grade HCH, which was once used as an insecticide in the United States. HCH has not been produced in the United States since 1983.

The HCH isomers are rapidly absorbed in the gastro-intestinal tract (Ahdya *et al.* 1981; Turner and Shanks 1980). The primary breakdown occurs in the liver through the cytochrome P-450 oxidative system (Liu and Morgan 1986) and the products include chlorophenols, chlorocyclohexanes, chlorocyclohexanols and glucuronide metabolites (ATSDR 1993o; Chadwick and Freal 1972; Engst *et al.* 1976). The major pathway of excretion is through the urine (Chadwick *et al.* 1985).

The main mechanism of toxicity of HCH is thought to be the interference with gamma-aminobutyric acid (GABA) within the nervous system (Abalis *et al.* 1985, Fishman and Gianutsos 1988). Enhanced synaptic activity, and inhibition of ATPases (Joy and Albertson 1985, Uchida *et al.* 1974) are also potential effects of HCH. Anti-estrogenic activity may also be related to HCH (Chadwick *et al.* 1988).

Acute oral LD_{50}s for male and female rats exposed to gamma-HCH are approximately 90 mg/kg-bw (Gaines 1960). Another LD_{50} value of 1,000 mg/kg-bw is listed in RTECS (1994) for delta-HCH. No LD_{LO} values were found for HCH.

The blood of beagle dogs was not affected when exposed to 12.5 mg/kg-bw/day gamma-HCH for two years (Rivet *et al.* 1978), but some slight effects were noticed at the same exposure level of beta-HCH over a 13-week period (Van Velsen *et al.* 1986).

Exposure of rats to 5 mg/kg-bw/day gamma-HCH for 70 weeks resulted in liver necrosis and fatty degeneration (Fitzhugh *et al.* 1950). This represented the lowest LOAEL for gamma-BHC and was chosen as the TBV for the Phase II ERA. Rats and mice exposed to approximately 6 mg/kg-bw/day of gamma-HCH for three days and 12 weeks, respectively, expressed increased liver enzyme activities and increased liver weight (ATSDR 1993o). Alpha-HCH given to rats at 2.5 mg/kg-bw/day for 56 weeks, beta-HCH at 0.5 mg/kg-bw/day for 53 weeks, and technical grade HCH at 2.5 mg/kg-bw/day over 61 weeks also resulted in fatty degeneration and necrosis (Fitzhugh *et al.* 1950). A NOAEL of 0.1 mg/kg-bw/day for hepatic effects was presented by Van Velsen *et al.* (1986), but in chronic (360 day) studies with mice, a NOAEL of 2 mg/kg-bw/day was presented by Dikshith *et al.* 1991. This represents the highest NOAEL for alpha-, beta-, delta-, and gamma-BHC and was chosen as the TBV for the Phase II ERA.

Renal affects were noted in ATSDR (1993o) and Van Velsen *et al.* (1986) when rats were exposed to gamma- and beta-HCH at 2.5 mg/kg-bw/day for 40 days and 13 weeks, respectively. No renal affects were seen in rats given 5 mg/kg-bw/day alpha-HCH for nearly 36 weeks.

Seizures were noted in rats after a single administration of 30 mg/kg-bw gamma-HCH, but not at 20 mg/kg-bw (ATSDR 1993o). Exposure to 10 mg/kg-bw as a single dose did not result in seizures, but did increase spontaneous motor behavior (ATSDR 1993o). In

longer duration studies, similar concentrations of alpha- and beta-HCH resulted in similar neurological effects (ATSDR 1993o).

Doses to rats of approximately 10 mg/kg-bw/day beta-BHC appear to produce reproductive and teratogenic effects (ATSDR 1993o). Concentrations of beta- and gamma-HCH as low as 0.5 mg/kg-bw/day may result in effects to ovaries or testes, but these effects do not appear to affect overall reproduction rates (ATSDR 1993o). It appears that beta-HCH is more toxic than gamma-HCH with regard to reproductive and teratogenic effects. Therefore, 10 mg/kg-bw/day LOAEL was chosen as the TBV for beta-BHC in the Phase II ERA.

A subacute (5 day) LD_{50} for 14-day old japanese quail exposure to gamma-HCH was approximately 68 mg/kg-bw/day (Hill and Camardese 1986). Three to four month old mallards had an acute oral LD_{50} of greater than 2,000 mg/kg-bw (Hudson *et al.* 1984), but the 30-day empirical minimum lethal dose was 30 mg/kg-bw/day.

No toxicity data were located for vegetation or soil macroinvertebrates.

Heptachlor. Acute oral LD_{50}s for heptachlor range from 40 mg/kg-bw for rodents (guinea pigs, hamsters, mice, and rats) to 162 mg/kg-bw for rabbits (ATSDR 1993k). A rat acute oral LD_{50} of 100 mg/kg-bw was listed in EPA (1985l). At 6.19 mg/kg-bw, heptachlor was lethal to three of eight mink over a 28-day period (Aulerich *et al.* 1990) and 2.3 mg/kg-bw was a LOAEL for mortality (18% decrease in survival) in female mice over an 80-week timeframe (ATSDR 1993k). Another LOAEL for developmental and reproductive effects was determined by Green as cited in ATSDR (1993k). Within this study, 0.25 mg/kg-bw was found to result in increased resorption of fetuses, decreased fertility, and an increased number of abnormal embryos. This dose was used as the TBV in the assessment of risks to small mammals.

The only avian toxicity value located was approximately 2,000 mg/kg-bw for the mallard (Hudson *et al.* 1984). This dose was used as the TBV for birds. No toxicity data were located regarding the effects of heptachlor on vegetation or terrestrial invertebrates.

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Heptachlor Epoxide. The acute oral LD_{50} in mammals for heptachlor epoxide ranges from 39 to 144 mg/kg-bw. Podowski *et al.* (1979) present an LD_{50} for rats of 60 mg/kg-bw. The only other toxicity datum located for heptachlor epoxide was a 5-day study with mice (ATSDR 1993k). A NOAEL of 8 mg/kg-bw was determined in this study. No toxicity data were located for the effects of heptachlor epoxide on vegetation, soil macroinvertebrates, and birds.

Methoxychlor. The acute oral LD_{50} values for methoxychlor range from 2,900 mg/kg-bw for mice to 7,000 mg/kg-bw for female rats; however, doses of 500 mg/kg-bw over several weeks resulted in some deaths of rats (ATSDR 1992k). Systemic effects do no seem to be a major concern for exposure to methoxychlor, although the liver may be affected by high doses. Some aspects of the reproductive system in female rats may be affected at doses as low as 25 mg/kg-bw but reproductive function was not affected (LOAEL) until the dose was 50 mg/kg-bw (ATSDR 1992k). For developmental effects, 30 mg/kg-bw was determined to be a NOAEL (Gellert and Wilson 1979).

Young (14-day old) Japanese quail exposed to 5,000 mg/kg in their diet (approximately 1,000 mg/kg-bw) did not exhibit any noticeable overt toxic effects (Hill and Camardese 1986). No toxicity data were located for soil invertebrates or vegetation.

Polychlorinated Biphenyls

Aroclors 1254 and 1260. Aroclors are commercial mixtures of PCBs, including 209 compounds with varying toxicities. A subset of these are significant for environmental exposure, including Aroclor 1254 and Aroclor 1260. Causes of death in acute poisoning included progressive dehydration and central nervous depression; liver and kidney damage was also noted (WHO 1986). Acute oral LD_{50}s for Aroclor 1254 vary from 1,010 mg/kg-bw in rats to 4,000 mg/kg-bw in mink (Aulerich and Ringer 1977; Garthoff *et al.* 1981). For Aroclor 1260, a rat acute oral LD_{50} was measured at 1,315 mg/kg-bw (Linder *et al.* 1974). Chronic and subchronic exposure to PCBs can cause a variety of systemic effects, with hepatic and renal systems generally the most sensitive. Hornshaw *et al.* (1986) reported a 28-day LD_{50} for Aroclor 1254 in mink of 7 mg/kg-bw. Cardiac, hepatic, and renal damage

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were seen in this investigation. The NOAEL in this study was 1.25 mg/kg-bw. Reproductive effects were not seen (NOAEL) at 0.1 mg/kg-bw in mink for Aroclor 1254 (Wren *et al.* 1987). Some rat NOAELs for Aroclor 1254 ranged from 0.025 mg/kg-bw to 5 mg/kg-bw for hepatotoxicity and systemic toxicity, respectively. The highest NOAEL of 5 mg/kg-bw was chosen as the TBV for Aroclor 1254. For Aroclor-1260, the guinea pig NOAEL was 2.0 mg/kg/day over 8 weeks (Vos and de Roij 1972). Two rat NOAELs for systemic and development effects were 5 and 6.9 mg/kg-bw, respectively. The highest of these was selected as the TBV for this assessment.

Odema of the abdominal and peritoneal cavities has been noted in bird mortality, as well as enlargement of the liver and kidneys (WHO 1976). The acute oral LD_{50} for Aroclor 1254 in mallards was greater than 2,000 mg/kg-bw (WHO 1976) but an LD_{50} for finches was 254 mg/kg-bw. Aroclor 1260 had an LD_{50} of 87.7 in bobwhites (HSDB 1994), and this value was selected as the Aroclor 1260 avian TBV for the assessment because the endpoint of mortality was more significant than the growth endpoint for chicken NOAEL of 100 mg/kg-bw (WHO 1976). An Aroclor 1254 LOAEL for growth of chickens exposed subchronically was 100 mg/kg-bw (WHO 1976). Exposure of mallards to 40 ppm (approximately 4 mg/kg-bw) Aroclor 1254 in feed did not have significant impact on reproduction (Risebrough and Anderson 1975).

Soybeans experienced a 10% reduction in growth when exposed to 0.01 mg/kg Aroclor 1254 and Aroclor 1260 in soil. No toxicity data were found for soil invertebrates.

Dioxins/Furans

Dioxins (2,3,7,8-Tetrachlorodibenzo-p-dioxin). Laboratory studies with birds and mammals have demonstrated that dioxins are highly toxic and both acute and chronic exposure to 2,3,7,8-TCDD can result in teratogenic, mutagenic, histopathologic, immunotoxic, and reproductive effects as well as mortality. Typically, animals poisoned by 2,3,7,8-TCDD exhibit weight loss, atrophy of the thymus gland, and eventually death. The guinea pig and mink are quite sensitive to dioxins with acute oral LD_{50}s of approximately 0.0006 mg/kg-bw and 0.0042 mg/kg-bw, respectively (EPA 1990, ATSDR 1989c). Subchronic exposure (90 days) of guinea pigs to 0.00000061 mg/kg-bw did not result in any deaths, but no other

effects were monitored. Rat and Rhesus monkey bioassays indicated threshold effect levels (LOAELs) for reproduction of 0.000001 and 0.0000015 mg/kg-bw, respectively (ATSDR 1989c). A NOAEL for rats was suggested to be less than 0.000001 mg/kg-bw in another study (ATSDR 1989c) . The results of these studies indicate a range of sensitivity for different species. A NOAEL TBV of 0.00000061 mg/kg-bw was selected based on the most sensitive species (guinea pig).

Based on currently available data for avian species, it appears that gallinaceous birds are the most sensitive to TCDD. Northern bobwhites and chickens are very sensitive to the effects of dioxins with a reported LD_{50}s of 0.015 and 0.025 mg/kg-bw, respectively (Eisler 1986a). It appears that effects on reproduction are of particular concern. In ring-necked pheasants, a female adult dose equivalent to 0.00014 mg/kg-bw resulted in 100% embryo mortality, while a dose of 0.000014 mg/kg-bw appeared to be a threshold level for no effect (NOAEL) (EPA 1990).

In terrestrial invertebrates, two species of earthworms showed no adverse effects when held in soils containing 5 mg/kg 2,3,7,8-TCDD, but both species died at 10 mg/kg soil (Eisler 1986a). No plant toxicity data were available.

U.3.3.2.3 Inorganics

Selenium. Selenium is a naturally occurring element in the earths crust. It is released into the air and onto soils during the burning of coal and as a by-product of copper refining. Selenium is used in plastics, paints, pharmaceuticals, and as a nutritional supplement. The most common forms of selenium in the environment are sodium selenite and sodium selenate. These are also the most toxic forms of selenium to animals (ATSDR 1994b).

Selenium may be widely distributed throughout the body, but appears to concentrate in the liver and kidney (ATSDR 1994b). It may also be transferred across the placenta to the fetus (Willhite 1990). The mechanism of action of selenium is unknown, but it is postulated that there is an interaction between selenium and sulfhydryl enzymes that may affect the cellular oxidative process. The effects of selenium may be to organ systems such as the liver

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and kidney, but it may also affect reproduction and the development of unborn young (ATSDR 1994b).

Acute oral LD_{50}s for sodium selenite range from 1 mg/kg-bw in rabbits to 7 mg/kg-bw in rats (ATSDR 1994b). Mouse and guinea pig LD_{50}s are between these values. Some 10-day oral LD_{LO}s were 13 mg/kg-bw for pigs and 9.9 mg/kg-bw/day for cows (Miller and Williams 1940). Other acute LD_{LO}s for small mammals include 0.44 mg/kg-bw/day for male rats (Halverson *et al.* 1966).

There was a 50 % lethality rate for rats provided 0.28 mg/kg-bw/day of sodium selenite in drinking water over 58 days (Schroeder and Mitchener 1971). This indicates that the chronic toxicity of selenium is important because this lethal dose is below the acute oral LD_{50} indicated above. However, most of the systemic effects of selenium occur at doses that are likely to be lethal to individuals of the tested population. Acute toxic hepatitis and cirrhosis are reported to occur at doses of 0.25 mg/kg-bw/day (ATSDR 1994b, Nelson *et al.* 1943) and some liver degeneration was seen at 0.10 mg/kg-bw/day (ATSDR 1994b).

Immunological effects due to exposure to selenium compounds were noted in ATSDR (1994b). In the study, exposure of rats to 0.75 mg/kg-bw/day in drinking water over 10 weeks resulted in reduced humoral antibody production. At the lower doses of 0.075 and 0.28 mg/kg-bw/day, the natural killer cell cytotoxicity was increased, enhancing the immune response.

In small mammals, reproductive and developmental effects are also possible, but occur at doses which may be systemically toxic or lethal to the adults. A dose of 0.34 mg/kg-bw in the drinking water of female mice over 30 days and during pregnancy did not affect fertility, but did significantly reduce fetal growth (ATSDR 1994b). A NOAEL for developmental effects was found at 0.14 mg/kg-bw/day during the study.

The systemic effects induced by exposure to selenium appear to be the most sensitive indicators. Therefore, it is proposed that the acute LOAEL of 0.1 mg/kg-bw/day for hepatic effects be used as the TBV in the Phase II ERA.

U.3.4 RISK CHARACTERIZATION

In this section, potential ecological risks from exposure to RRII undeveloped landfill surface soil SOPCs are identified and summarized. Results of the Phase I ERA are used in the Phase II ERA for a weight-of-evidence approach and are briefly discussed in this section. Risk characterization involves two major steps, risk estimation and risk description (EPA 1992a), as described below.

U.3.4.1 Risk Estimation

As in the Phase I ERA, the HQ method was used to assess potential ecological risks to measurement species and communities from exposure to undeveloped landfill surface soil SOPCs. A description of the HQ method is presented in Section U.2.4.1 of the Phase I ERA.

U.3.4.1.1 Potential Risks to Terrestrial Measurement Communities

Tables V-21 and V-22 present comparisons of RRII surface soil SOPC concentrations to literature-derived RBSCs for vegetation and soil invertebrates, respectively. Section U.2.4.1.1 presents the methodology for the comparison of undeveloped landfill surface soil concentrations to literature-derived RBSCs for vegetation and soil macroinvertebrtaes. The following subsections present a discussion of potential risks to terrestrial measurement communities from exposure to surface soil SOPCs detected during the RRII.

Potential Risks to Terrestrial Vegetation

Currently, there is no EPA guidance for quantitatively evaluating potential adverse effects to vegetation growing in contaminated soil. Although phytotoxicity data are available for some SOPCs, many of the studies conducted involved aerial application of chemicals on crop species. Only studies which correlated toxic effects to SOPC concentrations in soil were used. Potential phytotoxicity was evaluated by comparing undeveloped landfill SOPC concentrations with toxicity values from the literature. Phytotoxic effects reported include: chlorosis, reduction in weight, height, growth depression, and yield.

Of the potential soil SOPCs for which phytotoxicity data were available, only inorganic SOPC concentrations exceeded literature-derived RBSCs, namely arsenic, beryllium,

cadmium, copper, iron, lead, mercury, nickel, and zinc. Mercury exceeded its RBSC by three orders of magnitude in 38% of the samples collected during the RRII. Lead, iron, and copper exceeded RBSCs by two orders of magnitude in 52%, 44%, 13% of the samples, respectively. Arsenic, zinc, cadmium, nickel, and beryllium exceeded RBSCs by one order of magnitude in 83%, 62%, 37%, 23%, and 2% of the samples, respectively.

Potential Risks to Terrestrial Soil Macroinvertebrates

Currently, there is no EPA guidance for quantitatively evaluating potential adverse effects to soil biota. Potential adverse effects were evaluated by comparing undeveloped landfill SOPC concentrations to toxicity values from the literature. Toxic effects reported include the following: mortality and total count of bacteria and fungi.

Of the potential soil SOPCs for which soil invertebrate toxicity information was available, copper, lead, mercury, and zinc were the only SOPCs which exceeded literature-derived RBSCs. Zinc exceeded its respective RBSC by two orders of magnitude in 62% of the surface soil samples collected during the RRII. Lead, nickel, and copper exceeded RBSCs by one order of magnitude in 52%, 23%, and 13% of the samples, respectively.

U.3.4.1.2 Potential Risks to Terrestrial Measurement Species

Potential ecological risks to measurement species (shrew, robin, and kestrel) were estimated by comparing species-specific modeled exposure doses to appropriate TRVs. The total HQ (e.g., the sum of HQs across all potential pathways for a selected measurement species and SOPC), based on the NOAEL TRV for each SOPC, was used as a conservative benchmark for the evaluation of potential adverse effects to measurement species. A total NOAEL HQ greater than 1 (unity) would be considered evidence for potential adverse, chronic effects of an SOPC on a given ecological receptor, for a given case, and a given critical effect.

Estimated exposure doses were derived in the exposure assessment (see Section U.3.3.1) and were based on the mean and 95% UCL concentrations of undeveloped landfill SOPCs. TRVs were derived in the ecological effects assessment (see Section U.3.3.2).

Potential Risks to the Shrew

Potential risks to the shrew from exposure to undeveloped landfill surface soil was estimated by comparing estimated daily doses of undeveloped landfill SOPCs to TRVs derived for the shrew. Table V-51 presents calculated HQs for the shrew. The ingestion of contaminated earthworms and surface soil resulted in average and RME HQs that exceeded one for several inorganic SOPCs and 2,3,7,8-TCDD.

For the shrew, the ingestion of earthworms represented the route of greatest potential exposure. Five surface soil SOPCs (aluminum, cadmium, copper, iron, and selenium) exceeded unity for both the soil and earthworm ingestion pathways, while six additional SOPCs (cobalt, lead, manganese, vanadium, zinc, and 2,3,7,8-TCDD) exceeded unity for only the earthworm ingestion pathway. Arsenic, nickel, and silver did not exceed one for either pathway individually, but the addition of the two pathways together resulted in the exceedance of one by each SOPC.

The total HQ for iron in both the average (HQ = 1,090) and RME (HQ = 2,770) cases was three orders of magnitude greater than unity. However, iron is often considered an essential nutrient in the evaluation of potential risks to wildlife. These HQs, however, suggest that iron occurs at concentrations that may be potentially toxic to the shrew. Copper (HQ = 244) and cadmium (HQ = 216) were the next most potentially toxic surface soil SOPCs, exceeding unity by two orders of magnitude. Aluminum (HQ = 67.1), zinc (HQ = 20.7), and selenium (HQ = 10.8) exceeded unity by one order of magnitude, whereas arsenic, cobalt, cyanide, lead, manganese, nickel, silver, vanadium, and 2,3,7,8-TCDD exceeded unity by less than one order of magnitude. Therefore, based on the total HQ, those SOPCs that exceeded one by the greatest magnitude are: iron, copper, cadmium, aluminum, zinc, selenium, cyanide, lead, manganese, nickel, silver, vanadium, and 2,3,7,8-TCDD.

Potential Risks to the Robin

Potential risks to the robin from exposure to undeveloped landfill surface soil was estimated by comparing the estimated daily doses of undeveloped landfill SOPCs to TRVs derived for the robin. Table V-52 presents calculated HQs for the robin. Ingestion of contaminated earthworms, fruit, and soil resulted in average and RME HQs that exceeded one

for several inorganic surface soil SOPCs and 2,3,7,8-TCDD. Of the three pathways evaluated for the robin, the ingestion of earthworms, represented the route of greatest potential exposure. Three surface soil SOPCs (aluminum, barium, and iron) exceeded unity for both the soil and earthworm ingestion pathways, while five additional SOPCs (cadmium, lead, mercury, zinc, and 2,3,7,8-TCDD) exceeded unity for only the earthworm ingestion pathway. Cyanide did not exceed one for either pathway individually, but the addition of the two pathways together resulted in the exceedance of one. The fruit ingestion pathway did not present risk from any SOPC evaluated.

The total HQ for aluminum exceeded one by two orders of magnitude. Iron exceeded unity by one order of magnitude, and barium, cadmium, cyanide, lead, mercury, and zinc, all exceeded unity by less than one order of magnitude. Therefore, based on the total HQ, those SOPCs which exceeded one by the greatest magnitude are aluminum, iron, barium, cadmium, cyanide, lead, mercury, and zinc.

Potential Risks to the Kestrel

Potential risks to the kestrel from exposure to undeveloped landfill surface soil was estimated by comparing the estimated daily doses of SOPCs to TRVs derived for the kestrel. Table V-53 presents calculated HQs for the kestrel. Ingestion of contaminated prey (shrew, robin, and insect tissue) resulted in average and RME HQs of greater than one for several inorganic surface soil SOPCs and 2,3,7,8-TCDD. Of the three pathways evaluated for the kestrel, the ingestion of shrew and robin tissue equally represented the routes of greatest potential exposure. Four surface soil SOPCs (aluminum, barium, iron, and mercury) exceeded unity for both the shrew and robin ingestion pathways, while 2,3,7,8-TCDD exceeded unity for only the shrew ingestion pathway. The insect ingestion pathway did not present risk from any SOPC evaluated.

The total HQs for aluminum and iron exceeded one by one order of magnitude, and barium and mercury exceeded unity by less than one order of magnitude. Therefore, based on the total HQ, those SOPCs which exceeded one by the greatest magnitude are aluminum, iron, barium, and mercury.

U.3.4.1.3 Estimation of Risk-Based Soil Concentrations

The estimation of RBSCs for the Phase II ERA was performed using the methods provided in the Phase I ERA (Section U.2.4.1.3). Table V-54 provides a list of RBSCs for surface soil SOPCs evaluated in the Phase II ERA.

U.3.4.2 Risk Description

This section summarizes potential risks and uncertainties associated with the ERA. In addition, the ecological significance of the potential risks is discussed given the uncertainties associated with the methods used in the Phase II ERA.

U.3.4.2.1 Summary of Risks

The hypothesis presented in the focused ecological exposure model (Section U.3.2.10) was confirmed during the Phase II ERA:

- There is a potential for adverse ecological risks to terrestrial wildlife from exposure to SOPCs found in the surface soils of the undeveloped landfill.

Potential adverse effects to vegetation and soil macroinvertebrate communities on the undeveloped landfill from exposure to inorganic surface soil SOPCs are predicted based on comparisons to literature-derived RBSCs. Adverse ecological effects to undeveloped landfill measurement communities from exposure to organic surface soil SOPCs are not expected because concentrations of organic SOPCs detected in undeveloped landfill surface soil were below plant and soil macroinvertebrate RBSCs. Potential ecological effects to measurement communities (vegetation and soil invertebrate) are representative of risks to significant ecosystem components on the undeveloped landfill. Because these communities occupy the base of the terrestrial food chain, adverse effects to these communities may have adverse effects on wildlife at higher trophic levels.

Several inorganic SOPCs and 2,3,7,8-TCDD represented the source of potential ecological risks to the shrew, robin, and kestrel. Potential risks to these three measurement

species are representative of risks to the larger assessment endpoint groups of small mammals, passerines (perching and song birds), and raptors, respectively. Small mammals and passerines are important components of the terrestrial food chain because they play a role in the potential transfer of contaminants to higher trophic levels. Therefore, potential risks to these assessment endpoint groups may also indicate the potential for risks to higher trophic levels. Potential risk to the raptor assessment endpoint group may indicate that surface soil SOPCs on the undeveloped landfill have the potential to affect top food chain species.

The general conclusions of the Phase I ERA support the results of the Phase II ERA. Inorganic SOPCs in undeveloped landfill surface soil present the greatest potential for ecological risks to selected measurement species and communities on the undeveloped landfill.

U.3.4.2.2 Summary of Uncertainties

Many of the uncertainties associated with the Phase II ERA are similar to those presented for the Phase I ERA. The only difference between uncertainties in this phase and the Phase I ERA uncertainties is associated with stressor identification and screening, and derivation of EPCs. In Phase II, local background and upgradient samples were available for the screening of potential SOPCs, and the data set allowed calculations of both mean and 95% UCL EPCs. Therefore, the Phase II uncertainty analysis will present only those uncertainties associated with stressor screening and the calculation of EPCs. The uncertainties include following:

- For the undeveloped landfill, only two local background surface soil samples were found that closely resembled conditions on the undeveloped landfill. The eight other background samples were collected from schools. This may either overestimate or underestimate potential risks to undeveloped landfill species.

- For Florida Avenue Canal and Peoples Avenue Canal, only two upgradient surface water/sediment samples, respectively, were available for comparison to samples collected adjacent to the site. These upgradient samples may not adequately represent "true" background concentrations for surface water and sediment SOPCs detected adjacent to the site in either canal.

- During the initial data quality review, it was observed that several potential SOPCs had high detection limits in selected samples. To determine if these high detection limits affected the determination of potential risks to measurement species and communities, the highest detection limit reported for each SOPC selected in Phase II was compared to RBSCs for measurement species and communities (Table V-55). Antimony, cadmium, mercury, nickel, and thallium each had at least one detection limit that was above a respective RBSC. The detection limit for antimony was slightly higher than the shrew RBSC. This difference is unlikely to affect the calculated risks to the shrew from exposure to antimony in undeveloped landfill surface soil. Detection limits for thallium and nickel were also slightly below RBSCs for vegetation and the robin, respectively. Detection limits for cadmium and mercury were approximately one order of magnitude greater than RBSCs for the shrew and the robin, respectively. The cadmium RBSC for the robin was below the detection limit for cadmium. Therefore, potential risks estimated for the robin from exposure to cadmium may be underestimated.

- In order to calculate mean and 95% UCL EPCs for dioxins, TEFs were applied to each dioxin congener in a given sample. If an individual congener was not detected, half of the instrument detection limit (IDL) was used as the value for that congener. In many cases, half of the IDL value was greater than detected values for the same congener. This resulted in non-detected values that were higher than detected values. Because of this, potential risks to the kestrel from expsoure to dioxin congeners in undeveloped landfill surface soil were most likely overestimated.

- One-hundred percent bioaccumulation was assumed for those SOPCs that lacked plant, earthworm, small mammal, and bird BAFs. Potential risks to measurement species are likely overestimated using these BAFs.

U.3.4.2.3 Ecological Significance

The ecological significance of potential risks to wildlife on the undeveloped landfill is relatively minor, based on the site's environmental setting and the absence of sensitive species and habitats. The raptor group represents the only assessment endpoint group that may be of concern from a regulatory or social standpoint.

Although potential risks to individual species within the small mammal and passerine assessment endpoint groups were predicted as a result of expsosure to SOPCs in undeveloped

landfill surface soil, population level effects within these two groups are not expected because of their abundance in the southeastern United States.

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APPENDIX U

BASELINE ERA ILLUSTRATIONS

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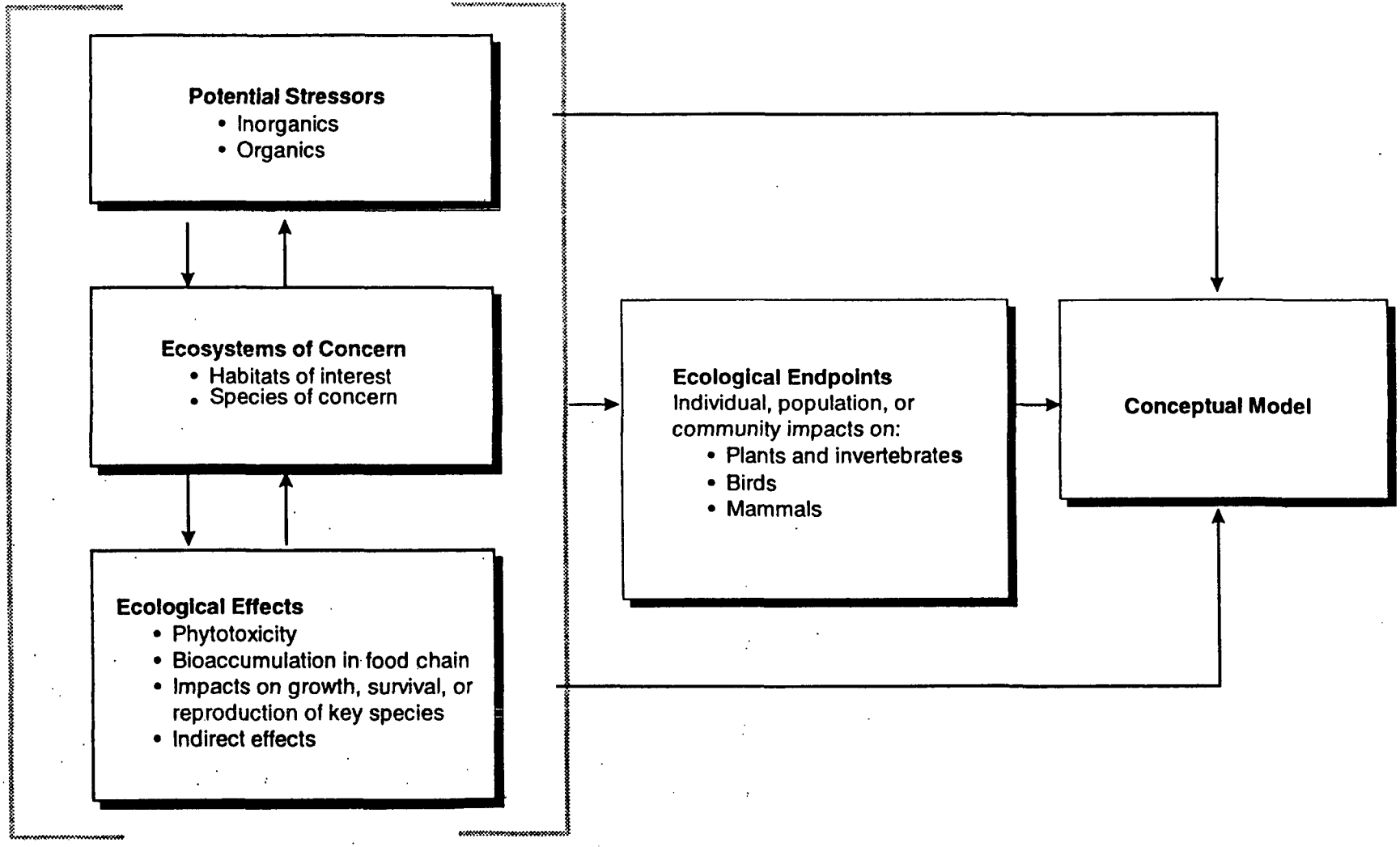

SOURCE: Ecology and Environment, Inc. 1993

Figure U-1 PROBLEM FORMULATION PHASE

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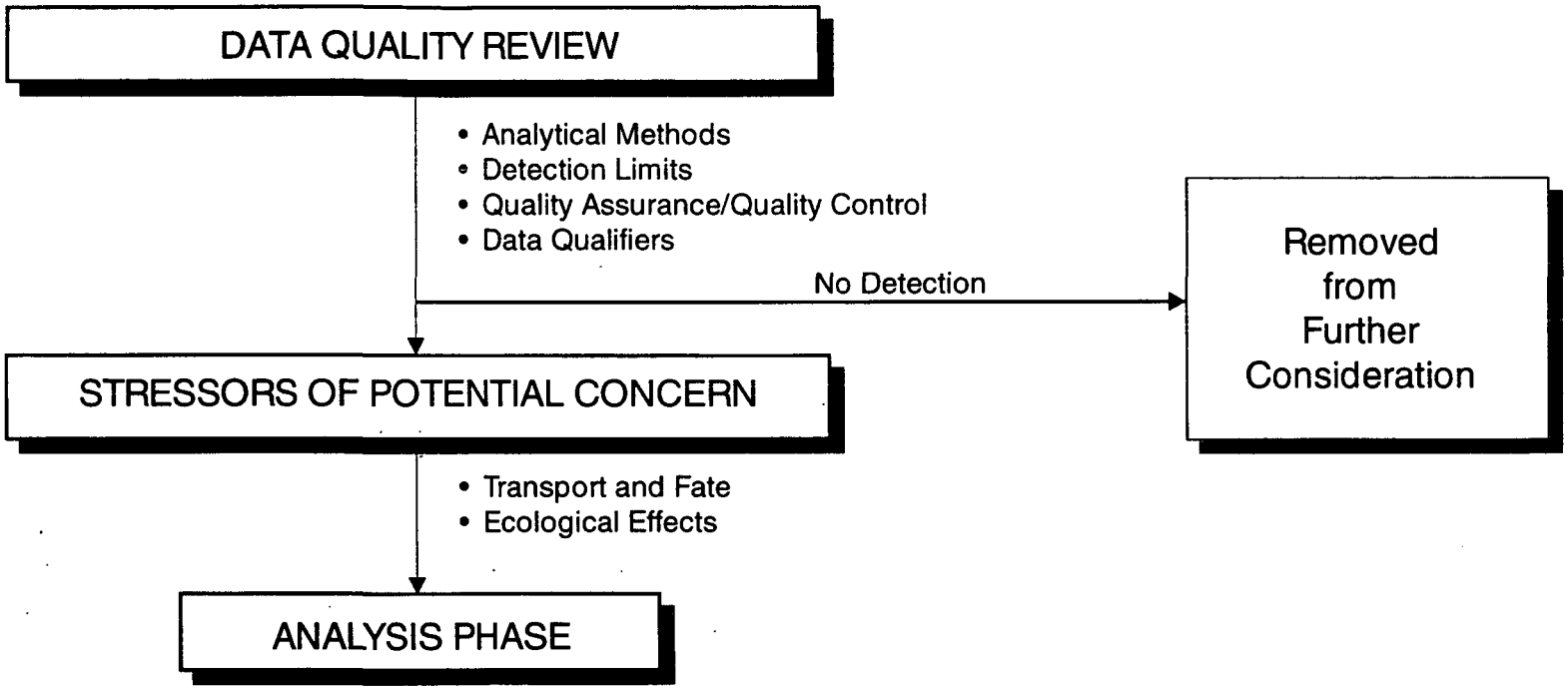

Figure U-3 SELECTION OF STRESSORS OF POTENTIAL CONCERN FOR THE PHASE I ECOLOGICAL RISK ASSESSMENT, AGRICULTURE STREET LANDFILL

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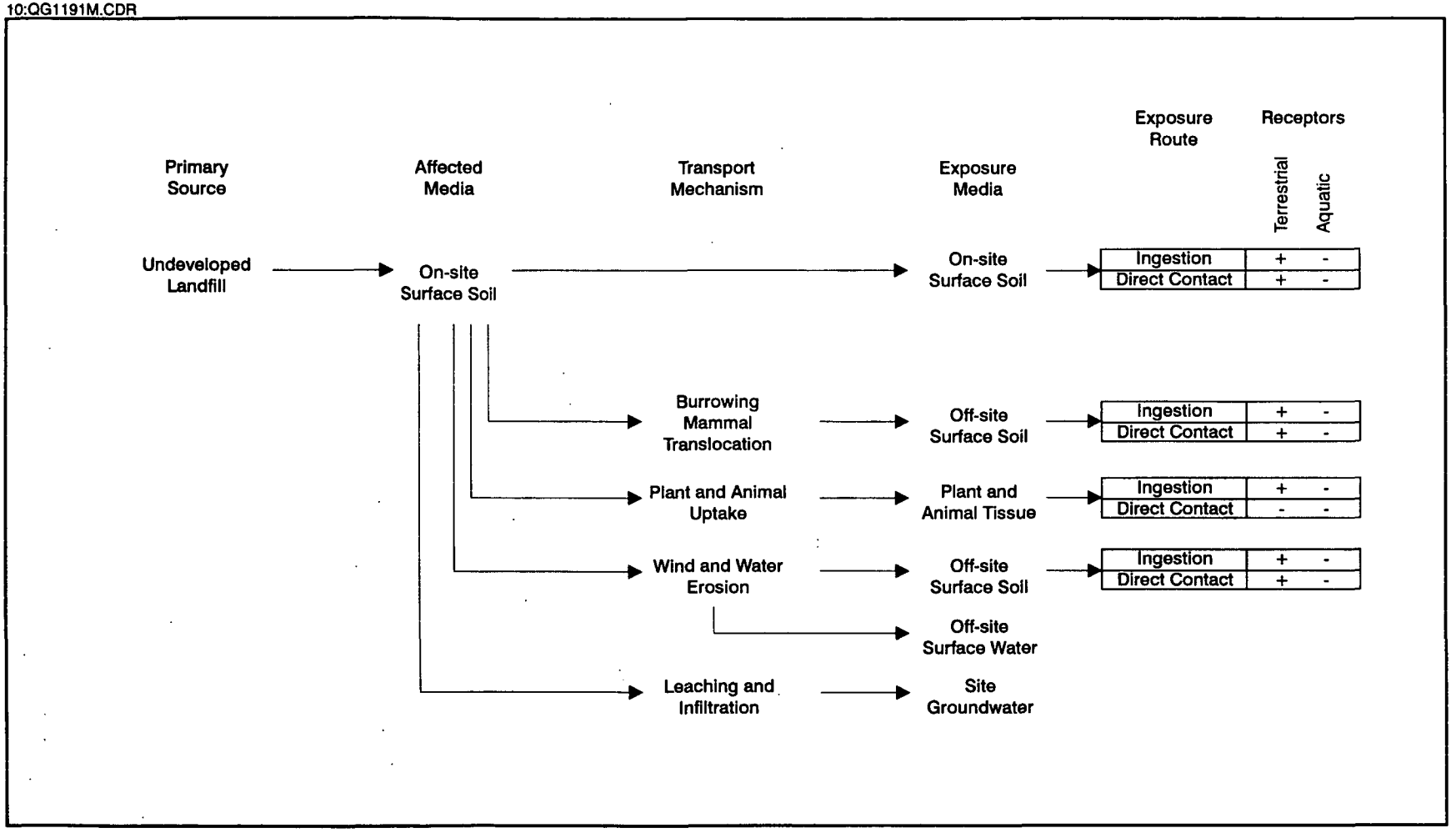

SOURCE: Ecology and Environment, Inc., 1994.

Figure U-4 POTENTIAL PATHWAYS OF CONTAMINANT MIGRATION AND RECEPTOR EXPOSURE ROUTES FOR THE UNDEVELOPED LANDFILL

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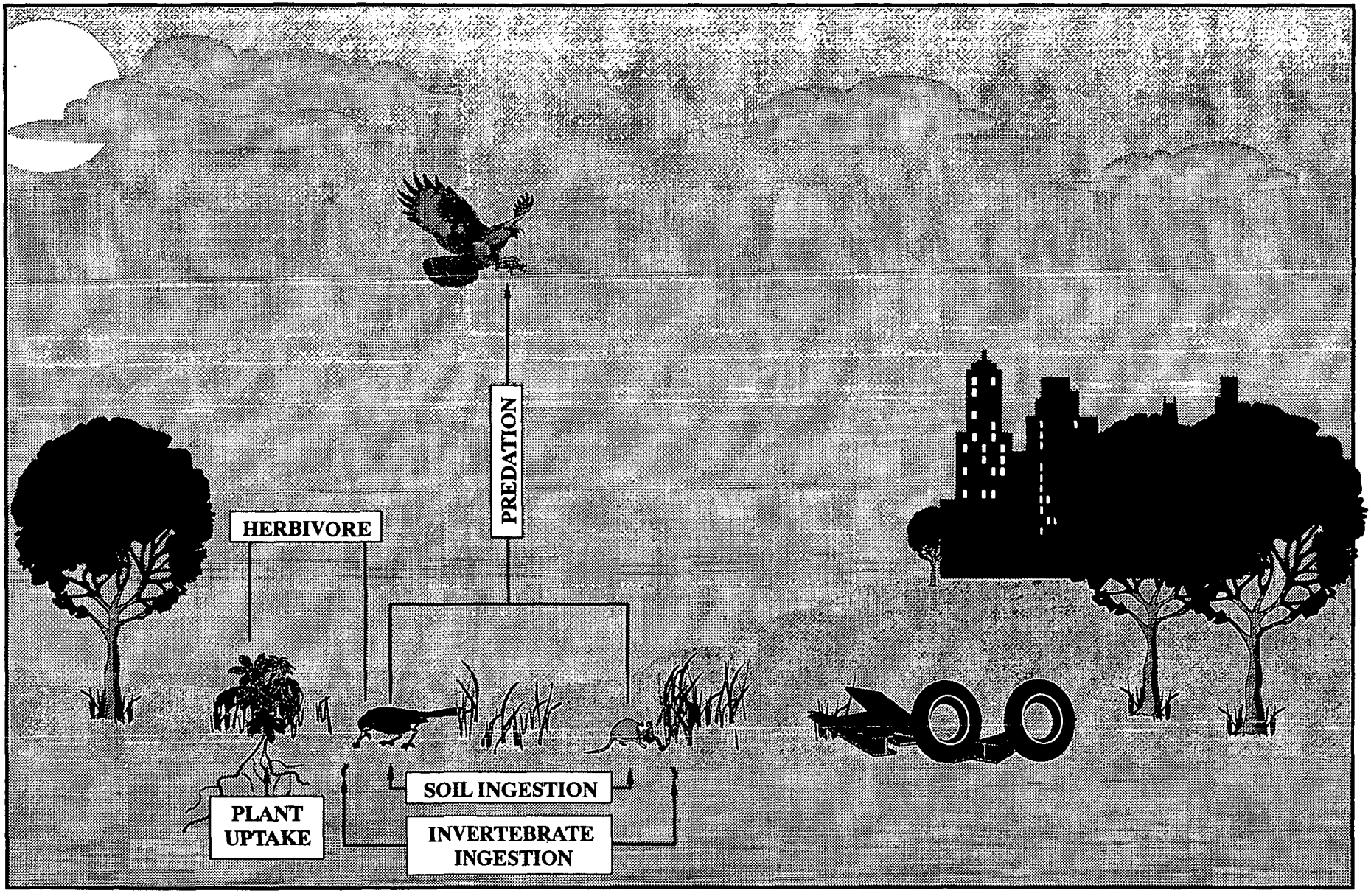

Figure U-5 REFINED ECOLOGICAL CONCEPTUAL SITE MODEL AGRICULTURE STREET LANDFILL

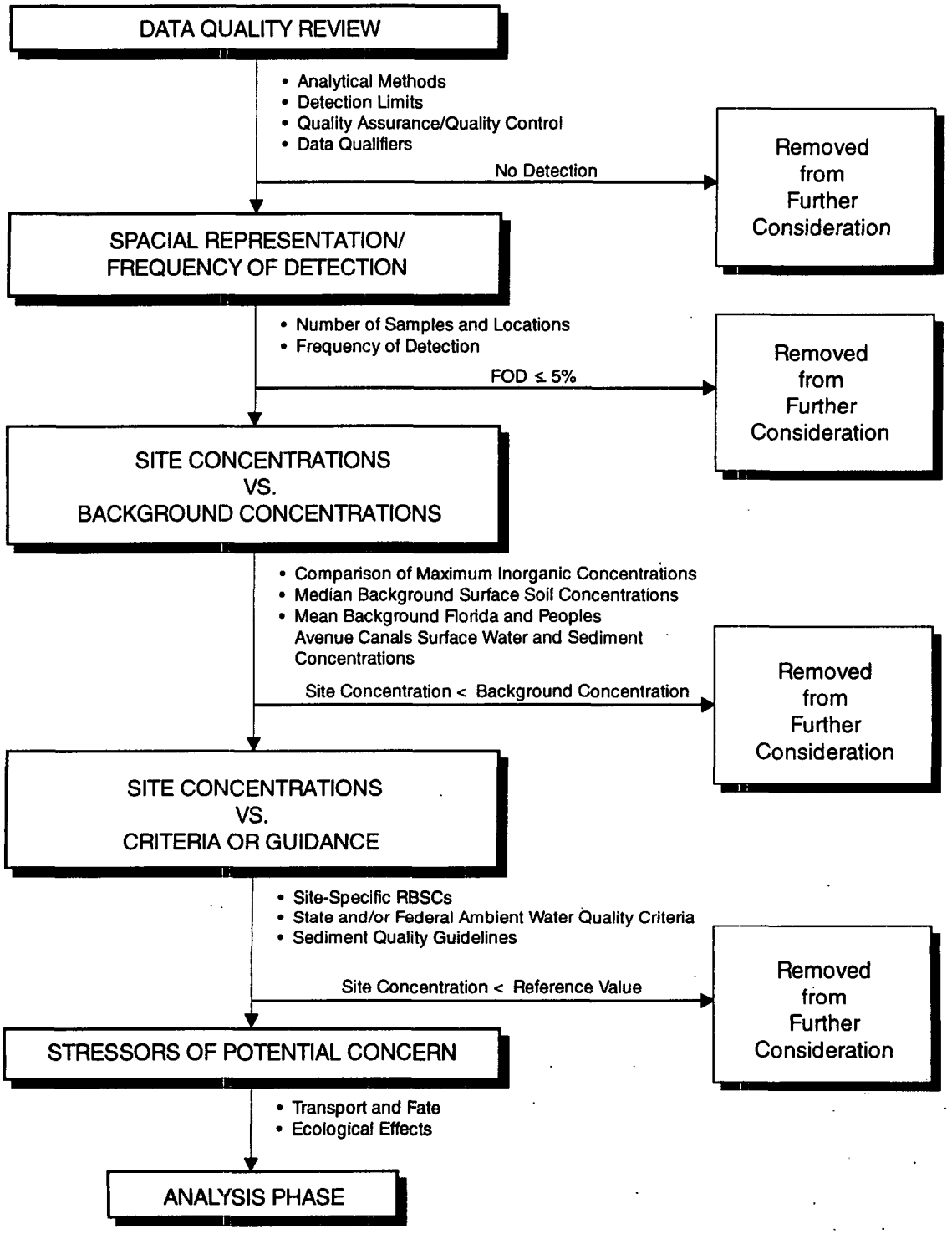

Figure U-6 SELECTION OF STRESSORS OF POTENTIAL CONCERN FOR THE PHASE II ECOLOGICAL RISK ASSESSMENT, AGRICULTURE STREET LANDFILL

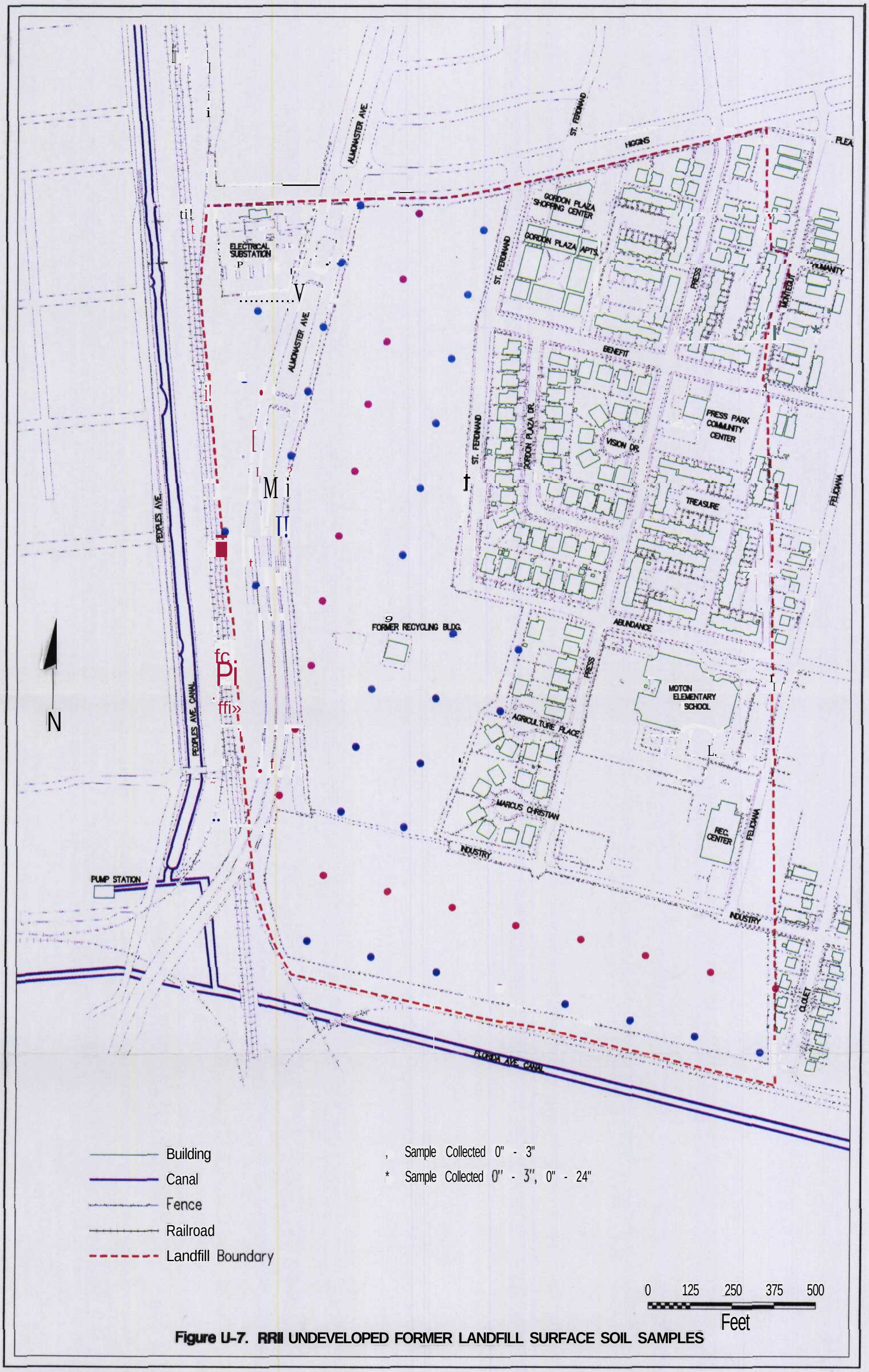

Figure U-7. RRII UNDEVELOPED FORMER LANDFILL SURFACE SOIL SAMPLES

Figure **U-8.** Storm **water Flow in Florida and Peoples Avenue Canals**

/dry3/agrstr/ecp-canal

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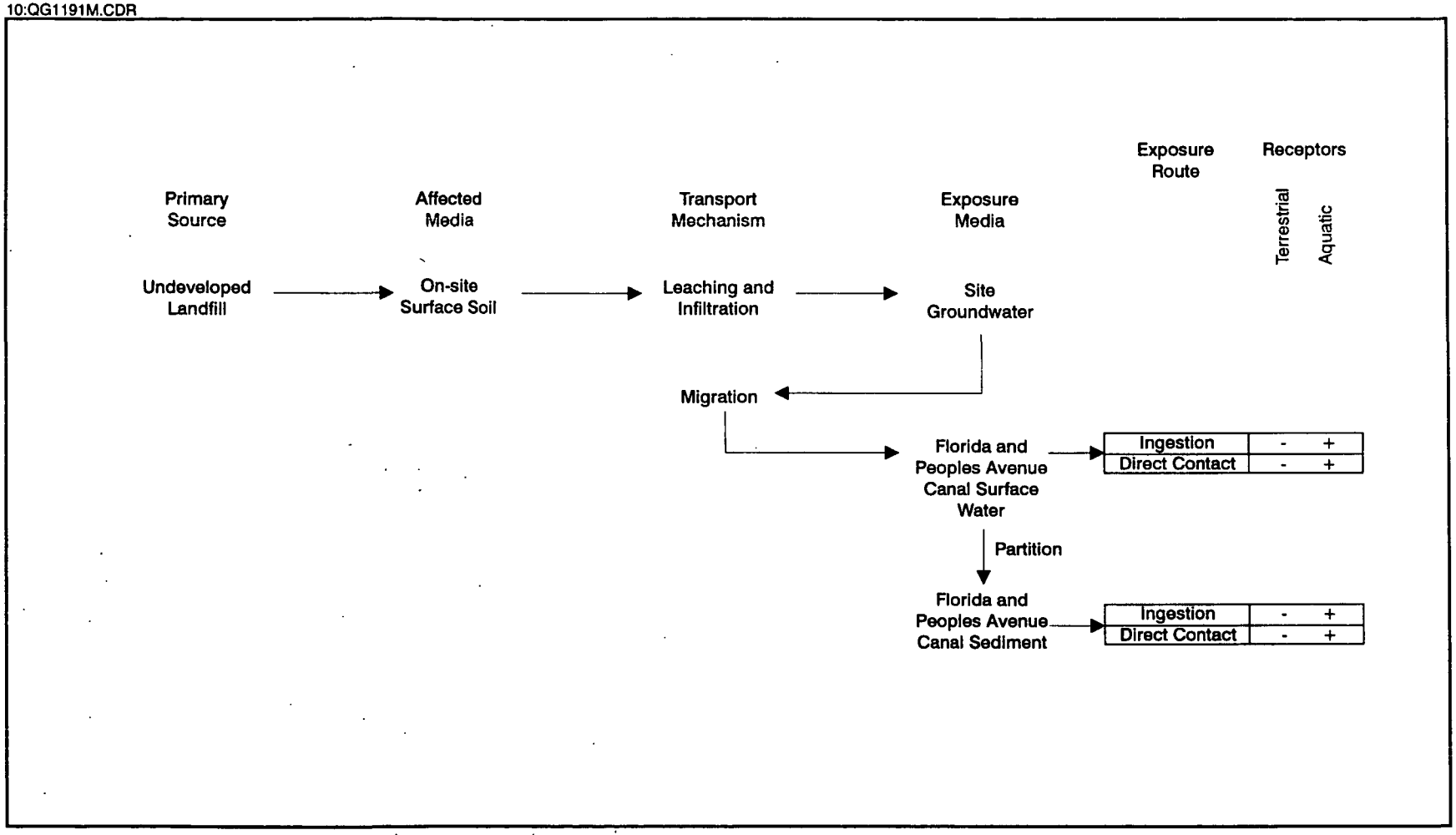

SOURCE: Ecology and Environment, Inc., 1994.

Figure U-9 POTENTIAL PATHWAYS OF CONTAMINANT MIGRATION AND RECEPTOR EXPOSURE ROUTES FOR THE FLORIDA AND PEOPLES AVENUE CANALS

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APPENDIX V

BASELINE ECOLOGICAL RISK ASSESSMENT DATA TABLES

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Table V - 1

SUMMARY OF ANALYTES DETECTED DURING THE EXPANDED SITE INVESTIGATION, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Analyte	Sample Number ESI03/SS-25 (mg/kg)	ESI04/SS-26 (mg/kg)	ESI05/SS-11 (mg/kg)	ESI15/SS-10 (mg/kg)
Volatile Organic Compounds				
Acetone	0.012 U	0.02	0.021 J	0.012 U
Chloroform	0.003 J	0.012 U	0.013 U	0.012 U
Ethylbenzene	0.012 UJ	0.012 U	0.013 UJ	0.46
Tetrachloroethene	0.021 J	0.012 U	0.012 J	0.003 J
Toluene	0.002 J	0.012 U	0.013 UJ	0.002 J
Xylene	0.002 J	0.012 U	0.013 UJ	2.9
Semivolatile Organic Compounds				
Acenaphthene	0.037 J	0.41 U	0.14 J	0.048 J
Acenaphthylene	0.66	0.41 U	0.048 J	0.74 J
Anthracene	0.78	0.025 J	0.93	0.52 J
Benzo(a)anthracene	7.8 D	0.15 J	2.3	3.2 J
Benzo(a)pyrene	7 D	0.15 J	2.4 J	0.7 JD
Benzo(b)fluoranthene	9.7 D	0.14 J	2.2 J	2.1 J
Benzo(g,h,i)perylene	3.2 D	0.066 J	1.2 J	2.5 J
Benzo(k)fluoranthene	9.8 D	0.19 J	2.1 J	3.2 J
Carbazole	0.073 J	0.027 J	0.15 J	0.04 J
Chrysene	7.1 D	0.16 J	2.3	3.3 J
Dibenz(a,h)anthracene	1	0.41 U	0.27 J	0.54 J
Dibenzofuran	0.028 J	0.41 U	0.1 J	0.038 J
Diethylphthalate	0.41 U	0.41 U	0.039 J	0.028 J
di-n-Butyl Phthalate	0.41 U	0.41 U	0.14 J	0.18 J
di-n-Octyl Phthalate	0.41 U	0.41 U	0.42 UJ	0.073 J
Fluoranthene	10 D	0.25 J	7.2 D	0.73 JD
Fluorene	0.04 J	0.41 U	0.25 J	0.12 J
Indeno(1,2,3-cd)pyrene	3.1 D	0.068 J	1.2 J	1.7 J
2-Methylnaphthalene	0.41 U	0.41 U	0.039 J	0.078 J
4-Methylphenol	0.1 J	0.41 U	0.42 U	0.41 U
Naphthalene	0.025 J	0.41 U	0.1 J	0.12 J

Table V - 1

SUMMARY OF ANALYTES DETECTED DURING THE EXPANDED SITE INVESTIGATION, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Analyte	Sample Number ESI03/SS-25 (mg/kg)	ESI04/SS-26 (mg/kg)	ESI05/SS-11 (mg/kg)	ESI15/SS-10 (mg/kg)
Phenanthrene	0.82	0.097 J	2.8 J	1.7 J
Pyrene	15 D	0.25 J	10 D	1 D
Pesticides/PCBs				
alpha-Chlordane	0.0021 U	0.00277 PJ	0.0148 PJ	0.00784 PJ
gamma-Chlordane	0.0021 U	0.0021 U	0.0144	0.00938
4,4'-DDD	0.00665 PJ	0.00571 PJ	0.0312 PJ	0.00902 PJ
4,4'-DDE	0.004 U	0.00678	0.0225 PJ	0.0117 PJ
4,4'-DDT	0.0217 PJ	0.0155 PJ	0.0259 PJ	0.0178 PJ
Endosulfan II	0.0171 J	0.0041 U	0.00633 PJ	0.0041 U
Endrin	0.004 U	0.0041 U	0.00924 PJ	0.0045 PJ
Inorganics				
Aluminum	5,200	14,590	7,326	6,003 J
Antimony	6.3 UJL	7 UJL	20.8 BJL	15.9 JL
Arsenic	10.8	23.7	14.7	27.2
Barium	251 JH	876 JH	1,038 JH	945
Beryllium	0.35 JL	1.6 JL	1.7 JL	0.85
Cadmium	0.98 UJ	2 J	2.7 J	4.8
Calcium	14,752	20,427	27,614	31,025 J
Chromium	10.4	51.1	90.7	63.2 J
Cobalt	5	15.5	17.2	14.7
Copper	85.4 J	465 J	663 J	2,522
Iron	10,337 J	85,749 J	130,954 J	77,434 J
Lead	306	1,532	2,223	1,829 J
Magnesium	2,161 J	3,347 J	1,986 J	2,910 J
Manganese	245	689	944	688 J
Mercury	0.15	1.2	3.4	2.2
Nickel	11.5	62	86.5	52.2
Potassium	882	2,645	666	1,168
Silver	0.98 U	3.5	4.3	5.8

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Table V - 1

SUMMARY OF ANALYTES DETECTED DURING THE EXPANDED SITE INVESTIGATION, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Analyte	Sample Number			
	ESI03/SS-25 (mg/kg)	ESI04/SS-26 (mg/kg)	ESI05/SS-11 (mg/kg)	ESI15/SS-10 (mg/kg)
Sodium	96.5 J	272 J	265 J	252
Thallium	0.48 JH	0.36 BJH	0.26 UJH	0.71 U
Vanadium	11.8	30.8	17.9	20.5
Zinc	636	1,693	3,312	1,836 J

B[a]	Concentration in sample is greater than 10 times the concentration in any blank for common laboratory contaminants, or greater than five times the concentration in any blank for other contaminants.
J, JD, JH, JKL[a]	Sample concentration is below the instrument quantitation limit but above the instrument detection limit, or is outside of the range of the instrument calibration standards used for the analysis, and is an estimate of the actual value.
JB[b]	Concentration in sample is less than 10 times the concentration found in any blank for common laboratory contaminants, or less than five times the concentration in any blank for other contaminants.
D	Sample extract was diluted.
R[b]	Sample concentration results were rejected by the laboratory due to preparation or analysis difficulties.
U, UD, UJ, UJL, UJH[a]	Sample concentration is below the instrument detection limit. Value is divided by two for use in the risk assessment.
UJB[b]	Concentration in sample is less than 10 times the concentration found in any blank for common laboratory contaminants, or less than five times the concentration in any blank for other contaminants.
PJ	The two columns differed by more than 25% and the lower concentration is reported.

[a] Data used in the risk assessment.

[b] Data not used in the risk assessment.

Source: Ecology and Environment, Inc., 1994.

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Table V - 2

SURFACE SOIL DATA SUMMARY
FOR THE EXPANDED SITE INVESTIGATION, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Analyte	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)
Volatile Organic Compounds				
1,1,1-Trichloroethane	0/4	0	NA	NA
1,1,2,2-Tetrachloroethane	0/4	0	NA	NA
1,1,2-Trichloroethane	0/4	0	NA	NA
1,1-Dichloroethane	0/4	0	NA	NA
1,1-Dichloroethene	0/4	0	NA	NA
1,2-Dichloroethane	0/4	0	NA	NA
1,2-Dichloroethene	0/4	0	NA	NA
1,2-Dichloropropane	0/4	0	NA	NA
2-Butanone	0/4	0	NA	NA
2-Hexanone	0/4	0	NA	NA
4-Methyl-2-pentanone	0/4	0	NA	NA
Acetone *	2/4	50	0.02	0.021
Benzene	0/4	0	NA	NA
Bromodichloromethane	0/4	0	NA	NA
Bromoform	0/4	0	NA	NA
Bromomethane	0/4	0	NA	NA
Carbon Disulfide	0/4	0	NA	NA
Carbon Tetrachloride	0/4	0	NA	NA
Chlorobenzene	0/4	0	NA	NA
Chloroethane	0/4	0	NA	NA
Chloroform *	1/4	25	0.003	0.003
Chloromethane	0/4	0	NA	NA
cis-1,3-Dichloropropene	0/4	0	NA	NA
Dibromochloromethane	0/4	0	NA	NA
Ethylbenzene *	1/4	25	0.46	0.46
Styrene	0/4	0	NA	NA
Tetrachloroethene *	3/4	75	0.003	0.021
Toluene *	2/4	50	0.002	0.002
trans-1,3-Dichloropropene	0/4	0	NA	NA
Trichloroethene	0/4	0	NA	NA
Vinyl Chloride	0/4	0	NA	NA
Xylene *	2/4	50	0.002	2.9
Semivolatile Organic Compounds				
1,2,4-Trichlorobenzene	0/4	0	NA	NA
1,2-Dichlorobenzene	0/4	0	NA	NA
1,3-Dichlorobenzene	0/4	0	NA	NA
1,4-Dichlorobenzene	0/4	0	NA	NA
2,2'-oxybis(1-Chloropropane)	0/4	0	NA	NA
2,4,5-Trichlorophenol	0/4	0	NA	NA
2,4,6-Trichlorophenol	0/4	0	NA	NA
2,4-Dichlorophenol	0/4	0	NA	NA
2,4-Dimethylphenol	0/4	0	NA	NA
2,4-Dinitrophenol	0/4	0	NA	NA
2,4-Dinitrotoluene	0/4	0	NA	NA

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Table V - 2

SURFACE SOIL DATA SUMMARY
FOR THE EXPANDED SITE INVESTIGATION, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Analyte	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)
2,6-Dinitrotoluene	0/4	0	NA	NA
2-Chloronaphthalene	0/4	0	NA	NA
2-Chlorophenol	0/4	0	NA	NA
2-Methylnaphthalene *	2/4	50	0.039	0.078
2-Methylphenol	0/4	0	NA	NA
2-Nitroaniline	0/4	0	NA	NA
2-Nitrophenol	0/4	0	NA	NA
3,3'-Dichlorobenzidine	0/4	0	NA	NA
3-Nitroaniline	0/4	0	NA	NA
4,6-Dinitro-2-methylphenol	0/4	0	NA	NA
4-Bromophenyl-phenylether	0/4	0	NA	NA
4-Chloro-3-methylphenol	0/4	0	NA	NA
4-Chloroaniline	0/4	0	NA	NA
4-Chlorophenyl-phenylether	0/4	0	NA	NA
4-Methylphenol *	1/4	25	0.1	0.1
4-Nitroaniline	0/4	0	NA	NA
4-Nitrophenol	0/4	0	NA	NA
Acenaphthene *	3/4	75	0.037	0.14
Acenaphthylene *	3/4	75	0.048	0.74
Anthracene *	4/4	100	0.025	0.93
Benzo(a)anthracene *	4/4	100	0.15	7.8
Benzo(a)pyrene *	4/4	100	0.15	7
Benzo(b)fluoranthene *	4/4	100	0.14	9.7
Benzo(g,h,i)perylene *	4/4	100	0.066	3.2
Benzo(k)fluoranthene *	4/4	100	0.19	9.8
Bis(2-chloroethoxy)methane	0/4	0	NA	NA
Bis(2-chloroethyl)ether	0/4	0	NA	NA
Butylbenzylphthalate	0/4	0	NA	NA
Carbazole *	4/4	100	0.027	0.15
Chrysene *	4/4	100	0.16	7.1
Di-n-butylphthalate *	2/4	50	0.14	0.18
Di-n-octylphthalate *	1/4	25	0.073	0.073
Dibenz(a,h)anthracene *	3/4	75	0.27	1
Dibenzofuran *	3/4	75	0.028	0.1
Diethylphthalate *	2/4	50	0.028	0.039
Dimethylphthalate	0/4	0	NA	NA
Fluoranthene *	4/4	100	0.25	10
Fluorene *	3/4	75	0.04	0.25
Hexachlorobenzene	0/4	0	NA	NA
Hexachlorobutadiene	0/4	0	NA	NA
Hexachlorocyclopentadiene	0/4	0	NA	NA
Hexachloroethane	0/4	0	NA	NA
Indeno(1,2,3-cd)pyrene *	4/4	100	0.068	3.1
Isophorone	0/4	0	NA	NA
N-Nitroso-di-n-propylamine	0/4	0	NA	NA

Table V - 2

SURFACE SOIL DATA SUMMARY
FOR THE EXPANDED SITE INVESTIGATION, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Analyte	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)
N-Nitrosodiphenylamine	0/4	0	NA	NA
Naphthalene *	3/4	75	0.025	0.12
Nitrobenzene	0/4	0	NA	NA
Pentachlorophenol	0/4	0	NA	NA
Phenanthrene *	4/4	100	0.097	2.8
Phenol	0/4	0	NA	NA
Pyrene *	4/4	100	0.25	15
Pesticides/PCBs				
4,4'-DDD *	4/4	100	0.00571	0.0312
4,4'-DDE *	3/4	75	0.00678	0.0225
4,4'-DDT *	4/4	100	0.0155	0.0259
Aldrin	0/4	0	NA	NA
alpha-BHC	0/4	0	NA	NA
Alpha-Chlordane *	3/4	75	0.00277	0.0148
Aroclor 1016	0/4	0	NA	NA
Aroclor 1221	0/4	0	NA	NA
Aroclor 1232	0/4	0	NA	NA
Aroclor 1242	0/4	0	NA	NA
Aroclor 1248	0/4	0	NA	NA
Aroclor 1254	0/4	0	NA	NA
Aroclor 1260	0/4	0	NA	NA
beta-BHC	0/4	0	NA	NA
delta-BHC	0/4	0	NA	NA
Dieldrin	0/4	0	NA	NA
Endosulfan I	0/4	0	NA	NA
Endosulfan-II *	2/4	50	0.00633	0.0171
Endosulfan Sulfate	0/4	0	NA	NA
Endrin *	2/4	50	0.0045	0.00924
Endrin Aldehyde	0/4	0	NA	NA
Endrin Ketone	0/4	0	NA	NA
gamma-BHC	0/4	0	NA	NA
Gamma-Chlordane *	2/4	50	0.00938	0.0144
Heptachlor	0/4	0	NA	NA
Heptachlor Epoxide	0/4	0	NA	NA
Methoxychlor	0/4	0	NA	NA
Toxaphene	0/4	0	NA	NA
Inorganics				
Aluminum *	4/4	100	5,200	14,590
Antimony *	1/3	33.3	15.9	15.9
Arsenic *	4/4	100	10.8	27.2
Barium *	4/4	100	251	1,038
Beryllium *	4/4	100	0.35	1.7
Cadmium *	3/4	75	2	4.8
Calcium *	4/4	100	14,752	31,025
Chromium *	4/4	100	10.4	90.7

Table V - 2

SURFACE SOIL DATA SUMMARY
FOR THE EXPANDED SITE INVESTIGATION, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Analyte	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)
Cobalt *	4/4	100	5	17.2
Copper *	4/4	100	85.4	2,522
Iron *	4/4	100	10,337	130,954
Lead *	4/4	100	306	2,223
Magnesium *	4/4	100	1,986	3,347
Manganese *	4/4	100	245	944
Mercury *	4/4	100	0.15	3.4
Nickel *	4/4	100	11.5	86.5
Potassium *	4/4	100	666	2,645
Silver *	3/4	75	3.5	5.8
Sodium *	4/4	100	96.5	272
Thallium *	1/3	33.3	0.48	0.48
Vanadium *	4/4	100	11.8	30.8
Zinc *	4/4	100	636	3,312

* - Selected for evaluation in the Phase I ERA.

Source: Ecology and Environment, Inc., 1994.

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Table V - 3

PLANT SPECIES THAT OCCUR OR MAY POTENTIALLY OCCUR ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Genus Species	Levees/Middens
Acer rubrum	*
Ambrosia artemisiifolia	*
Ambrosia trifida	*
Ampelopsis arborea	*
Andropogon glomeratus	*
Arisaema dracontium	*
Asplenium platyneuron	*
Baccharis halimifolia	*
Berchemia scandens	*
Bidens pilosa	*
Brunnichia cirrhosa	*
Bumelia lanuginosa	*
Callicarpa americana	*
Calystegia sepium	*
Campsis radicans	*
Cardamine pensylvanica	*
Carya illinoensis	*
Celtis laevigata	*
Cepyhalanthus occidentalis	*
Cirsium horridulum	*
Commelina diffusa	*
Diodia virginiana	*
Diospyros virginiana	*
Eclopta alba	*
Eluymus virginicus	*
Erechtites hieracifolia	*
Erigeron philadelphicus	*
Eryngium yuccifolium	*
Eupatorium capillifolium	*
Eupatorium coelestinum	*
Euthania leptocephala	*
Fraxinius pennsylvanica	*
Galactia macreei	*
Galium tinctorium	*
Gleditsia triacanthos	*
Helenium amarum	*
Helenium flexuosum	*
Helianthus floridanus	*
Hypericum hypericoides	*
Ilex decidua	*
Ilex opaca	*
Ilex vomitoria	*
Ipomoea trichocarpa	*
Iva frutescens	*
Jacquemontia tamnifolia	*

Table V - 3

PLANT SPECIES THAT OCCUR OR MAY POTENTIALLY OCCUR ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Genus Species	Levees/Middens
Lantana horrida	*
Llgustrum sinense	*
Liguidambar styraciflua	*
Lonicera japonica	*
Matelea gonocarpa	*
Melia azedarach	*
Mikania scandens	*
Morus alba	*
Morus rubra	*
Myrica cerifera	*
Oenothera fruticosa	*
Osmunda cinnamonea	*
Panicum dishotomiflorum	*
Parietaria floridana	*
Parthenocissus quinquefolia	*
Passiflora incarnata	*
Passiflora lutea	*
Persea palustris	*
Phragmites australis	*
Physalis pubescens	*
Phytolacca americana	*
Pinus elloittii	*
Polymnia uvedalia	*
Populus deltoides	*
Prunus caroliniana	*
Pteridium aquilinum	*
Phrrhopappus carolinianus	*
Quercus nigra	*
Quercus virginiana	*
Phamnus caroliniana	*
Phus copallina	*
Rhus cadicans	*
Rubus spp.	*
Sabal minor	*
Salix nigra	*
Sambucus canadensis	*
Sapium sebiferum	*
Saururus cernuus	*
Sebatia stellaris	*
Senecio glabellus	*
Serenoa repens	*
Sida rhombifolia	*
Smilax bona-nox	*
Smilax glauca	*
Smilax smallii	*
Solanum americanum	*

Table V - 3

PLANT SPECIES THAT OCCUR OR MAY POTENTIALLY OCCUR ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Genus Species	Levees/Middens
Solidago rugosa	*
Soidago stricta	*
Stellaria media	*
Taxodium distichum	*
Tillandsia usneoides	*
Tradescantia ohioensis	*
Ulmus americana	*
Verbena brasiliensis	*
Verbesina virginica	*
Vigna luteola	*
Viola sp.	*
Vitis rotundifolia	*
Zanthoxylum clava-herculis	*

a USFWS 1993.

Source: Ecology and Environment, Inc., 1994.

001160.1102

TABLE V - 4

MAMMALS THAT POTENTIALLY INHABIT THE UNDEVELOPED LANDFILL AND SURROUNDING AREAS AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Common Name	Genus species
Swamp Rabbit[a,b]	*Sylvilagus aquaticus*
Eastern Cottontail[a,b,c]	*Sylvilagus floridanus*
European Rabbit[a]	*Oryctolagus cuniculis*
Gray Squirrel[b]	*Sciurus carolinensis*
Fox Squirrel[b]	*Sciurus niger*
Southern Flying Squirrel[b]	*Glaucomys volans*
Eastern Mole[b]	*Scalopus aquaticus*
Short-tailed Shrew[a,b]	*Blarina brevicauda*
Least Shrew[a,b]	*Cryptotis parva*
Eastern Harvest Mouse[a,b]	*Reithrodontomys humulis*
Fulvous Harvest Mouse[a,b]	*Reithrodontomys fulvescens*
White-footed Mouse[a, b]	*Peromyscus leucopus*
Cotton Mouse[a,b]	*Peromyscus gossypinus*
House Mouse[b]	*Mus domesticus*
Marsh Rice Rat[b]	*Oryzomys palustris*
Hispid Cotton Rat[b]	*Sigmodon hispidus*
Eastern Wood Rat[a,b]	*Neotoma floridana*
Black Rat[b]	*Rattus rattus*
Norway Rat[b]	*Rattus norvegicus*
Long-tailed Weasel[b]	*Mustela frenata*
Northern Raccoon[b]	*Procyon lotor*
Virginia Opossum[b]	*Didelphis virginiana*
Southeastern Myotis[a,b]	*Myotis austroriparius*
Seminole Bat[b]	*Lasiurus seminolus*
Northern Yellow Bat[b]	*Lasiurus intermedius*
Rafinesque's Big-eared Bat[b]	*Plecotus rafinesquii*
Brazilian Free-tailed Bat[b]	*Tadarida brasiliensis*
Eastern Pipistrelle[b]	*Pipistrellus subflavus*
Big-Brown Bat[b]	*Eptesicus fuscus*
Red Bat[b]	*Lasiurus borealis*
Evening Bat[b]	*Nycticeius humeralis*

a - Whitaker 1980.

b - U.S. Fish and Wildlife Service 1993.

c - E & E 1994.

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Table V - 5

BIRDS WHICH POTENTIALLY INHABIT THE UNDEVELOPED LANDFILL AND SURROUNDING AREAS AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Common Name	Genus Species
Pied-billed Grebe	*Podilymbus podiceps*
American White Pelican	*Pelecanus erythrorhynchos*
Double-crested Cormorant	*Phalacrocorax auritus*
Green-backed Heron[b]	*Butorides virescens*
Great Blue Heron	*Ardea herodias*
Little Blue Heron	*Florida caerulea*
Cattle Egret	*Bubulcus ibis*
Common Egret	*Casmerodius albus*
Snowy Egret	*Leucophoyx thula*
Louisiana Heron	*Hydranassa tricolor*
Yellow-crowned Night Heron	*Nycticorax violacea*
Least Bittern	*Ixobrychus exilis*
Glossy Ibis	*Plegadis falcinellus*
White-faced Ibis	*Plegadis chihi*
White Ibis	*Eudocimus albus*
Mallard	*Anus platyrhynchos*
Mottled Duck	*Anas fulvigula*
Wood Duck	*Aix sponsa*
Gadwall	*Anus strepera*
Green-winged Teal	*Anus carolinensis*
Blue-winged Teal	*Anus discors*
Northern Pintail	*Anas acuta*
American Widgeon	*Mareca americana*
Lesser Scaup	*Aythya affinis*
Ring-necked Duck	*Aythya collaris*
Northern Shoveler	*Spatula clypeata*
Ruddy Duck	*Oxyura jamaicensis*
Red-breasted Merganser	*Mergus serrator*
Turkey Vulture	*Cathartes aura*
Sharp-shinned Hawk	*Accipiter striatus*
Red-tailed Hawk[c]	*Buteo jamaicensis*
Red-shoulder Hawk[c]	*Buteo lineatus*
American Kestrel[c]	*Falco sparverius*
Mississippi Kite[c]	*Ictinia mississipiensis*
Northern Harrier	*Circus cyaneus*
Broad-winged Hawk	*Buteo platypterus*
Bobwhite	*Colinus virginianus*
King Rail	*Rallus elegans*
Clapper Rail	*Rallus longirostris*
Virginia Rail	*Rallus limicola*
Sora	*Porzana carolina*
Common Gallinule	*Gallinula chloropus*
Purple Gallinule	*Porphyrula martinica*
American Coot	*Fulica americana*
Killdeer	*Charadrius vociferus*

Table V - 5

BIRDS WHICH POTENTIALLY INHABIT THE UNDEVELOPED LANDFILL AND SURROUNDING AREAS AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Common Name	Genus Species
Black-bellied Plover	*Squatarola squatarola*
Lesser Yellowlegs	*Totanus flavipes*
Least Sandpiper	*Erolia minutilla*
Pectoral Sandpiper	*Calidris melanotos*
Dunlin	*Erolia alpina*
Short-billed Dowitcher	*Limnodromus griseus*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Western Sandpiper	*Ereunetes mauri*
Black-necked Stilt	*Himantopus mexicanus*
Herring Gull	*Larus argentatus*
Ring-billed Gull	*Larus delawarensis*
Laughing Gull	*Larus atricilla*
Forster's Tern	*Sterna forsteri*
Least Tern	*Sterna albifrons*
Royal Tern	*Thalasseus maximus*
Caspian Tern	*Hydroprogne caspia*
Mourning Dove	*Zenaidura macroura*
Rock Dove	*Columbia livia*
Yellow-billed Cuckoo	*Coccyzus americanus*
Common Nighthawk	*Chordeiles minor*
Chimney Swift	*Chaetura pelagica*
Ruby-throated Hummingbird	*Archilochus colubris*
Belted Kingfisher	*Megaceryle alcyon*
Red-bellied Woodpecker	*Centurus carolinus*
Downy Woodpecker	*Picoides pubescens*
Northern Flicker	*Colaptes auratus*
Eastern Kingbird	*Tyrannus tyrannus*
Eastern Wood-Pewee	*Contopus virens*
Eastern Phoebe	*Sayornis phoebe*
Great Crested Flycatcher	*Myiarchus crinitus*
Tree Swallow	*Iridoprocne bicolor*
Barn Swallow	*Hirundo rustica*
Purple Martin	*Progne subis*
Blue Jay[b]	*Cyanocitta cristata*
American Crow[b]	*Corvus brachyrhynchos*
Fish Crow	*Corvus ossifragus*
Carolina Chickadee	*Parus carolinensis*
House Wren	*Troglodytes aedon*
Marsh Wren	*Cistothorus sp.*
Carolina Wren	*Thryothorus ludovicianus*
Mockingbird	*Mimus polyglottos*
Gray Catbird	*Dumetella carolinensis*
Brown Thrasher[b]	*Toxostoma rufum*
American Robin	*Turdus migratorius*
Wood Thrush	*Hylocichla mustelina*
Swainson's Thrush	*Hylocichla ustulata*

Table V - 5

BIRDS WHICH POTENTIALLY INHABIT THE UNDEVELOPED LANDFILL AND SURROUNDING AREAS AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Common Name	Genus Species
Cedar Waxwing	*Bombycilla cedrorum*
Loggerhead Shrike	*Lanius ludovicianus*
Ruby-crowned Kinglet	*Regulus calendula*
Blue-gray Gnatcatcher	*Polioptila caerulea*
European Starling	*Sturnus vulgaris*
White-eyed Vireo	*Vireo griseus*
Prothonotary Warbler	*Protonotaria citrea*
Tennessee Warbler	*Vermivora peregrina*
Orange-crowned Warbler	*Vermivora celata*
Northern Parula Warbler	*Parula americana*
Yellow Warbler	*Dendroica petechia*
Black-throated Green Warbler	*Dendroica virens*
Magnolia Warbler	*Dendroica magnolia*
Yellow-rumped Warbler	*Dendroica coronata*
Black and White Warbler	*Mnioltila varia*
Common Yellowthroat	*Geothlypis trichas*
Hooded Warbler	*Wilsonia citrina*
American Redstart	*Setophaga ruticilla*
Eastern Meadowlark	*Sturnella manga*
Rufous-sided Towhee	*Pipilo erythrophthalmus*
Brown-headed Cowbird	*Molothrus ater*
Red-winged Blackbird	*Agelius phoeniceus*
Orchard Oriole	*Icterus spurius*
Boat-tailed Grackle	*Cassidix mexicanus*
Common Grackle	*Quiscalus quiscula*
Summer Tanager	*Piranga rubra*
Northern Cardinal[b]	*Richmondena cardinalis*
Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Blue Grosbeak	*Guiraca caerulea*
Indigo Bunting	*Passerina cyanea*
Painted Bunting	*Passerina ciris*
American Goldfinch	*Spinus tristis*
House Sparrow	*Passer domesticus*
Chipping Sparrow	*Spizella passerina*
Savannah Sparrow	*Passerculus sandwichensis*
White-throated Sparrow	*Zonotrichia albicollis*
Swamp Sparrow	*Melospiza georgiana*
Song Sparrow	*Mesospiza melodia*

[a] U.S. Fish and Wildlife Serivice 1993

[b] E & E 1994a

[c] E & E 1994b

Source: Ecology and Environment, Inc., 1994.

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Table V - 6

RARE, ENDANGERED, THREATENED, OR SENSITIVE PLANT AND ANIMAL SPECIES THAT POTENTIALLY INHABIT THE AREAS[a,b] SURROUNDING THE UNDEVELOPED LANDFILL THE UNDEVELOPED LANDFILL

AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Common Name	Genus Species
Plants	
Floating Antler-Fern	*Ceratopteris pteridoides*
Gummy Lovegrass	*Eragrostis curtipedicellata*
Punctate Cupgrass	*Eriochloa punctata*
Saltflat Grass	*Monanthochloe littoralis*
Single-spike Paspalum	*Paspalum monostachyum*
Sea Oats	*Uniola paniculata*
Creeping Spike-rush	*Eleocharis fallax*
Three-angle Spike-rush	*Eleocharis tricostata*
Short-beaked Bald-rush	*Psilocarya nitens*
Golden Canna	*Canna flaccida*
Powdery Thalia	*Thalia dealbata*
Coastal Plain Willow	*Salix caroliniana*
Gregg's Amaranth	*Amaranthus greggii*
Woolly Honeysweet	*Tidestromia lanuginosa*
Blue Water-lily	*Nymphaea elegans*
Nuttall Milk-vetch	*Astragalus nuttallianus*
Notch-tipped Dalea	*Dalea emarginata*
Roundleaf Scarf-pea	*Psoralea rhombifolia*
Narrow-leaved Puccoon	*Lithospermum incisum*
Lindheimer's Bee-balm	*Monarda lindheimeri*
Correll's False Dragon-head	*Physostegia correllii*
Thieret's Skullcap	*Scutellaria thieretii*
Purple Bladderwort	*Utricularia purpurea*
Night-blooming Ruellia	*Ruellia noctiflora*
Camphor Daisy	*Machaeranthera phyllocephala*
Blackroot	*Pterocaulon virgatum*
Mexican Hat	*Ratibida peduncularis*
Pondberry	*Lindera melissifolia*
Fish	
Saltmarsh Topminnow	*Fundulus jenkinsi*
Pallid Sturgeon	*Scaphirhynchus albus*
Gulf Sturgeon	*Acipenser oxyrhynchus desoti*
Reptiles	
Mississippi Diamondback Terrapin	*Malaclemys terrapin*
Ornate Box Turtle	*Terrapene ornata*
Birds	
American White Pelican	*Pelecanus erythrorhynchos*
Roseate Spoonbill	*Ajaia ajaja*
Crested Caracara	*Polyborus plancus*
Peregrine Falcon	*Falco peregrinus*
Black Rail	*Laterallus jamaicensis*
Sandhill Crane	*Grus canadensis*
Snowy Plover	*Charadrius alexandrinus*

Table V - 6

RARE, ENDANGERED, THREATENED, OR SENSITIVE PLANT AND ANIMAL SPECIES THAT POTENTIALLY INHABIT THE AREAS[a,b] SURROUNDING THE UNDEVELOPED LANDFILL THE UNDEVELOPED LANDFILL

AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Common Name	Genus Species
Piping Plover	*Charadrius melodus*
Least Tern	*Sterna antillarum*
White-winged Dove	*Zenaida asiatica*
Groove-billed Ani	*Crotophaga sulcirostris*
Short-eared Owl	*Asio flammeus*
Whooping Crane	*Grus americana*
Eskimo Curlew	*Numenius borealis*
Osprey	*Pandion haliaetus*
Bald Eagle	*Haliaeetus leucocephalus*
Brown Pelican	*Pelecanus occidentalis*
Greater Prairie-chicken	*Tympanuchus cupido*
Wood Stork	*Mycteria americana*
Bachman's Warbler	*Vermivora bachmanii*
Ivory-billed Woodpecker	*Campephilus principalis*
Red-cockaded Woodpecker	*Picoides borealis*
Black-capped Vireo	*Vireo atricapillus*
Mammals	
Red Wolf	*Canis rufus*
Gray Bat	*Myotis grisescens*
Indiana Bat	*Myotis sodalis*
Louisiana Black Bear	*Ursus americanus luteolus*
Florida Panther	*Felis concolor corvi*
Herps	
American Alligator	*Alligator mississippiensis*
Gopher Tortoise	*Gopherus polyphemus*
Ringed Sawback Turtle	*Graptemys oculifera*
Miscellaneous	
Inflated Heelsplitter	*Potamilus inflatus*
Louisiana Pearlshell	*Margaritifera hembeli*

[a] LADWF 1988

[b] USEPA 1992c

Source: Ecology and Environment, Inc., 1994.

Table V - 7

SUMMARY OF TRANSPORT AND FATE CHARACTERISTICS FOR SURFACE SOIL STRESSORS DETECTED ON THE UNDEVELOPED LANDFILL DURING THE EXPANDED SITE INVESTIGATION[a], PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor [b]	Surface Soil			
	Adsorption	Wind Erosion	Surface Water Runoff	Vertical Migration
Semivolatile Organics				
Polycyclic Aromatic Hydrocarbons				
Low Molecular Weight	moderate	moderate	low	moderate
Medium Molecular Weight	moderate	moderate	low	moderate
High Molecular Weight	high	moderate	low	low
Pesticides				
DDTR [c, d]	high	moderate	low	low
Inorganics				
Arsenic	high	moderate	low	low
Cadmium	moderate	moderate	low	moderate
Lead	moderate	moderate	low	moderate
Mercury	high	moderate	low	low
Zinc	high	moderate	low	moderate

Table V - 7

SUMMARY OF TRANSPORT AND FATE CHARACTERISTICS FOR SURFACE SOIL STRESSORS DETECTED ON THE UNDEVELOPED LANDFILL DURING THE EXPANDED SITE INVESTIGATION[a], PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor [b]	Biota Translocation		Transformation		
	Bioaccumulation	Biomagnification	Volatilization	Photo-oxidation	Microbial Metabolism
Semivolatile Organics					
Polycyclic Aromatic Hydrocarbons					
Low Molecular Weight	low	low	high	NDA	high
Medium Molecular Weight	moderate	low	moderate	NDA	high
High Molecular Weight	high	low	low	NDA	high
Pesticides					
DDTR [c, d]	high	high	high	low	NDA
Inorganics					
Arsenic	high	low	NDA	NDA	NDA
Cadmium	high	low	NDA	NDA	NDA
Lead	high	low	NDA	NDA	NDA
Mercury	high	high	high [e]	NDA	NDA
Zinc	moderate	low	NDA	NDA	NDA

a - *Transport and Fate summaries for each SOPC are presented in Section U.2.2.5.2 of the Phase I ERA.*

b - Stressors presented in this summary table represent a subset of the complete list of surface soil stressors selected selected for the Phase I ERA.

c - DDTR consists of 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE.

d - The summary of Transport and Fate Characteristics for DDTR represents characteristics for other organo-chlorine pesticides with similar physio-chemical properties.

e - Elemental mercury.

NDA - No data available.

Source: Ecology and Environment, Inc., 1994.

Table V - 8

LOG K_{ow}s, BAFs, AND PUFs USED TO CALCULATE PLANT, EARTHWORM, SMALL MAMMAL, AND BIRD TISSUE CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Log K_{ow}	Plant Uptake Factors (PUFs) (Reproductive)	Earthworm Bioaccumulation Factors (BAFs)	Small Mammal Bioaccumulation Factors (BAFs)	Bird Bioaccumulation Factors (BAFs)
Volatile Organic Compounds					
Acetone	-0.24 [a]	NE [b]	1.0 [c]	1.0 [c]	1.0 [c]
Chloroform	1.97 [d]	2.81 [e]	1.0 [c]	1.0 [c]	1.0 [c]
1,1-Dichloroethene	1.84 [a]	3.35 [e]	1.0 [c]	1.0 [c]	1.0 [c]
1,2-Dichloroethene	0.7 [a]	NE [b]	1.0 [c]	1.0 [c]	1.0 [c]
Ethylbenzene	3.15 [a]	0.585 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Tetrachloroethene	2.6 [a]	1.22 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Toluene	2.73 [a]	1.02 [e]	1.0 [c]	1.0 [c]	1.0 [c]
1,1,1-Trichloroethane	2.5 [a]	1.39 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Xylene	3.26 [a]	0.505 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Semivolatile Organic Compounds					
Acenaphthene	4.0 [a]	**2.3** [f] 0.189 [e]	**0.3** [g] 60.4 [f]	31 [f]	1.0 [c]
Acenaphthylene	3.7 [a]	0.281 [e]	0.22 [g]	1.0 [c]	1.0 [c]
Anthracene	4.45 [a]	0.104 [e]	**0.05** [h] 0.32 [g]	1.0 [c]	1.0 [c]
Benzo(a)anthracene	5.6 [a]	0.0224 [e]	**0.1** [h] 0.27 [g]	1.0 [c]	1.0 [c]
Benzo(a)pyrene	6.06 [a]	0.0122 [e]	**0.3** [h] 0.34 [g]	1.0 [c]	1.0 [c]
Benzo(b)fluoranthene	6.06 [a]	0.0122 [e]	**0.3** [h] 0.21 [g]	1.0 [c]	1.0 [c]
Benzo(g,h,i)perylene	6.51 [a]	0.00669 [e]	**0.2** [h] 0.15 [g]	1.0 [c]	1.0 [c]
Benzo(k)fluoranthene	6.06 [a]	0.0122 [e]	**0.3** [h] 0.21 [g]	1.0 [c]	1.0 [c]
Bis(2-ethylhexyl)phthalate	9.61 [a]	NE [b]	1.0 [c]	1.0 [c]	1.0 [c]
Butylbenzylphthalate	5.56 [a]	0.0237 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Carbazole	3.29 [i]	0.486 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Chrysene	5.61 [a]	0.0222 [e]	**0.2** [h] 0.44 [h]	1.0 [c]	1.0 [c]
Dibenz(a,h)anthracene	6.8 [a]	0.00455 [e]	0.49 [g]	1.0 [c]	1.0 [c]
Dibenzofuran	4.12 [a]	0.161 [e]	1.0 [c]	1.0 [c]	1.0 [c]

Table V - 8

LOG K_{ow}s, BAFs, AND PUFs USED TO CALCULATE PLANT, EARTHWORM, SMALL MAMMAL, AND BIRD TISSUE CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Log K_{ow}	Plant Uptake Factors (PUFs) (Reproductive)	Earthworm Bioaccumulation Factors (BAFs)	Small Mammal Bioaccumulation Factors (BAFs)	Bird Bioaccumulation Factors (BAFs)
Diethylphthalate	2.5 [a]	1.39 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Di-N-butyl phthalate	5.6 [a]	0.0224 [e]	1.0 [c]	1.0 [c]	1.0 [c]
Di-N-octylphthalate	NDA	1.0 [c]	1.0 [c]	1.0 [c]	1.0 [c]
Fluoranthene	4.9 [a]	0.057 [e]	**0.08** [h] 0.37 [g]	1.0 [c]	1.0 [c]
Fluorene	4.2 [a]	0.145 [e]	0.2 [g]	1.0 [c]	1.0 [c]
Indeno(1,2,3-cd)pyrene	6.5 [a]	0.00678 [e]	**0.4** [h] 0.41 [g]	1.0 [c]	1.0 [c]
4-Methylphenol	1.97 [a]	2.81 [e]	1.0 [c]	1.0 [c]	1.0 [c]
2-Methylnaphthalene	4.1 [a]	0.165 [e]	0.2 [g]	1.0 [c]	1.0 [c]
Naphthalene	3.29 [a]	0.486 [e]	0.21 [g]	1.0 [c]	1.0 [c]
Phenanthrene	4.46 [a]	0.102 [e] **14.7** [f]	**0.1** [h] 30.5 [f] 0.28 [g]	12 [f]	1.0 [c]
Pyrene	4.88 [a]	0.0585 [e]	**0.09** [h] 0.39 [g]	1.0 [c]	1.0 [c]
Pesticides/PCBs					
Aldrin	3.01 [ac]	0.705 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
alpha-BHC	3.9 [a]	0.216 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Aroclor-1254	6.47 [l]	0.00705 [e]	1.0 [c]	1.0 [c]	55.2 [m]
Aroclor-1260	7.15 [a]	0.00285 [e]	1.0 [c]	1.0 [c]	55.2 [m]
beta-BHC	3.9 [a]	0.216 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
4,4'-DDD	6.2 [a]	0.0102 [e]	0.25 [j,k]	1 [j,n]	11 [j,n]
4,4'-DDE	7.0 [a]	0.00348 [e]	0.25 [j,k]	1 [j,n]	11 [j,n]
4,4'-DDT	6.19 [a]	0.0102 [e]	0.25 [j,k]	1 [j,n]	11 [j,n]
delta-BHC	4.1 [a]	0.165 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Dieldrin	3.5 [a]	0.367 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Endosulfan II	3.55 [a,o]	0.344 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Endosulfan-Sulfate	3.55 [a,o]	0.344 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Endrin	5.6 [p]	0.0224 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Endrin-Aldehyde	5.6 [p,q]	0.0224 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Endrin-Ketone	5.6 [p,q]	0.0224 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]
Alpha-chlordane	3.32 [a,r]	0.467 [e]	0.25 [j,k]	1.0 [c]	1.0 [c]

Table V - 8

LOG K_{ow}s, BAFs, AND PUFs USED TO CALCULATE PLANT, EARTHWORM, SMALL MAMMAL, AND BIRD TISSUE CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Log K_{ow}	Plant Uptake Factors (PUFs) (Reproductive)	Earthworm Bioaccumulation Factors (BAFs)	Small Mammal Bioaccumulation Factors (BAFs)	Bird Bioaccumulation Factors (BAFs)
Gamma-chlordane	3.32 [a, r]	0.467 [e]	0.25 [j, k]	1.0 [c]	1.0 [c]
gamma-BHC	3.9 [a]	0.216 [e]	0.25 [j, k]	1.0 [c]	1.0 [c]
Heptachlor	4.4 [a]	0.0278 [e]	0.25 [j, k]	1.0 [c]	4.5 [t]
Heptachlor-Epoxide	4.4 [a, s]	0.0293 [e]	0.25 [j, k]	1.0 [c]	4.5 [t]
Methoxyclor	5.08 [u]	0.0448 [e]	0.25 [j, k]	1.0 [c]	1.0 [c]
Dioxins/Furans					
2,3,7,8-TCDD	6.15 [v]	0.0108 [e]	1.0 [c]	24.54 [w]	1.0 [c]
Inorganics					
Aluminum	NA	0.00065 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Antimony	NA	0.03 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Arsenic	NA	0.05 [y] **0.006** [x]	0.91 [g] **0.06** [z]	1.0 [c]	1.0 [c]
Barium	NA	0.015 [x]	0.36 [g]	1.0 [c]	1.0 [c]
Beryllium	NA	0.0015 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Cadmium	NA	**0.06** [aa] 0.47 [ac] 0.15 [x]	4.6 [g] 18 [aa] 12.1 [z] 66.7 [ad] 12.8 [ac] **21** [h]	0.45 [aa]	0.03 [aa, ab]
Chromium	NA	0.0045 [x]	0.49 [g] **0.27** [z]	1.0 [c]	1.0 [c]
Cobalt	NA	0.007 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Copper	NA	**0.27** [aa] 0.75 [ac] 0.25 [x]	0.52 [g] 2.6 [aa] **0.36** [z] 1.1 [ad] 0.91 [ac]	0.32 [aa]	0.06 [aa, ab]
Cyanide	NA	1.0 [c]	1.0 [c]	1.0 [c]	1.0 [c]
Iron	NA	0.001 [x]	0.38 [g]	1.0 [c]	1.0 [c]
Lead	NA	**0.007** [aa] 0.05 [y] 0.13 [ac]	0.45 [g] 0.82 [aa] 0.18 [z]	0.1 [aa]	0.24 [aa, ab]

Table V - 8

LOG K_{ow}s, BAFs, AND PUFs USED TO CALCULATE PLANT, EARTHWORM, SMALL MAMMAL, AND BIRD TISSUE CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Log K_{ow}	Plant Uptake Factors (PUFs) (Reproductive)	Earthworm Bioaccumulation Factors (BAFs)	Small Mammal Bioaccumulation Factors (BAFs)	Bird Bioaccumulation Factors (BAFs)
Lead		0.009 [x]	0.88 [ad]		
			0.2 [ac]		
			0.66 [h]		
Manganese	NA	0.05 [x]	0.4 [g]	1.0 [c]	1.0 [c]
Mercury	NA	**0.31** [y]	0.96 [g]	1.0 [c]	1.0 [c]
		0.2 [x]			
Nickel	NA	0.06 [x]	**0.41** [g]	1.0 [c]	1.0 [c]
			1.1 [ad]		
Selenium	NA	0.025 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Silver	NA	0.1 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Thallium	NA	0.0004 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Vanadium	NA	0.003 [x]	1.0 [c]	1.0 [c]	1.0 [c]
Zinc	NA	**0.033** [aa]	1.8 [g]	0.25 [aa]	0.013 [aa, ab]
		0.89 [ac]	0.67 [aa]		
		0.9 [x]	**6.9** [z]		
			5.0 [ad]		
			1.88 [ac]		

Highlighted numbers represent those chosen for the exposure model.

NE - Not evaluated because log K_{ow} is inappropriate for the plant uptake model.

NA - Not applicable.

a. EPA 1986b.

b. No plant uptake factor was calculated because the Kow value is below the minimum value required for the model in Travis and Arms (1988).

c. 100% bioaccumulation was assumed in the absence of literature data.

d. Verschueren 1983.

e. Modeled plant uptake factors based on the transfer equation in Travis and Arms 1988.

f. Gile et al. 1982.

g. Beyer et al. 1993.

h. Beyer 1990.

i. Verschueren 1983.

j. Menzie et al. 1992.

k. A mean of 12% total organic carbon for soil and 2% lipid content for the earthworm were assumed .

l. ATSDR 1993.

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Table V - 8

LOG K_{ow}s, BAFs, AND PUFs USED TO CALCULATE PLANT, EARTHWORM, SMALL MAMMAL, AND BIRD TISSUE CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Log K_{ow}	Plant Uptake Factors (PUFs) (Reproductive)	Earthworm Bioaccumulation Factors (BAFs)	Small Mammal Bioaccumulation Factors (BAFs)	Bird Bioaccumulation Factors (BAFs)

m. EPA 1985 (values calculated by dividing tissue concentration by food concentration).
n. Bioconcentration factor from food (dry weight) to whole body (wet weight).
o. Kow for endosulfan used for endosulfan II.
p. Verschueren 1983.
q. Kow for endrin used for endrin aldehyde and endrin ketone.
r. Kow for chlordane used for alpha and gamma chlordane.
s. Kow for heptachlor used for heptachlor epoxide.
t. EPA 1985 (values calculated by dividing tissue concentration by food concentration)
u. ATSDR 1992.
v. ATSDR 1989.
w. EPA 1985 (values calculated by dividing tissue concentration by food concentration).
x. Plant uptake factors for inorganics obtained from values in Baes et al. 1984.
y. Elfving et al. 1978.
z. Beyer et al. 1987 (values utilized were from industrial sites A-G).
aa. Beyer et al. 1985.
ab. Based on the maximum of a range of concentrations listed for the robin.
ac. Ma 1987.
ad. Beyer et al. 1982 (values utilized were from the control site in the experiment).
ae. ATSDR 1992.

Source: Ecology and Environment, Inc. 1994

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Table V - 9

FUNCTIONAL GROUPS THAT POTENTIALLY INHABIT OR UTILIZE THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Functional Group	Common Name	Trophic Level
Birds (Class Aves, Order Passeriformes)		
1	American Robin[a]	4
	American Crow	3
	House Wren	2
	Song Sparrow	1
	Great-crested Flycatcher	2
Birds (Class Aves, Order Apodiformes)		
2	Chimney Swift	2
	Ruby-throated Hummingbird	1
Raptors (Class Aves, Order Falcinoforms)		
3	American Kestrel[a]	2/3
	Northern Harrier	3
	Sharp-shinned Hawk	3
	Red-tailed Hawk	3
Small Mammals (Class Mammalia, Order Insectivora)		
4	*Short-tailed Shrew*[a]	4
	Eastern Mole	2/3
	Big brown Bat	2
Small Mammals (Class Mammalia, Order Marsupialia)		
5	Virginia Opossum	4
Small Mammals (Class Mammalia, Order Rodentia)		
6	Eastern Harvest Mouse	1
	White-footed Mouse	4
	Black Rat	1
	Hipsid Cotton Rat	1
	Gray Squirrel	4
Small Mammals (Class Mammalia, Order Lagomorpha)		
7	Eastern Cottontail	1
	Swamp Rabbit	1

[a] Selected as measurement endpoint species.

Key:

Trophic Level codes:

1 = Herbivore
2 = Insectivore
3 = Carnivore
4 = Omnivore

Source: Ecology and Environment, Inc., 1994.

Table V - 10

ASSESSMENT ENDPOINT SPECIES FOR THE UNDEVELOPED LANDFILL
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Assessment Endpoint Species Category	Ecological Relevance	Regulatory or Social Significance	Susceptibility to Stressors	Measurability or Predictability
Native vegetation	Provide nesting, food, and cover for wildlife.	Potential habitat for migratory birds that are listed by the state or federal government.	Roots may penetrate to subsurface contamination. Stressors in surface soil could also be mobilized and absorbed. Some stressors are known to be phytotoxic.	Levels of stressors in soils and plant tissues can be measured or predicted and related to published toxicity benchmarks for crops or native plants.
Soil macroinvertebrates	Base of the food chain for small mammals and omnivorous birds.	Significant as a food item for other species higher on the trophic level.	Exposure likely due to continuous exposure of soil stressors.	Levels of stressors in soil macroinvertebrates can be measured or predicted and related to published toxicity benchmarks for soil macroinvertebrates.
Small mammals	Base of the food chain for raptors and carnivores.	Significant as a food item for other species of concern.	Exposure likely due to burrowing habits and occurrence in fenced and disturbed areas.	Dose rates can be estimated using published or literature-derived BAFs and related to published toxicity benchmarks. Toxicological information is relatively good for rodents due to widespread use as surrogates for testing effects of stressors on humans.
Passerines	Base of the food chain for raptors and carnivores.	Significant as a food item for other species of concern.	Exposure likely due to feeding habits.	Dose rates can be estimated using published or literature-derived BAFs and related to published toxicity benchmarks.
Raptors	Top predators in terrestrial food chain.	Of recreational and aesthetic importance. Although no state or federally listed species are found in the vicinity of the site, the potential exists for migratory species to utilize the site.	Exposure possible through the consumption of contaminated food items.	Dose rates can be estimated from small mammal and bird tissue residues estimated from bioaccumulation data. Limited toxicological data are available for birds of prey.

Source: Ecology and Environment, Inc., 1994.

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Table V - 11

MAXIMUM EXPOSURE POINT CONCENTRATIONS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)
Volatile Organics	
Acetone	2.10E-02
Chloroform	3.00E-03
Ethylbenzene	4.60E-01
Tetrachloroethene	2.10E-02
Toluene	2.00E-03
Xylene	2.90E+00
Semivolatile Organics	
Acenaphthene	1.40E-01
Acenaphthylene	7.40E-01
Anthracene	9.30E-01
Benzo(a)anthracene	7.80E+00
Benzo(a)pyrene	7.00E+00
Benzo(b)fluoranthene	9.70E+00
Benzo(g,h,i)perylene	3.20E+00
Benzo(k)fluoranthene	9.80E+00
Carbazole	1.50E-01
Chrysene	7.10E+00
Dibenz(a,h)anthracene	1.00E+00
Dibenzofuran	1.00E-01
Diethylphthalate	3.90E-02
Di-N-butylphthalate	1.80E-01
Di-N-octylphthalate	7.30E-02
Fluoranthene	1.00E+01
Fluorene	2.50E-01
Indeno(1,2,3-cd)pyrene	3.10E+00
4-Methylphenol	1.00E-01
2-Methylnaphthalene	7.80E-02
Naphthalene	1.20E-01
Phenanthrene	2.80E+00
Pyrene	1.50E+01
Pesticides/PCBs	
DDD	3.12E-02
DDE	2.25E-02
DDT	2.59E-02
Endosulfan II	1.71E-02
Endrin	9.24E-03
Alpha-chlordane	1.48E-02
Gamma-chlordane	1.44E-02
Inorganic Analytes	
Aluminum	1.46E+04
Antimony	1.59E+01
Arsenic	2.72E+01
Barium	1.04E+03
Beryllium	1.70E+00
Cadmium	4.80E+00

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Table V - 11

MAXIMUM EXPOSURE POINT CONCENTRATIONS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)
Chromium(III)	9.07E+01
Cobalt	1.72E+01
Copper	2.52E+03
Iron	1.31E+05
Lead	2.22E+03
Manganese	9.44E+02
Mercury	3.40E+00
Nickel	8.65E+01
Silver	5.80E+00
Thallium	4.80E-01
Vanadium	3.08E+01
Zinc	3.31E+03

Table V - 12

EXPOSURE PARAMETERS FOR MEASUREMENT SPECIES
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Receptor	Percentage of Diet						Home Range (acres)	Site Use Factor	Exposure Duration	Ingestion Rate (kg/day)	Body Weight (kg)
	Plants	Small Mammals	Birds	Earthworms	Insects	Soil [a]					
Short-tailed Shrew	-	-	-	100	-	10.4	1.5	1	1	0.004	0.0225
American Robin	50	-	-	50	-	10.4	2	1	1	0.036	0.093
American Kestrel	-	47	52	-	1	-	180	0.22	1	0.015	0.159

[a] Soil ingestion percentage represents a percentage of the dietary intake of the species of concern.

Source: Ecology and Environment, Inc., 1994.

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Table V - 13

SHORT-TAILED SHREW MAXIMUM EXPOSURE DOSES (mg/kg-day), PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion	Maximum Earthworm Ingestion	Maximum Oral Total Dose
Volatile Organics			
Acetone	7.28E-04	7.00E-03	7.73E-03
Chloroform	1.04E-04	1.00E-03	1.10E-03
Ethylbenzene	1.59E-02	1.53E-01	1.69E-01
Tetrachloroethene	7.28E-04	7.00E-03	7.73E-03
Toluene	6.93E-05	6.67E-04	7.36E-04
Xylene	1.01E-01	9.67E-01	1.07E+00
Semivolatile Organics			
Acenaphthene	4.85E-03	1.40E-02	1.89E-02
Acenaphthylene	2.57E-02	5.43E-02	7.99E-02
Anthracene	3.22E-02	1.55E-02	4.77E-02
Benzo(a)anthracene	2.70E-01	2.60E-01	5.30E-01
Benzo(a)pyrene	2.43E-01	7.00E-01	9.43E-01
Benzo(b)fluoranthene	3.36E-01	9.70E-01	1.31E+00
Benzo(g,h,i)perylene	1.11E-01	2.13E-01	3.24E-01
Benzo(k)fluoranthene	3.40E-01	9.80E-01	1.32E+00
Carbazole	5.20E-03	5.00E-02	5.52E-02
Chrysene	2.46E-01	4.73E-01	7.19E-01
Dibenz(a,h)anthracene	3.47E-02	1.63E-01	1.98E-01
Dibenzofuran	3.47E-03	3.33E-02	3.68E-02
Diethylphthalate	1.35E-03	1.30E-02	1.44E-02
Di-N-butylphthalate	6.24E-03	6.00E-02	6.62E-02
Di-N-octylphthalate	2.53E-03	2.43E-02	2.69E-02
Fluoranthene	3.47E-01	2.67E-01	6.13E-01
Fluorene	8.67E-03	1.67E-02	2.53E-02
Indeno(1,2,3-cd)pyrene	1.07E-01	4.13E-01	5.21E-01
4-Methylphenol	3.47E-03	3.33E-02	3.68E-02
2-Methylnaphthalene	2.70E-03	5.20E-03	7.90E-03
Naphthalene	4.16E-03	8.40E-03	1.26E-02
Phenanthrene	9.71E-02	9.33E-02	1.90E-01
Pyrene	5.20E-01	4.50E-01	9.70E-01
Pesticides/PCBs			
DDD	1.08E-03	2.08E-03	3.16E-03
DDE	7.80E-04	1.88E-03	2.66E-03
DDT	8.98E-04	2.16E-03	3.06E-03
Endosulfan II	5.93E-04	1.43E-03	2.02E-03
Endrin	3.20E-04	7.70E-04	1.09E-03
Alpha-chlordane	5.13E-04	1.23E-03	1.75E-03
Gamma-chlordane	4.99E-04	1.20E-03	1.70E-03
Inorganic Analytes			
Aluminum	5.06E+02	4.86E+03	5.37E+03
Antimony	5.51E-01	5.30E+00	5.85E+00
Arsenic	9.43E-01	5.44E-01	1.49E+00

Table V - 13

SHORT-TAILED SHREW MAXIMUM EXPOSURE DOSES (mg/kg-day), PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion	Maximum Earthworm Ingestion	Maximum Oral Total Dose
Barium	3.60E+01	1.25E+02	1.61E+02
Beryllium	5.89E-02	5.67E-01	6.26E-01
Cadmium	1.66E-01	3.36E+01	3.38E+01
Chromium(III)	3.14E+00	8.16E+00	1.13E+01
Cobalt	5.96E-01	5.73E+00	6.33E+00
Copper	8.74E+01	3.03E+02	3.90E+02
Iron	4.54E+03	1.66E+04	2.11E+04
Lead	7.71E+01	4.89E+02	5.66E+02
Manganese	3.27E+01	1.26E+02	1.59E+02
Mercury	1.18E-01	1.09E+00	1.21E+00
Nickel	3.00E+00	1.18E+01	1.48E+01
Silver	2.01E-01	1.93E+00	2.13E+00
Thallium	1.66E-02	1.60E-01	1.77E-01
Vanadium	1.07E+00	1.03E+01	1.13E+01
Zinc	1.15E+02	7.62E+03	7.73E+03

Table V - 14

AMERICAN ROBIN MAXIMUM EXPOSURE DOSES (mg/kg-day), PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion	Maximum Fruit Ingestion	Maximum Earthworm Ingestion	Maximum Oral Total Dose
Volatile Organics				
Acetone	1.12E-03	NE	5.40E-03	6.52E-03
Chloroform	1.60E-04	2.17E-03	7.71E-04	3.10E-03
Ethylbenzene	2.46E-02	6.92E-02	1.18E-01	2.12E-01
Tetrachloroethene	1.12E-03	6.57E-03	5.40E-03	1.31E-02
Toluene	1.07E-04	5.26E-04	5.14E-04	1.15E-03
Xylene	1.55E-01	3.77E-01	7.46E-01	1.28E+00
Semivolatile Organics				
Acenaphthene	7.49E-03	8.28E-02	1.08E-02	1.01E-01
Acenaphthylene	3.96E-02	5.36E-02	4.19E-02	1.35E-01
Anthracene	4.97E-02	2.48E-02	1.20E-02	8.65E-02
Benzo(a)anthracene	4.17E-01	4.50E-02	2.01E-01	6.63E-01
Benzo(a)pyrene	3.74E-01	2.19E-02	5.40E-01	9.36E-01
Benzo(b)fluoranthene	5.19E-01	3.04E-02	7.48E-01	1.30E+00
Benzo(g,h,i)perylene	1.71E-01	5.50E-03	1.65E-01	3.41E-01
Benzo(k)fluoranthene	5.24E-01	3.07E-02	7.56E-01	1.31E+00
Carbazole	8.02E-03	1.87E-02	3.86E-02	6.53E-02
Chrysene	3.80E-01	4.04E-02	3.65E-01	7.85E-01
Dibenz(a,h)anthracene	5.35E-02	1.17E-03	1.26E-01	1.81E-01
Dibenzofuran	5.35E-03	4.14E-03	2.57E-02	3.52E-02
Diethylphthalate	2.09E-03	1.39E-02	1.00E-02	2.61E-02
Di-N-butylphthalate	9.63E-03	1.04E-03	4.63E-02	5.70E-02
Di-N-octylphthalate	3.90E-03	1.88E-02	1.88E-02	4.14E-02
Fluoranthene	5.35E-01	1.47E-01	2.06E-01	8.87E-01
Fluorene	1.34E-02	9.30E-03	1.29E-02	3.55E-02
Indeno(1,2,3-cd)pyrene	1.66E-01	5.40E-03	3.19E-01	4.90E-01
4-Methylphenol	5.35E-03	7.24E-02	2.57E-02	1.03E-01
2-Methylnaphthalene	4.17E-03	3.31E-03	4.01E-03	1.15E-02
Naphthalene	6.42E-03	1.50E-02	6.48E-03	2.79E-02
Phenanthrene	1.50E-01	1.06E+01	7.20E-02	1.08E+01
Pyrene	8.02E-01	2.26E-01	3.47E-01	1.38E+00
Pesticides/PCBs				
DDD	1.67E-03	8.10E-05	1.60E-03	3.35E-03
DDE	1.20E-03	2.02E-05	1.45E-03	2.67E-03
DDT	1.39E-03	6.82E-05	1.67E-03	3.12E-03
Endosulfan II	9.15E-04	1.51E-03	1.10E-03	3.52E-03
Endrin	4.94E-04	5.33E-05	5.94E-04	1.14E-03
Alpha-chlordane	7.92E-04	1.78E-03	9.51E-04	3.52E-03
Gamma-chlordane	7.70E-04	1.73E-03	9.26E-04	3.42E-03
Inorganic Analytes				
Aluminum	7.80E+02	2.44E+00	3.75E+03	4.53E+03
Antimony	8.50E-01	1.23E-01	4.09E+00	5.06E+00
Arsenic	1.45E+00	4.20E-02	4.20E-01	1.92E+00

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Table V - 14

AMERICAN ROBIN MAXIMUM EXPOSURE DOSES (mg/kg-day), PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion	Maximum Fruit Ingestion	Maximum Earthworm Ingestion	Maximum Oral Total Dose
Barium	5.55E+01	4.00E+00	9.61E+01	1.56E+02
Beryllium	9.09E-02	6.56E-04	4.37E-01	5.29E-01
Cadmium	2.57E-01	7.41E-02	2.59E+01	2.63E+01
Chromium(III)	4.85E+00	1.05E-01	6.30E+00	1.13E+01
Cobalt	9.20E-01	3.10E-02	4.42E+00	5.37E+00
Copper	1.35E+02	1.75E+02	2.33E+02	5.43E+02
Iron	7.00E+03	3.37E+01	1.28E+04	1.98E+04
Lead	1.19E+02	4.00E+00	3.77E+02	5.00E+02
Manganese	5.05E+01	1.21E+01	9.71E+01	1.60E+02
Mercury	1.82E-01	2.71E-01	8.39E-01	1.29E+00
Nickel	4.63E+00	1.33E+00	9.12E+00	1.51E+01
Silver	3.10E-01	1.49E-01	1.49E+00	1.95E+00
Thallium	2.57E-02	4.94E-05	1.23E-01	1.49E-01
Vanadium	1.65E+00	2.38E-02	7.92E+00	9.59E+00
Zinc	1.77E+02	2.81E+01	5.88E+03	6.08E+03

Table V - 15

AMERICAN KESTREL MAXIMUM EXPOSURE DOSES (mg/kg-day), PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Shrew Ingestion	Maximum Robin Ingestion	Maximum Insect Ingestion	Maximum Oral Total Dose
Volatile Organics				
Acetone	2.61E-04	2.88E-04	5.54E-06	5.54E-04
Chloroform	3.72E-05	4.12E-05	7.92E-07	7.92E-05
Ethylbenzene	5.71E-03	6.31E-03	1.21E-04	1.21E-02
Tetrachloroethene	2.61E-04	2.88E-04	5.54E-06	5.54E-04
Toluene	2.48E-05	2.75E-05	5.28E-07	5.28E-05
Xylene	3.60E-02	3.98E-02	7.66E-04	7.66E-02
Semivolatile Organics				
Acenaphthene	5.39E-02	1.92E-03	1.11E-05	5.58E-02
Acenaphthylene	9.18E-03	1.02E-02	4.30E-05	1.94E-02
Anthracene	1.15E-02	1.28E-02	1.23E-05	2.43E-02
Benzo(a)anthracene	9.68E-02	1.07E-01	2.06E-04	2.04E-01
Benzo(a)pyrene	8.69E-02	9.61E-02	5.54E-04	1.84E-01
Benzo(b)fluoranthene	1.20E-01	1.33E-01	7.68E-04	2.54E-01
Benzo(g,h,i)perylene	3.97E-02	4.39E-02	1.69E-04	8.38E-02
Benzo(k)fluoranthene	1.22E-01	1.35E-01	7.76E-04	2.57E-01
Carbazole	1.86E-03	2.06E-03	3.96E-05	3.96E-03
Chrysene	8.81E-02	9.75E-02	3.75E-04	1.86E-01
Dibenz(a,h)anthracene	1.24E-02	1.37E-02	1.29E-04	2.63E-02
Dibenzofuran	1.24E-03	1.37E-03	2.64E-05	2.64E-03
Diethylphthalate	4.84E-04	5.35E-04	1.03E-05	1.03E-03
Di-N-butylphthalate	2.23E-03	2.47E-03	4.75E-05	4.75E-03
Di-N-octylphthalate	9.06E-04	1.00E-03	1.93E-05	1.93E-03
Fluoranthene	1.24E-01	1.37E-01	2.11E-04	2.62E-01
Fluorene	3.10E-03	3.43E-03	1.32E-05	6.55E-03
Indeno(1,2,3-cd)pyrene	3.85E-02	4.26E-02	3.27E-04	8.13E-02
4-Methylphenol	1.24E-03	1.37E-03	2.64E-05	2.64E-03
2-Methylnaphthalene	9.68E-04	1.07E-03	4.12E-06	2.04E-03
Naphthalene	1.49E-03	1.65E-03	6.65E-06	3.14E-03
Phenanthrene	4.17E-01	3.84E-02	7.39E-05	4.55E-01
Pyrene	1.86E-01	2.06E-01	3.56E-04	3.92E-01
Pesticides/PCBs				
DDD	3.87E-04	4.71E-03	1.65E-06	5.10E-03
DDE	2.79E-04	3.40E-03	1.49E-06	3.68E-03
DDT	3.21E-04	3.91E-03	1.71E-06	4.23E-03
Endosulfan II	2.12E-04	2.35E-04	1.13E-06	4.48E-04
Endrin	1.15E-04	1.27E-04	6.10E-07	2.42E-04
Alpha-chlordane	1.84E-04	2.03E-04	9.77E-07	3.88E-04
Gamma-chlordane	1.79E-04	1.98E-04	9.50E-07	3.77E-04
Inorganic Analytes				
Aluminum	1.81E+02	2.00E+02	3.85E+00	3.85E+02
Antimony	1.97E-01	2.18E-01	4.20E-03	4.20E-01
Arsenic	3.37E-01	3.73E-01	4.31E-04	7.11E-01

Table V - 15

AMERICAN KESTREL MAXIMUM EXPOSURE DOSES (mg/kg-day), PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Shrew Ingestion	Maximum Robin Ingestion	Maximum Insect Ingestion	Maximum Oral Total Dose
Barium	1.29E+01	1.42E+01	9.87E-02	2.72E+01
Beryllium	2.11E-02	2.33E-02	4.49E-04	4.49E-02
Cadmium	2.68E-02	1.98E-03	2.66E-02	5.54E-02
Chromium(III)	1.13E+00	1.25E+00	6.47E-03	2.38E+00
Cobalt	2.13E-01	2.36E-01	4.54E-03	4.54E-01
Copper	1.00E+01	2.08E+00	2.40E-01	1.23E+01
Iron	1.62E+03	1.80E+03	1.31E+01	3.44E+03
Lead	2.76E+00	7.32E+00	3.87E-01	1.05E+01
Manganese	1.17E+01	1.30E+01	9.97E-02	2.48E+01
Mercury	4.22E-02	4.67E-02	8.62E-04	8.97E-02
Nickel	1.07E+00	1.19E+00	9.36E-03	2.27E+00
Silver	7.20E-02	7.96E-02	1.53E-03	1.53E-01
Thallium	5.96E-03	6.59E-03	1.27E-04	1.27E-02
Vanadium	3.82E-01	4.23E-01	8.13E-03	8.13E-01
Zinc	1.03E+01	5.91E-01	6.03E+00	1.69E+01

Table V - 16

ESTIMATED PLANT TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Plant Uptake Factors (Fruit)	Maximum Plant Tissue Concentrations (mg/kg dry weight)
Volatile Organics			
Acetone	2.10E-02	NE	NE
Chloroform	3.00E-03	2.81E+00	8.44E-03
Ethylbenzene	4.60E-01	5.85E-01	2.69E-01
Tetrachloroethene	2.10E-02	1.22E+00	2.56E-02
Toluene	2.00E-03	1.02E+00	2.05E-03
Xylene	2.90E+00	5.05E-01	1.47E+00
Semivolatile Organics			
Acenaphthene	1.40E-01	2.30E+00	3.22E-01
Acenaphthylene	7.40E-01	2.81E-01	2.08E-01
Anthracene	9.30E-01	1.04E-01	9.65E-02
Benzo(a)anthracene	7.80E+00	2.24E-02	1.75E-01
Benzo(a)pyrene	7.00E+00	1.22E-02	8.52E-02
Benzo(b)fluoranthene	9.70E+00	1.22E-02	1.18E-01
Benzo(g,h,i)perylene	3.20E+00	6.69E-03	2.14E-02
Benzo(k)fluoranthene	9.80E+00	1.22E-02	1.19E-01
Carbazole	1.50E-01	4.86E-01	7.29E-02
Chrysene	7.10E+00	2.22E-02	1.57E-01
Dibenz(a,h)anthracene	1.00E+00	4.55E-03	4.55E-03
Dibenzofuran	1.00E-01	1.61E-01	1.61E-02
Diethylphthalate	3.90E-02	1.39E+00	5.42E-02
Di-N-butylphthalate	1.80E-01	2.24E-02	4.04E-03
Di-N-octylphthalate	7.30E-02	1.00E+00	7.30E-02
Fluoranthene	1.00E+01	5.70E-02	5.70E-01
Fluorene	2.50E-01	1.45E-01	3.62E-02
Indeno(1,2,3-cd)pyrene	3.10E+00	6.78E-03	2.10E-02
4-Methylphenol	1.00E-01	2.81E+00	2.81E-01
2-Methylnaphthalene	7.80E-02	1.65E-01	1.29E-02
Naphthalene	1.20E-01	4.86E-01	5.83E-02
Phenanthrene	2.80E+00	1.47E+01	4.12E+01
Pyrene	1.50E+01	5.85E-02	8.78E-01
Pesticides/PCBs			
DDD	3.12E-02	1.01E-02	3.15E-04
DDE	2.25E-02	3.48E-03	7.84E-05
DDT	2.59E-02	1.02E-02	2.65E-04
Endosulfan II	1.71E-02	3.44E-01	5.88E-03
Endrin	9.24E-03	2.24E-02	2.07E-04
Alpha-chlordane	1.48E-02	4.67E-01	6.91E-03
Gamma-chlordane	1.44E-02	4.67E-01	6.72E-03
Inorganic Analytes			
Aluminum	1.46E+04	6.50E-04	9.48E+00
Antimony	1.59E+01	3.00E-02	4.77E-01
Arsenic	2.72E+01	6.00E-03	1.63E-01

Table V - 16

**ESTIMATED PLANT TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Plant Uptake Factors (Fruit)	Maximum Plant Tissue Concentrations (mg/kg dry weight)
Barium	1.04E+03	1.50E-02	1.56E+01
Beryllium	1.70E+00	1.50E-03	2.55E-03
Cadmium	4.80E+00	6.00E-02	2.88E-01
Chromium(III)	9.07E+01	4.50E-03	4.08E-01
Cobalt	1.72E+01	7.00E-03	1.20E-01
Copper	2.52E+03	2.70E-01	6.81E+02
Iron	1.31E+05	1.00E-03	1.31E+02
Lead	2.22E+03	7.00E-03	1.56E+01
Manganese	9.44E+02	5.00E-02	4.72E+01
Mercury	3.40E+00	3.10E-01	1.05E+00
Nickel	8.65E+01	6.00E-02	5.19E+00
Silver	5.80E+00	1.00E-01	5.80E-01
Thallium	4.80E-01	4.00E-04	1.92E-04
Vanadium	3.08E+01	3.00E-03	9.24E-02
Zinc	3.31E+03	3.30E-02	1.09E+02

NE - Not evaluated

Table V - 17

ESTIMATED EARTHWORM TISSUE CONCENTRATIONS CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Earthworm Bioaccumulation Factors [a]	Earthworm Maximum Tissue Concentrations (mg/kg)
Volatile Organics			
Acetone	2.10E-02	**1.00E+00**	2.10E-02
Chloroform	3.00E-03	**1.00E+00**	3.00E-03
Ethylbenzene	4.60E-01	**1.00E+00**	4.60E-01
Tetrachloroethene	2.10E-02	**1.00E+00**	2.10E-02
Toluene	2.00E-03	**1.00E+00**	2.00E-03
Xylene	2.90E+00	**1.00E+00**	2.90E+00
Semivolatile Organics			
Acenaphthene	1.40E-01	3.00E-01	4.20E-02
Acenaphthylene	7.40E-01	2.20E-01	1.63E-01
Anthracene	9.30E-01	5.00E-02	4.65E-02
Benzo(a)anthracene	7.80E+00	1.00E-01	7.80E-01
Benzo(a)pyrene	7.00E+00	3.00E-01	2.10E+00
Benzo(b)fluoranthene	9.70E+00	3.00E-01	2.91E+00
Benzo(g,h,i)perylene	3.20E+00	2.00E-01	6.40E-01
Benzo(k)fluoranthene	9.80E+00	3.00E-01	2.94E+00
Carbazole	1.50E-01	**1.00E+00**	1.50E-01
Chrysene	7.10E+00	2.00E-01	1.42E+00
Dibenz(a,h)anthracene	1.00E+00	4.90E-01	4.90E-01
Dibenzofuran	1.00E-01	**1.00E+00**	1.00E-01
Diethylphthalate	3.90E-02	**1.00E+00**	3.90E-02
Di-N-butylphthalate	1.80E-01	**1.00E+00**	1.80E-01
Di-N-octylphthalate	7.30E-02	**1.00E+00**	7.30E-02
Fluoranthene	1.00E+01	8.00E-02	8.00E-01
Fluorene	2.50E-01	2.00E-01	5.00E-02
Indeno(1,2,3-cd)pyrene	3.10E+00	4.00E-01	1.24E+00
4-Methylphenol	1.00E-01	**1.00E+00**	1.00E-01
2-Methylnaphthalene	7.80E-02	2.00E-01	1.56E-02
Naphthalene	1.20E-01	2.10E-01	2.52E-02
Phenanthrene	2.80E+00	1.00E-01	2.80E-01
Pyrene	1.50E+01	9.00E-02	1.35E+00
Pesticides/PCBs			
DDD	3.12E-02	2.00E-01	6.24E-03
DDE	2.25E-02	2.50E-01	5.63E-03
DDT	2.59E-02	2.50E-01	6.48E-03
Endosulfan II	1.71E-02	2.50E-01	4.28E-03
Endrin	9.24E-03	2.50E-01	2.31E-03
Alpha-chlordane	1.48E-02	2.50E-01	3.70E-03

Table V - 17

ESTIMATED EARTHWORM TISSUE CONCENTRATIONS CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Earthworm Bioaccumulation Factors [a]	Earthworm Maximum Tissue Concentrations (mg/kg)
Gamma-chlordane	1.44E-02	2.50E-01	3.60E-03
Inorganic Analytes			
Aluminum	1.46E+04	**1.00E+00**	1.46E+04
Antimony	1.59E+01	**1.00E+00**	1.59E+01
Arsenic	2.72E+01	6.00E-02	1.63E+00
Barium	1.04E+03	3.60E-01	3.74E+02
Beryllium	1.70E+00	**1.00E+00**	1.70E+00
Cadmium	4.80E+00	2.10E+01	1.01E+02
Chromium(III)	9.07E+01	2.70E-01	2.45E+01
Cobalt	1.72E+01	**1.00E+00**	1.72E+01
Copper	2.52E+03	3.60E-01	9.08E+02
Iron	1.31E+05	3.80E-01	4.98E+04
Lead	2.22E+03	6.60E-01	1.47E+03
Manganese	9.44E+02	4.00E-01	3.78E+02
Mercury	3.40E+00	9.60E-01	3.26E+00
Nickel	8.65E+01	4.10E-01	3.55E+01
Silver	5.80E+00	**1.00E+00**	5.80E+00
Thallium	4.80E-01	**1.00E+00**	4.80E-01
Vanadium	3.08E+01	**1.00E+00**	3.08E+01
Zinc	3.31E+03	6.90E+00	2.29E+04

a - A bioaccumulation factor of 1 (100%) was assumed for earthworm tissue in the absence of literature data (EPA 1994a).

Bold, shaded numbers represent the assumption of 100% bioaccumulation for earthworm tissue in the absence of literature data.

Table V - 18

ESTIMATED SHORT-TAILED SHREW TISSUE CONCENTRATIONS CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Small Mammal Bioaccumulation Factors [a]	Small Mammal Maximum Tissue Concentrations (mg/kg)
Volatile Organics			
Acetone	2.10E-02	**1.00E+00**	2.10E-02
Chloroform	3.00E-03	**1.00E+00**	3.00E-03
Ethylbenzene	4.60E-01	**1.00E+00**	4.60E-01
Tetrachloroethene	2.10E-02	**1.00E+00**	2.10E-02
Toluene	2.00E-03	**1.00E+00**	2.00E-03
Xylene	2.90E+00	**1.00E+00**	2.90E+00
Semivolatile Organics			
Acenaphthene	1.40E-01	3.10E+01	4.20E-02
Acenaphthylene	7.40E-01	**1.00E+00**	1.63E-01
Anthracene	9.30E-01	**1.00E+00**	4.65E-02
Benzo(a)anthracene	7.80E+00	**1.00E+00**	7.80E-01
Benzo(a)pyrene	7.00E+00	**1.00E+00**	2.10E+00
Benzo(b)fluoranthene	9.70E+00	**1.00E+00**	2.91E+00
Benzo(g,h,i)perylene	3.20E+00	**1.00E+00**	6.40E-01
Benzo(k)fluoranthene	9.80E+00	**1.00E+00**	2.94E+00
Carbazole	1.50E-01	**1.00E+00**	1.50E-01
Chrysene	7.10E+00	**1.00E+00**	1.42E+00
Dibenz(a,h)anthracene	1.00E+00	**1.00E+00**	4.90E-01
Dibenzofuran	1.00E-01	**1.00E+00**	1.00E-01
Diethylphthalate	3.90E-02	**1.00E+00**	3.90E-02
Di-N-butylphthalate	1.80E-01	**1.00E+00**	1.80E-01
Di-N-octylphthalate	7.30E-02	**1.00E+00**	7.30E-02
Fluoranthene	1.00E+01	**1.00E+00**	8.00E-01
Fluorene	2.50E-01	**1.00E+00**	5.00E-02
Indeno(1,2,3-cd)pyrene	3.10E+00	**1.00E+00**	1.24E+00
4-Methylphenol	1.00E-01	**1.00E+00**	1.00E-01
2-Methylnaphthalene	7.80E-02	**1.00E+00**	1.56E-02
Naphthalene	1.20E-01	**1.00E+00**	2.52E-02
Phenanthrene	2.80E+00	1.20E+01	2.80E-01
Pyrene	1.50E+01	**1.00E+00**	1.35E+00
Pesticides/PCBs			
DDD	3.12E-02	1.00E+00	6.24E-03
DDE	2.25E-02	1.00E+00	5.63E-03
DDT	2.59E-02	1.00E+00	6.48E-03
Endosulfan II	1.71E-02	**1.00E+00**	4.28E-03
Endrin	9.24E-03	**1.00E+00**	2.31E-03
Alpha-chlordane	1.48E-02	**1.00E+00**	3.70E-03
Gamma-chlordane	1.44E-02	**1.00E+00**	3.60E-03
Inorganic Analytes			
Aluminum	1.46E+04	**1.00E+00**	1.46E+04
Antimony	1.59E+01	**1.00E+00**	1.59E+01
Arsenic	2.72E+01	**1.00E+00**	1.63E+00

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Table V - 18

ESTIMATED SHORT-TAILED SHREW TISSUE CONCENTRATIONS CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Small Mammal Bioaccumulation Factors [a]	Small Mammal Maximum Tissue Concentrations (mg/kg)
Barium	1.04E+03	**1.00E+00**	3.74E+02
Beryllium	1.70E+00	**1.00E+00**	1.70E+00
Cadmium	4.80E+00	4.50E-01	1.01E+02
Chromium(III)	9.07E+01	**1.00E+00**	2.45E+01
Cobalt	1.72E+01	**1.00E+00**	1.72E+01
Copper	2.52E+03	3.20E-01	9.08E+02
Iron	1.31E+05	**1.00E+00**	4.98E+04
Lead	2.22E+03	1.00E-01	1.47E+03
Manganese	9.44E+02	**1.00E+00**	3.78E+02
Mercury	3.40E+00	**1.00E+00**	3.26E+00
Nickel	8.65E+01	**1.00E+00**	3.55E+01
Silver	5.80E+00	**1.00E+00**	5.80E+00
Thallium	4.80E-01	**1.00E+00**	4.80E-01
Vanadium	3.08E+01	**1.00E+00**	3.08E+01
Zinc	3.31E+03	2.50E-01	2.29E+04

a - A bioaccumulation factor of 1 (100%) was assumed for shrew tissue in the absence of literature data (EPA 1994a).

Bold, shaded numbers represent the assumption of 100% bioaccumulation for shrew tissue in the absence of literature data.

Table V - 19

ESTIMATED ROBIN TISSUE CONCENTRATIONS FOR THE UNDEVELOPED LANDFILL, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Bird Bioaccumulation Factors [a]	Bird Maximum Tissue Concentrations (mg/kg)
Volatile Organics			
Acetone	2.10E-02	**1.00E+00**	2.10E-02
Chloroform	3.00E-03	**1.00E+00**	3.00E-03
Ethylbenzene	4.60E-01	**1.00E+00**	4.60E-01
Tetrachloroethene	2.10E-02	**1.00E+00**	2.10E-02
Toluene	2.00E-03	**1.00E+00**	2.00E-03
Xylene	2.90E+00	**1.00E+00**	2.90E+00
Semivolatile Organics			
Acenaphthene	1.40E-01	**1.00E+00**	1.40E-01
Acenaphthylene	7.40E-01	**1.00E+00**	7.40E-01
Anthracene	9.30E-01	**1.00E+00**	9.30E-01
Benzo(a)anthracene	7.80E+00	**1.00E+00**	7.80E+00
Benzo(a)pyrene	7.00E+00	**1.00E+00**	7.00E+00
Benzo(b)fluoranthene	9.70E+00	**1.00E+00**	9.70E+00
Benzo(g,h,i)perylene	3.20E+00	**1.00E+00**	3.20E+00
Benzo(k)fluoranthene	9.80E+00	**1.00E+00**	9.80E+00
Carbazole	1.50E-01	**1.00E+00**	1.50E-01
Chrysene	7.10E+00	**1.00E+00**	7.10E+00
Dibenz(a,h)anthracene	1.00E+00	**1.00E+00**	1.00E+00
Dibenzofuran	1.00E-01	**1.00E+00**	1.00E-01
Diethylphthalate	3.90E-02	**1.00E+00**	3.90E-02
Di-N-butylphthalate	1.80E-01	**1.00E+00**	1.80E-01
Di-N-octylphthalate	7.30E-02	**1.00E+00**	7.30E-02
Fluoranthene	1.00E+01	**1.00E+00**	1.00E+01
Fluorene	2.50E-01	**1.00E+00**	2.50E-01
Indeno(1,2,3-cd)pyrene	3.10E+00	**1.00E+00**	3.10E+00
4-Methylphenol	1.00E-01	**1.00E+00**	1.00E-01
2-Methylnapthalene	7.80E-02	**1.00E+00**	7.80E-02
Naphthalene	1.20E-01	**1.00E+00**	1.20E-01
Phenanthrene	2.80E+00	**1.00E+00**	2.80E+00
Pyrene	1.50E+01	**1.00E+00**	1.50E+01
Pesticides/PCB			
DDD	3.12E-02	1.10E+01	3.43E-01
DDE	2.25E-02	1.10E+01	2.48E-01
DDT	2.59E-02	1.10E+01	2.85E-01
Endosulfan II	1.71E-02	**1.00E+00**	1.71E-02
Endrin	9.24E-03	**1.00E+00**	9.24E-03
Alpha-chlordane	1.48E-02	**1.00E+00**	1.48E-02
Gamma-chlordane	1.44E-02	**1.00E+00**	1.44E-02
Inorganic Analytes			
Aluminum	1.46E+04	**1.00E+00**	1.46E+04
Antimony	1.59E+01	**1.00E+00**	1.59E+01

Table V - 19

ESTIMATED ROBIN TISSUE CONCENTRATIONS FOR THE UNDEVELOPED LANDFILL, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Concentrations (mg/kg)	Bird Bioaccumulation Factors [a]	Bird Maximum Tissue Concentrations (mg/kg)
Arsenic	2.72E+01	**1.00E+00**	2.72E+01
Barium	1.04E+03	**1.00E+00**	1.04E+03
Beryllium	1.70E+00	**1.00E+00**	1.70E+00
Cadmium	4.80E+00	3.00E-02	1.44E-01
Chromium(III)	9.07E+01	**1.00E+00**	9.07E+01
Cobalt	1.72E+01	**1.00E+00**	1.72E+01
Copper	2.52E+03	6.00E-02	1.51E+02
Iron	1.31E+05	**1.00E+00**	1.31E+05
Lead	2.22E+03	2.40E-01	5.34E+02
Manganese	9.44E+02	**1.00E+00**	9.44E+02
Mercury	3.40E+00	**1.00E+00**	3.40E+00
Nickel	8.65E+01	**1.00E+00**	8.65E+01
Silver	5.80E+00	**1.00E+00**	5.80E+00
Thallium	4.80E-01	**1.00E+00**	4.80E-01
Vanadium	3.08E+01	**1.00E+00**	3.08E+01
Zinc	3.31E+03	1.30E-02	4.31E+01

a - A bioaccumulation factor of 1 (100%) was assumed for robin tissue in the absence of literature data (EPA 1994a).

Bold, shaded numbers represent the assumption of 100% bioaccumulation for robin tissue in the absence of literature data.

Table V - 20

SUMMARY OF TOXICITY BENCHMARK VALUES FOR THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Test Organism	Exposure Route-Duration	Endpoint	Critical Effects	TBV (mg/kg-bw)	Reference
1,1,1-Trichloroethane	Rat	Oral-78 weeks	NOAEL	Systemic	1500	ATSDR 1994 a
	Mouse	**Oral-78 weeks**	**NOAEL**	**Systemic**	**5615 [a]**	**ATSDR 1994 a**
1,1-Dichloroethene	Rat	Oral-2 years	NOAEL	Hepatic	10	ATSDR 1993 m
	Rat	**Oral-2 years**	**NOAEL**	**Reproduction**	**30 [a]**	**ATSDR 1993 m**
	Rat	Oral-2 years	NOAEL	Lethality	7	HSDB 1994
	Dog	Oral-97 days	NOAEL	Systemic	25	ATSDR 1993 m
1,2-Dichloroethene	**Mouse**	**Oral-90 days**	**NOAEL**	**Systemic**	**17 [a]**	**Barnes et. al. 1985**
	Mouse	**Oral-90 days**	**LOAEL**	**Hepatic**	**175**	**Barnes et. al. 1985**
Acetone	**Rat**	**Oral-95 days**	**LOAEL**	**Renal**	**500**	**ATSDR 1993 d**
	Rat	**Oral-95 days**	**NOAEL**	**Renal**	**100 [a]**	**IRIS 1994**
	Mouse	Oral-gestation	LOAEL	Reproduction	3500	EHRT 1987
	Japanese Quail	**Oral-5 days**	**NOAEL**	**Overt toxicity**	**5270 [a]**	**Hill and Camardese 1986**
Chloroform	**Rat**	**Oral-76 weeks**	**NOAEL**	**Hepatic**	**100 [a]**	**ATSDR 1992 d**
	Mouse	Oral-76 weeks	NOAEL	Reproduction	47.6	ATSDR 1992 d
Methylene Chloride	**Rat**	**Oral-18 weeks**	**NOAEL**	**Reproduction**	**225**	**HSDB 194**
	Rat	**Oral-104 weeks**	**LOAEL**	**Hepatotoxicity**	**250**	**ATSDR 1989 b**
Ethylbenzene	Rat	Oral-single dose	LD_{50}	Mortality	4728	ATSDR 1990 b
	Rat	**Oral-182 days**	**LOAEL**	**Liver and kidney histopathology**	**408 [a]**	**IRIS 1993**
Tetrachloroethene	**Rat**	**Oral-78 weeks**	**LOAEL**	**Renal**	**471**	**ATSDR 1993 e**
	Rat	Oral-120 days	NOAEL	Hepatic	14	IRIS 1994
	Mouse	**Oral-6 weeks**	**NOAEL**	**Hepatic**	**20 [a]**	**Buben and O'Flaherty 1985**
Toluene	Rat	Oral-13 weeks	NOAEL	Renal/hepatic	312	ATSDR 1992 l
	Rat	Oral-13 weeks	NOAEL	Systemic	1250	IRIS 1994
	Mouse	Oral-13 weeks	NOAEL	Reproduction	2500	ATSDR 1992 l
	Mouse	**Oral-15 days**	**LOAEL**	**Embryonic lethality**	**260 [a]**	**WHO 1985**
Xylene	**Rat (o-xylene)**	**Oral-10 days**	**NOAEL**	**Systemic effects**	**1000 [a]**	**ATSDR 1993 f**
	Rat (m-xylene)	Oral-13 weeks	NOAEL	Reproductive effects	800	ATSDR 1993 f
	Rat (p-xylene)	Oral-13 weeks	NOAEL	Reproductive effects	800	ATSDR 1993 f
	Rat (total)	Oral-103 weeks	NOAEL	Mortality	179	IRIS 1994
	Japanese quail (total)	Oral-single dose	NOAEL	Overt toxicity	719	Hill and Camardese 1986
2-Methylnapthalene	**Rat**	**Oral-1 dose**	**LD_{50}**	**Mortality**	**1630**	**RTECS 1994**
4-Methyphenol	NDA	NDA	NDA	NDA	NDA	NDA
Acenaphthene	**Mouse**	**Oral-90 days**	**NOAEL**	**Hepatotoxicity**	**175**	**IRIS 1994**
	Mallard	**Oral-7 months**	**LOAEL**	**Increased hepatic stress**	**407**	**Patton and Dieter 1980**
Acenaphthylene	**Mallard**	**Oral-7 months**	**LOAEL**	**Increased hepatic stress**	**407**	**Patton and Dieter 1980**

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Table V - 20

SUMMARY OF TOXICITY BENCHMARK VALUES FOR THE UNDEVELOPED LANDFILL
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Test Organism	Exposure Route-Duration	Endpoint	Critical Effects	TBV (mg/kg-bw)	Reference
Anthracene	Mouse	Oral-90 days	NOAEL	Adverse effects	1000	IRIS 1991
	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Benzo(a)anthracene	Rat	Oral-4 days	NOAEL	Systemic	150	ATSDR 1990 e
	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Benzo(a)pyrene	Mouse	Oral-6 months	LOAEL	Aplastic anemia	120	ATSDR 1990 f
	Rat	Oral-NDA	LD_{50}	Mortality	50	Eisler 1987 a
	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Benzo(b)fluoranthene	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Benzo(g,h,i)perylene	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Benzo(k)fluoranthene	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Bis(2-ethylhexyl)phthalate	Mouse	Oral-gestation	LOAEL	Reproduction	50	RTECS 1994
Butylbenzylphthalate	Rat	Oral-gestation	LOAEL	Reproduction	274	RTECS 1994
	Rat	Oral-26 weeks	NOAEL	Reproduction	160	RTECS 1994
Carbazole	NDA	NDA	NDA	NDA	NDA	NDA
Chrysene	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Dibenz(a,h)anthracene	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407	Patton and Dieter 1980
Dibenzofuran	NDA	NDA	NDA	NDA	NDA	NDA
Diethylphthalate	NDA	NDA	NDA	NDA	NDA	NDA
Di-N-butylphthalate	Rat	Oral-1 year	NOAEL	Mortality	125	Hardin et al. 1987
	Rat	Oral-1 year	LOAEL	Mortality	600	Hardin et al. 1987
Di-N-octylphthalate	NDA	NDA	NDA	NDA	NDA	NDA
Fluoranthene	Mouse	Oral-13 weeks	NOAEL	Liver weight/Nephropathy	125 [a]	IRIS 1992
	Rat	Oral-NDA	LD^{50}	Mortality	2000	Eisler 1987 a
	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407 [a]	Patton and Dieter 1980
Fluorene	Mouse	Oral-13 weeks	NOAEL	Hematological	125 [a]	IRIS 1991
	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407 [a]	Patton and Dieter 1980
Indeno(1,2,3-cd)pyrene	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407 [a]	Patton and Dieter 1980
Naphthalene	Rat	Oral-23 months	NOAEL	Mortality	41 [a]	ATSDR 1990 p
	Rat	Oral-NDA	LD_{50}	Mortality	1780 [a]	Eisler 1987 a
Phenanthrene	Mouse/Rat	Oral-1 dose	LD_{50}	Mortality	700 [a]	Eisler 1987 a
	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407 [a]	Patton and Dieter 1980
Pyrene	Mouse	Oral-13 weeks	NOAEL	Kidney weight/Nephropathy	75 [a]	IRIS 1992
	Mallard	Oral-7 months	LOAEL	Increased hepatic stress	407 [a]	Patton and Dieter 1980
Aldrin	Rat	Oral-3 generations	LOAEL	Reproduction	0.125	ATSDR 1993 n
	Rat	Oral-2 years	NOAEL	Neurological	0.05	ATSDR 1993 n

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SUMMARY OF TOXICITY BENCHMARK VALUES FOR THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Test Organism	Exposure Route-Duration	Endpoint	Critical Effects	TBV (mg/kg-bw)	Reference
	Coturnix	**Oral-5 days**	**LD_{50}**	**Mortality**	**3**	**Hill and Camardese 1986**
4,4'-DDD	Rat	Oral-78 weeks	NOAEL	Systemic	85	ATSDR 1993 a
	Mouse	Oral-78 weeks	NOAEL	Systemic	107	ATSDR 1993 a
	Mouse	**Oral-78 weeks**	**NOAEL**	**Systemic**	**428 [a]**	**ATSDR 1993 a**
	Ring-necked pheasant	**Oral-1 dose**	**LD_{50}**	**Mortality**	**386 [a]**	**HSDB 1994**
4,4'-DDE	Rat	Oral-78 weeks	NOAEL	Systemic	23	ATSDR 1993 a
	Mouse	Oral-78 weeks	NOAEL	Systemic	34	ATSDR 1993 a
	Rat	**Oral-78 weeks**	**LOAEL**	**Mortality**	**12.0 [a]**	**ATSDR 1993 a**
	Bobwhite	Oral-5 days	LD_{50}	Mortality	96.9	HSDB 1994
	Coturnix	**Oral-NDA**	**LD_{50}**	**Mortality**	**39.3 [a]**	**Hill and Camardese 1986**
4,4'-DDT	Rat	Oral-27 months	NOAEL	Respiratory effects	10	ATSDR 1993 a
	Mouse	Oral-78 weeks	NOAEL	Systemic	6	ATSDR 1993 a
	Rat	**Oral-60 weeks**	**LOAEL**	**Decreased fertility**	**0.35 [a]**	**ATSDR 1993 a**
	Ring-necked pheasant	**Oral-5 days**	**LD_{50}**	**Mortality**	**55 [a]**	**ATSDR 1993 a**
	California Quail	Oral-NDA	LC_{50}	Mortality	595	Hudson et al. 1984
Aroclor-1254	Rat	Oral-21 days/gestation	NOAEL	Developmental	1.25	ATSDR 1993 l
	Rat	**Oral-6 months**	**NOAEL**	**Hepatotoxicity**	**0.025**	**ATSDR 1993 l**
	Rat	Oral-chronic	NOAEL	Systemic	5	ATSDR 1993 l
	Mink	Oral-6 months	NOAEL	Reproduction	0.1	ATSDR 1993 l
	Chicken	Oral-subchronic	NOAEL	Growth	10	WHO 1976
	Chicken	Oral-subchronic	LOAEL	Growth	100	WHO 1976
	Finch	**Oral-56 days**	**LD_{50}**	**Mortality**	**254**	**WHO 1976**
Aroclor-1260	Rat	Oral-chronic	NOAEL	Systemic	5	ATSDR 1993 l
	Rat	**Oral-67 days**	**NOAEL**	**Development**	**6.9**	**ATSDR 1993 l**
	Chicken	Oral-subchronic	NOAEL	Growth	100	WHO 1976
	Bobwhite	**Oral-1 dose**	**LD_{50}**	**Mortality**	**87.7**	**HSDB 1994**
BHC-alpha	Mouse	Oral-360 days	NOAEL	Hepatic/Renal	2	Dikshith et al. 1991
	Rat	**Oral-56 weeks**	**NOAEL**	**Hepatic**	**2.5**	**Fitzhugh *et al*. 1950**
	Japanese Quail	**Oral-1 dose**	**LD_{50}**	**Mortality**	**68**	**Hill and Camardese 1986**
BHC-beta	Mouse	Oral-30 days	LOAEL	Reproduction	10	ATSDR 1993 o
	Mouse	Oral-360 days	NOAEL	Hepatic/Renal	2	Dikshith et al. 1991
	Rat	**Oral-64 weeks**	**LOAEL**	**Hepatic**	**0.5**	**ATSDR 1993 o**
	Japanese Quail	**Oral-1 dose**	**LD_{50}**	**Mortality**	**68**	**Hill and Camardese 1986**
BHC-delta [b]	Mouse	Oral-30 days	LOAEL	Reproduction	10	ATSDR 1993 o

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SUMMARY OF TOXICITY BENCHMARK VALUES FOR THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Test Organism	Exposure Route-Duration	Endpoint	Critical Effects	TBV (mg/kg-bw)	Reference
	Mouse	Oral-360 days	NOAEL	Hepatic/Renal	2	Dikshith et al. 1991
	Rat	**Oral-64 weeks**	**LOAEL**	**Hepatic**	**0.5**	**ATSDR 1993 o**
	Japanese Quail	**Oral-1 dose**	**LD_{50}**	**Mortality**	**68**	**Hill and Camardese 1986**
BHC-gamma	**Mouse**	**Oral-360 days**	**NOAEL**	**Hepatic/Renal**	**2**	**Dikshith et al. 1991**
	Mouse	Oral-12 weeks	LOAEL	Hepatic	6	ATSDR 1993 o
	Rat	**Oral-70 weeks**	**LOAEL**	**Hepatic**	**5**	**Fitzhugh et al. 1950**
	Japanese Quail	**Oral-1 dose**	**LD_{50}**	**Mortality**	**68**	**Hill and Camardese 1986**
Chlordane-alpha	**Rat**	**Oral-80 weeks**	**LOAEL**	**Systemic effects**	**20.4**	**ATSDR 1992 e**
	Mouse	**Oral-80 weeks**	**NOAEL**	**Systemic effects**	**8.3 [a]**	**ATSDR 1992 e**
	California Quail	**Oral-1 dose**	**LD_{50}**	**Mortality**	**14.1 [a]**	**Eisler 1990**
	Mallard	Oral-1 dose	LD_{50}	Mortality	1200	Eisler 1990
	Northern Bobwhite	Oral-100 days	LD_{50}	Mortality	250	Eisler 1990
	Coturnix	Oral-subchronic	LC_{50}	Mortality	16.2 [a]	Hill and Camardese 1986
Chlordane-gamma	**Rat**	**Oral-80 weeks**	**LOAEL**	**Mortality**	**6.0 [a]**	**ATSDR 1992 e**
	California Quail	**Oral-1 dose**	**LD_{50}**	**Mortality**	**14.1 [a]**	**Eisler 1990**
	Mallard	Oral-1 dose	LD_{50}	Mortality	1200	Eisler 1990
	Northern Bobwhite	Oral-100 days	LD_{50}	Mortality	250	Eisler 1990
	Coturnix	Oral-subchronic	LC_{50}	Mortality	16.2 [a]	Hill and Camardese 1986
Dieldrin	**Rat**	**Oral-3 generations**	**LOAEL**	**Reproduction**	**0.125**	**ATSDR 1993 n**
	Rat	**Oral-2 years**	**NOAEL**	**Neurological**	**0.05**	**ATSDR 1993 n**
	Coturnix	**Oral-5 days**	**LD_{50}**	**Mortality**	**3**	**Hill and Camardese 1986**
Dioxin (2,3,7,8-TCDD)	**Rat**	**Oral-10 days**	**NOAEL**	**Development**	**0.000015 [a]**	**ATSDR 1989 c**
	Chicken	**Oral-acute**	**LD_{50}**	**Mortality**	**0.001 [a]**	**McConnel 1985**
Endosulfan II [c]	**Rat (Endosulfan)**	**Oral-2 years**	**NOAEL**	**Systemic effects**	**5.0 [a]**	**ATSDR 1993 g**
	Mouse (Endosulfan)	Oral-24 months	NOAEL	Systemic effects	2.5	ATSDR 1993 g
	Mallard	**Oral-1 dose**	**LC_{50}**	**Mortality**	**31.2 [a]**	**Hudson et. al. 1984**
Endosulfan-Sulfate	**Mouse**	**Oral-84 days**	**NOAEL**	**Reproduction**	**0.75 [a]**	**ATSDR 1993 g**
	Mallard	**Oral-1 dose**	**LC_{50}**	**Mortality**	**31.2 [a]**	**Hudson et al. 1984**
Endrin	**Rat**	**Oral-24 months**	**NOAEL**	**Mortality**	**0.25 [a]**	**ATSDR 1993 h**
	Mouse	Oral-80 weeks	NOAEL	Renal	0.053	ATSDR 1993 h
	Coturnix	**Oral-1 dose**	**LC_{50}**	**Mortality**	**1.2 [a]**	**Hill and Camardese 1986**
Endrin-Aldehyde [d]	**Rat**	**Oral-24 months**	**NOAEL**	**Mortality**	**0.25**	**ATSDR 1993 h**
	Mouse	Oral-80 weeks	NOAEL	Renal	0.053	ATSDR 1993 h
	Coturnix	**Oral-1 dose**	**LC_{50}**	**Mortality**	**1.2 [a]**	**Hill and Camardese 1986**
Endrin-Ketone [d]	**Rat**	**Oral-24 months**	**NOAEL**	**Mortality**	**0.25 [a]**	**ATSDR 1993 h**

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Table V - 20

SUMMARY OF TOXICITY BENCHMARK VALUES FOR THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Test Organism	Exposure Route-Duration	Endpoint	Critical Effects	TBV (mg/kg-bw)	Reference
	Mouse	Oral-80 weeks	NOAEL	Renal	0.053	ATSDR 1993 h
	Coturnix	**Oral-1 dose**	**LC_{50}**	**Mortality**	**1.2** [a]	**Hill and Camardese 1986**
Heptachlor	Mouse	Oral-80 weeks	LOAEL	Mortality	2.3	ATSDR 1993 k
	Rat	Oral-1 dose	LD_{50}	Mortality	100	EPA 1985g
	Rat	**Oral-60 days**	**LOAEL**	**Reproduction**	**0.25** [a]	**ATSDR 1993 k**
	Mallard	**Oral-1 dose**	**LD_{50}**	**Mortality**	**2000** [a]	**ATSDR 1993 k**
Heptachlor-Epoxide [e]	**Rat**	**Oral-1 dose**	**LD_{50}**	**Mortality**	**60** [a]	**ATSDR 1993 k**
	Rat	Oral-5 days	NOAEL	Development	8	ATSDR 1993 k
	Mallard	**Oral-1 dose**	**LD_{50}**	**Mortality**	**2000** [a]	**ATSDR 1993 k**
Methoxychlor	**Rat**	**Oral-gestation**	**NOAEL**	**Development**	**30**	**ATSDR 1992 k**
	Rat	**Oral-59-76 days**	**LOAEL**	**Reproduction**	**50**	**ATSDR 1992 k**
Aluminum	**Mouse**	**Oral-chronic**	**NOAEL**	**Systemic**	**19**	**ATSDR 1991 a**
	Dog	Oral-6 months	NOAEL	Reproduction	60	ATSDR 1991 a
Antimony	**Rat**	**Oral-24 hour**	**LD_{50}**	**Mortality**	**525**	**RTECS 1994**
Arsenic	**Mouse**	**Oral-1 dose**	**LD_{50}**	**Mortality**	**39.4**	**Eisler 1988 b**
	Mouse	**Oral-chronic**	**NOAEL**	**Reproductive**	**0.7**	**ATSDR 1993 b**
	Brown-headed cowbird	**Oral-chronic**	**NOAEL**	**Mortality**	**7.32**	**Opresko et al. 1993**
	Mallard	Oral-1 dose	LD_{50}	Mortality	323	Eisler 1988 b
	California Quail	Oral-1 dose	LD_{50}	Mortality	47.6	Hudson et al. 1984
Barium	Rat	Oral-2 years	NOAEL	Systemic	0.7	ATSDR 1992 h
	Rat	**Oral-68 weeks**	**NOAEL**	**Histopathological**	**140**	**IRIS 1994**
	Rat	Oral-acute	NOAEL	Reproductive	138	ATSDR 1992 h
	Mouse	Oral-chronic	NOAEL	Systemic	30	NTP 1994
	California Quail	Oral-chronic	LOAEL	Decreased body weight	16.5	NRC 1980
Beryllium	**Rat**	**Oral-chronic**	**NOAEL**	**Systemic**	**31**	**ATSDR 1993 i**
	Rat	Oral-lifetime	NOAEL	Systemic	0.54	IRIS 1994
	Mouse	Oral-chronic	NOAEL	Systemic	0.95	ATSDR 1993 i
Cadmium	**Mouse**	**Oral-18 months**	**LOAEL**	**Histopathological effects**	**1.75**	**ATSDR 1993 c**
	Mouse	Oral-6 months	NOAEL	Reproductive effects	1.9	IRIS 1994
	Mallard	**Oral-90 days**	**LOAEL**	**EGG production suppressed**	**11.27**	**White and Findley 1978**
	Mallard	**Oral-12 weeks**	**NOAEL**	**Kidney degeneration**	**1.7**	**Caine et al. 1990**
Chromium III	Rat	Oral-90 days	NOAEL	Various organ and Histopathological effects	1400	Ivankovic and Preussman 1975
	Rat	Oral-2 years	NOAEL	Survivorship	1470	ATSDR 1993 j
	Rat	Oral-2 years	NOAEL	Systemic	2853	ATSDR 1993 j

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SUMMARY OF TOXICITY BENCHMARK VALUES FOR THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Test Organism	Exposure Route-Duration	Endpoint	Critical Effects	TBV (mg/kg-bw)	Reference
	Rat	Oral-chronic	NOAEL	Mortality	1806	IRIS 1994
	Mouse	**Oral-19 days**	**LOAEL**	**Reproduction**	**57 [a]**	**ATSDR 1993 j**
	Black duck	**Oral-5 months**	**NOAEL**	**Survival, Reproduction**	**4.75 [a]**	**Haseltine et al. 1985**
Cobalt	**Rat**	**Oral-69 days**	**LOAEL**	**Reproductive**	**5**	**Domingo et al. 1985**
	Rat	Oral-acute	LD_{50}	Mortality	91	Speijers et al. 1992
Copper	**Mouse**	**Oral-850 days**	**LOAEL**	**Survivorship**	**4.2**	**ATSDR 1990 c**
	Mouse	Oral-28 days	NOAEL	Fetal mortality	78	ATSDR 1990 c
	Mallard	Oral-29 days	NOAEL	Survivorship	0.12	Demayo et al. 1982
	Turkey	**Oral-21 days**	**NOAEL**	**Lethality/Growth depression**	**71**	**Vohra and Kratzer 1968**
Cyanide	**Mouse**	**Oral-acute**	**LD50**	**Mortality**	**3.4**	**Eisler 1991**
	Rats	Oral-acute	LD_{50}	Mortality	5.7	Eisler 1991
	Mallard	Oral-acute	LD_{50}	Mortality	1.43	Eisler 1991
	Japanese Quail	**Oral-acute**	**LD_{50}**	**Mortality**	**4.5**	**Eisler 1991**
Iron	**Mouse**	**Oral-1 dose**	**LD_{50}**	**Mortality**	**306**	**NRC 1980**
	Rat	Oral-acute	LD_{50}	Mortality	319	RTECS 1994
	Guinea pig	Oral-20 days	NOAEL	Systemic	5	EPA 1984
	Turkey	**Oral-12 weeks**	**NOAEL**	**Growth**	**29.5**	**NRC 1980**
Lead	**Mouse**	**Oral-11 days**	**NOAEL**	**Reproductive**	**39**	**Kennedy et al. 1975**
	Rat	Oral-NDA	NOAEL	Reproductive	0.7	ATSDR 1992 a
	Rat	Oral-30 days	NOAEL	Reproductive	0.014	ATSDR 1992 a
	American kestrel	**Oral-60 days**	**NOAEL**	**Weight loss/Anemia**	**28**	**Custer et al. 1984**
	American kestrel	Oral-5 months	NOAEL	Reproduction	6.1	Eisler 1988 a
	Duck	Oral-137 days	NOAEL	Survivorship	6	SAIC 1991
	American kestrel	Oral-6 months	NOAEL	Reproduction/Survival	9.1	Pattee 1984
	American kestrel	Oral-6 months	NOAEL	Reproduction/Survival	5.1	Eisler 1988 a
Manganese	**Rat**	**Oral-90 days**	**LOAEL**	**Reproduction**	**175**	**Laskey et al. 1982**
	Turkey	**Oral-21 days**	**NOAEL**	**Mortality/Growth**	**428**	**Vohra and Kratzer 1968**
Mercury	**Mouse**	**Oral-(gestation) 18 days**	**LOAEL**	**Embryolethality**	**0.7**	**Suzuki 1979**
	Mouse	**Oral-7 weeks**	**NOAEL**	**Immunological**	**0.42 [a]**	**ATSDR 1992 b**
	House sparrow	**Oral-1 dose**	**LD_{50}**	**Mortality**	**2.55**	**Eisler 1987 b**
	Mallard	**Oral-21 weeks**	**LOAEL**	**Reproductive**	**0.064 [a]**	**EPA.1993**
	Japanese Quail	Oral-1 dose	LD_{50}	Mortality	500	Hill and Camardese 1986
Nickel	Rat	Oral-11 weeks	LOAEL	Decreased number of offspring	50	ATSDR 1991 c
	Rat	**Oral-2 years**	**NOAEL**	**Systemic**	**5.0 [a]**	**ATSDR 1991 c**

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Table V - 20

SUMMARY OF TOXICITY BENCHMARK VALUES FOR THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Test Organism	Exposure Route-Duration	Endpoint	Critical Effects	TBV (mg/kg-bw)	Reference
	Rat	**Oral-2 years**	**LOAEL**	**Decreased body weight**	**25**	**ATSDR 1991 c**
	Japanese Quail	Oral-5 days	NOAEL	Survivorship	67.2	Hill and Camardese 1986
	Japanese Quail	**Oral-5 days**	**NOAEL**	**Toxicity**	**713 [a]**	**Hill and Camardese 1986**
Selenium	**Rat**	**Oral-acute**	**LOAEL**	**Hepatic**	**0.1**	**ATSDR 1994 b**
	Mouse	Oral-30 days	NOAEL	Reproduction	0.14	ATSDR 1994 b
Silver	Rat	Oral-2 weeks	NOAEL	Mortality	181.2	ATSDR 1990 d
	Rat	Oral-acute	LD_{50}	Mortality	222.2	ATSDR 1990 d
	Mouse	**Oral-125 days**	**LOAEL**	**Hypoactivity**	**18.1 [a]**	**ATSDR 1990 d**
Thallium	**Rat**	**Oral-90 days**	**NOAEL**	**Systemic**	**0.25 [a]**	**IRIS 1994**
	Rat	**Oral-60 days**	**LOAEL**	**Reproduction**	**0.7**	**Formigli et al. 1986**
	Starling	**Oral-acute**	**LD_{50}**	**Mortality**	**34.6 [a] - 56**	**Shafer et al 1983**
Vanadium	**Rat**	**Oral-6 months**	**LOAEL**	**Systemic**	**5.0 [a]**	**WHO 1988**
	Mouse	Oral-18 days	LOAEL	Embryonic	37.5	Paternain et al 1990
Zinc	Mouse	Oral-9 months	NOAEL	Anemia	16.3	ATSDR 1992 c
	Rat	**Oral-3 months**	**NOAEL**	**Kidney toxicity**	**160 [a]**	**Llobet et al. 1988**
	Turkey	**Oral-21 days**	**NOAEL**	**Mortality/Growth depression**	**210 [a]**	**Vohra and Kratzer 1968**
	Mallard	Oral-30 day	LOAEL	Leg paralysis	3000	NDAS 1979
	Mallard	Oral-30 day	LOAEL	Mortality	495	Grandy et al. 1968
	Chicken	Oral-4 days	LOAEL	Induced molting	4375	Puls 1988

Dose equations have been adjusted for body weight and average daily intake.

NDA - No data available

[a] TBVs selected for the Phase I ERA.

[b] TBVs for beta-BHC were substituted in the absence of toxicity information.

[c] Mallard TBV for endosulfan sulfate was substituted in the absence of toxicity information.

[d] TBVs for endrin used in the absence of toxicity information.

[e] Mallard TBV for heptachlor was substituted in the absence of toxicity information.

Bold, shaded rows represent those ecotoxicological studies selected for the derivation of NOAELs and LOAELs for measurement species (shrew, robin, and kestrel).

Source: Ecology and Environment, Inc., 1994.

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Table V - 21

SUMMARY OF TOXICITY SCREENING DATA IN SURFACE SOIL FOR PLANTS AND COMPARISONS TO REPORTED ESI AND RRII SOIL CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Site-Related Stressor	Species	Experimental Soil Concentration (mg/kg dry wt)	Effect	Ratio of the Number of Exceedances per the Number of ESI Soil Samples	Ratio of the Number of Exceedances per the Number of RRII Soil Samples	Reference
Volatile Organic Substances						
1,1,1-Trichloroethane	No Data	--	--	--	--	--
1,1-Dichloroethene	No Data	--	--	--	--	--
1,2-Dichloroethene	No Data	--	--	--	--	--
Acetone	No Data	--	--	--	--	--
Chloroform	No Data	--	--	--	--	--
Ethylbenzene	No Data	--	--	--	--	--
Tetrachloroethene	No Data	--	--	--	--	--
Toluene	No Data	--	--	--	--	--
Xylenes (total)	No Data	--	--	--	--	--
Semivolatile Organic Substances						
2-methylnaphthalene	No Data	--	--	--	--	--
4-methylphenol	No Data	--	--	--	--	--
Acenaphthene	No Data	--	--	--	--	--
Acenaphthylene	No Data	--	--	--	--	--
Anthracene	No Data	--	--	--	--	--
Benzo(a)anthracene	No Data	--	--	--	--	--
Benzo(a)pyrene	No Data	--	--	--	--	--
Benzo(b)fluoranthene	No Data	--	--	--	--	--
Benzo(g,h,i)perylene	No Data	--	--	--	--	--
Benzo(k)fluoranthene	No Data	--	--	--	--	--
Carbazole	No Data	--	--	--	--	--
Chrysene	No Data	--	--	--	--	--
Dibenz(a,h)anthracene	No Data	--	--	--	--	--
Dibenzofuran	No Data	--	--	--	--	--
Diethylphthalate	No Data	--	--	--	--	--
Di-N-butylphthalate	Corn shoots	2000 [a]	17% decrease in height; 25% decrease in weight; chlorosis	0/4	NE	EPA 1985 a
Di-N-octylphthalate	No Data	--	--	--	--	--
Fluoranthene	No Data	--	--	--	--	--

Table V - 21

SUMMARY OF TOXICITY SCREENING DATA IN SURFACE SOIL FOR PLANTS AND COMPARISONS TO REPORTED ESI AND RRII SOIL CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Site-Related Stressor	Species	Experimental Soil Concentration (mg/kg dry wt)	Effect	Ratio of the Number of Exceedances per the Number of ESI Soil Samples	Ratio of the Number of Exceedances per the Number of RRII Soil Samples	Reference
Fluorene	No Data	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	No Data	--	--	--	--	--
Naphthalene	No Data	--	--	--	--	--
Phenanthrene	No Data	--	--	--	--	--
Pyrene	No Data	--	--	--	--	--
Pesticides/PCBs						
4,4'-DDD [b]	Black Valentine (Bean)	12.5 [a]	35% reduction in root weight	0/4	NE	EPA 1985i
4,4'-DDE [b]	Black Valentine (Bean)	12.5 [a]	35% reduction in root weight	0/4	NE	EPA 1985i
4,4'-DDT	Black Valentine (Bean)	12.5 [a]	35% reduction in root weight	0/4	0/41	EPA 1985i
Aroclor-1254	No Data	--	--	--	--	--
Aroclor-1260	No Data	--	--	--	--	--
BHC-alpha	Sugarcane	10	root growth	ND	0/41	EPA 1985c
BHC-beta	Sugarcane	10	root growth	ND	0/41	EPA 1985c
BHC-gamma	Sugarcane	10	root growth	ND	0/41	EPA 1985c
Chlordane-alpha	Black Valentine (bean/top)	12.5 [a]	19% reduction in weight	0/4	NE	EPA 1985k
Chlordane-gamma	Black Valentine (bean/top)	12.5 [a]	19% reduction in weight	0/4	NE	EPA 1985k
Endosulfan II	No Data	--	--	--	--	--
Endrin	No Data	--	--	--	--	--
Endrin-Aldehyde	No Data	--	--	--	--	--
Endrin-Ketone	No Data	--	--	--	--	--
Heptachlor	Black Valentine	12.5	reduction in weight	ND	0/41	EPA 1985l
Heptachlor-Epoxide [c]	Black Valentine	12.5	reduction in weight	ND	0/41	EPA 1985l
Methoxychlor	No Data	--	--	--	--	--
Dioxins/Furans						
2,3,7,8-TCDD	No Data	--	--	--	--	--
Inorganic Substances						
Aluminum	No Data	--	--	--	--	--
Antimony	No Data	--	--	--	--	--
Arsenic	Cotton	8.0 [a]	wilted leaf/stubby roots	4/4	46/52	EPA 1985m
Barium	No Data	--	--	--	--	--

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Table V - 21

SUMMARY OF TOXICITY SCREENING DATA IN SURFACE SOIL FOR PLANTS AND COMPARISONS TO REPORTED ESI AND RRII SOIL CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Site-Related Stressor	Species	Experimental Soil Concentration (mg/kg dry wt)	Effect	Ratio of the Number of Exceedances per the Number of ESI Soil Samples	Ratio of the Number of Exceedances per the Number of RRII Soil Samples	Reference
Beryllium	Tomato	0.5 [a]	growth depression	3/4	8/52	EPA 1985j
Cadmium	Wheat	2.5 [a]	21% decrease in yield	2/4	29/52	EPA 1985d
Chromium (III)	Corn	320 [a]	97% weight decrease	0/4	0/52	EPA 1985s
Cobalt	No Data	--	--	--	--	--
Copper (sulfate)	Lettuce	42 [a]	4% decrease in yield	4/4	48/52	EPA, 1985e
Cyanide	No Data	--	--	--	--	--
Iron	Alfalfa	2,134	growth and development	4/4	52/52	EPA 1985f
Lead	Oats/Red Clover	50	decrease in yield	4/4	49/52	EPA 1985g
Manganese	No Data	--	--	--	--	--
Mercury (MMH)	Tomato seedling	0.003 [a]	9.9% growth reduction	4/4	52/52	EPA 1985n
Nickel	Oats	12.5	decrease in height	3/4	50/52	EPA 1985h
Silver	No Data	--	--	--	--	--
Thallium	No Data	--	--	--	--	--
Vanadium	No Data	--	--	--	--	--
Zinc (sulfate)	Bush Bean/pod	180	decrease in yield	4/4	47/52	EPA, 1985o

a. Represents the lowest concentration at which adverse effects are observed (LOAEL) in the absence of published NOAEL data.

b. Value for DDT used in absence of toxicity data.

c. Value for heptachlor used in the absence of toxicity data.

NE - Not evaluated

ND - Not detected

Source: Ecology and Environment, Inc. 1994.

Table V - 22

SUMMARY OF ECOTOXICOLOGICAL SCREENING DATA IN SURFACE SOIL FOR SOIL MACROINVERTEBRATES AND COMPARISONS TO REPORTED ESI AND RRII SOIL CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Site-Related Stressor	Species	Experimental Soil Concentration (mg/kg dry wt)	Effect	Ratio of the Number of Exceedances per the Number of ESI Soil Samples	Ratio of the Number of Exceedances per the Number of RRII Soil Samples	Reference
Volatile Organic Substances						
1,1,1-Trichloroethane	No Data	--	--	--	--	--
1,1-Dichloroethene	No Data	--	--	--	--	--
1,2-Dichloroethene	No Data	--	--	--	--	--
Acetone	No Data	--	--	--	--	--
Chloroform	No Data	--	--	--	--	--
Ethylbenzene	No Data	--	--	--	--	--
Tetrachloroethene	No Data	--	--	--	--	--
Toluene	No Data	--	--	--	--	--
Xylenes (total)	No Data	--	--	--	--	--
Semivolatile Organic Substances						
4-methylphenol	No Data	--	--	--	--	--
2-methylnaphthalene	No Data	--	--	--	--	--
Acenaphthene	No Data	--	--	--	--	--
Acenaphthylene	No Data	--	--	--	--	--
Anthracene	No Data	--	--	--	--	--
Benzo(a)anthracene	No Data	--	--	--	--	--
Benzo(a)pyrene	No Data	--	--	--	--	--
Benzo(b)fluoranthene	No Data	--	--	--	--	--
Benzo(g,h,i)perylene	No Data	--	--	--	--	--
Benzo(k)fluoranthene	No Data	--	--	--	--	--
Carbazole	No Data	--	--	--	--	--
Chrysene	No Data	--	--	--	--	--
Dibenz(a,h)anthracene	No Data	--	--	--	--	--
Dibenzofuran	No Data	--	--	--	--	--
Diethylphthalate	No Data	--	--	--	--	--
Di-N-butylphthalate	No Data	--	--	--	--	--
Di-N-octylphthalate	No Data	--	--	--	--	--

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SUMMARY OF ECOTOXICOLOGICAL SCREENING DATA IN SURFACE SOIL FOR SOIL MACROINVERTEBRATES AND COMPARISONS TO REPORTED ESI AND RRII SOIL CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Site-Related Stressor	Species	Experimental Soil Concentration (mg/kg dry wt)	Effect	Ratio of the Number of Exceedances per the Number of ESI Soil Samples	Ratio of the Number of Exceedances per the Number of RRII Soil Samples	Reference
Fluoranthene	No Data	--	--	--	--	--
Fluorene	Earthworm	173 [a]	LC50	0/4	NE	EPA 1985b
Indeno(1,2,3-cd)pyrene	No Data	--	--	--	--	--
Naphthalene	No Data	--	--	--	--	--
Phenanthrene	No Data	--	--	--	--	--
Pyrene	No Data	--	--	--	--	--
Pesticides/PCBs						
4,4'-DDD [b]	Earthworm	1.5	mortality	0/4	NE	EPA 1985i
4,4'-DDE	Earthworm	1.5	mortality	0/4	NE	EPA 1985i
4,4'-DDT	Soil Fungus	12.5	mortality	0/4	0/41	EPA 1985i
Aroclor-1254	No Data	--	--	--	--	--
Aroclor-1260	No Data	--	--	--	--	--
BHC-alpha	Bacteria/fungi	12.5	decrease in fungi	ND	0/41	EPA 1985c
BHC-beta	Bacteria/fungi	12.5	decrease in fungi	ND	0/41	EPA 1985c
BHC-gamma	Bacteria/fungi	12.5	decrease in fungi	ND	0/41	EPA 1985c
Chlordane-alpha	Soil bacteria	2.25 [a]	24% reduction in total count	0/4	NE	EPA 1985k
Chlordane-gamma	Soil bacteria	2.25 [a]	24% reduction in total count	0/4	NE	EPA 1985k
Endosulfan II	No Data	--	--	--	--	--
Endrin	No Data	--	--	--	--	--
Endrin-Aldehyde	No Data	--	--	--	--	--
Endrin-Ketone	No Data	--	--	--	--	--
Heptachlor	Soil fungi	12.5 [a]	9.5% reduction in fungus count	0/4	0/41	EPA 1985l
Heptachlor-Epoxide [c]	Soil fungi	12.5 [a]	9.5% reduction in fungus count	0/4	0/41	EPA 1985l
Methoxychlor	No Data	--	--	--	--	--
Dioxins/Furans						
2,3,7,8-TCDD	Bacteria	0.000052	decrease in CO_2 production	NE	22/36	EPA 1985p
Inorganic Substances						
Aluminum	No Data	--	--	--	--	--

Table V - 22

SUMMARY OF ECOTOXICOLOGICAL SCREENING DATA IN SURFACE SOIL FOR SOIL MACROINVERTEBRATES AND COMPARISONS TO REPORTED ESI AND RRII SOIL CONCENTRATIONS ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Site-Related Stressor	Species	Experimental Soil Concentration (mg/kg dry wt)	Effect	Ratio of the Number of Exceedances per the Number of ESI Soil Samples	Ratio of the Number of Exceedances per the Number of RRII Soil Samples	Reference
Antimony	No Data	--	--	--	--	--
Arsenic	No Data	--	--	--	--	--
Barium	No Data	--	--	--	--	--
Beryllium	No Data	--	--	--	--	--
Cadmium	Earthworm	1,843	LC50	0/4	0/52	EPA 1985d
Chromium (III)	No Data	--	--	--	--	--
Cobalt	Earthworm	3,000	growth	0/4	0/52	EPA 1985q
Copper (chloride)	Earthworm	131 [a]	decrease in cocoon production	3/4	37/52	EPA 1985e
Cyanide	Nitrifying bacteria	100	decrease in N_2 production	ND	0/52	EPA 1985r
Iron	No Data	--	--	--	--	--
Lead	Soil cellulose decomposing bacteria	500	decrease in yield	3/4	34/52	EPA 1985g
Manganese	No Data	--	--	--	--	--
Mercury (HgCl2)	No Data	--	--	--	--	--
Nickel	Soil microorganisms	25	decrease in CO_2 production	3/4	41/52	EPA 1985h
Silver	No Data	--	--	--	--	--
Thallium	No Data	--	--	--	--	--
Vanadium	No Data	--	--	--	--	--
Zinc	Soil microorganisms	50	decrease in CO_2 production	4/4	52/52	EPA 1985o

a. Represents the lowest concentration at which adverse effects are observed (LOAEL) in the absence of published NOAEL data.

b. Value for DDE used in absence of toxicity data.

c. Value for heptachlor used in the absence of toxicity data.

NE - Not evaluated

ND - Not detected

Source: Ecology and Environment, Inc., 1994.

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Table V - 23

APPROACH AND UNCERTAINTY FACTORS UTILIZED FOR MAMMALIAN AND AVIAN RECEPTORS AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

TBV	TRV (or Intermediate)	Divide By (safety factor)
- Acute Lethal Dose (LD_{50})	- Acute, subchronic, or chronic LOAEL	10
- Acute, Subchronic, or chronic LOAEL	- Chronic NOAEL	10
As an example in developing TRVs for a shrew when the only value available is an LD_{50} for a rat, the following steps would be taken:		
Rat LD_{50} for stressor = 50 mg/kg BW:		
1. Acute Lethality	----> Acute, subchronic, or chronic Toxicity Threshold	50 mg/kg BW / 10 = 5 mg/kg BW
2. Acute, subchronic, or chronic Toxicity Threshold	----> Chronic NOAEL	5 mg/kg BW / 10 = 0.5 mg/kg BW

LD_{50} = Lethal dose to 50% of population.

LOAEL = Lowest observed effect level

mg/kg = Milligrams per kilogram.

TBV = Toxicity benchmark value.

TRV = Toxicity Reference Value.

NOAEL = No observed effect level.

Source: Ecology and Environment, Inc., 1994.

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Table V - 24

TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
1,1,1-Trichloroethane	Short-tailed shrew	5,615	Mouse	NOAEL	1	1	1	5,615
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
1,1-Dichloroethene	Short-tailed shrew	30	Rat	NOAEL	1	1	1	30
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
1,2-Dichloroethene	Short-tailed shrew	17	Mouse	NOAEL	1	1	1	17
	Short-tailed shrew	175[a]	Mouse	LOAEL	--	--	--	--
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Acetone	Short-tailed shrew	100	Rat	NOAEL	1	1	1	100
	Short-tailed shrew	500[a]	Rat	LOAEL	--	--	--	--
	American robin	5,270	Japanese quail	NOAEL	1	1	1	5,270
	American kestrel	5,270	Japanese quail	NOAEL	1	1	1	5,270
Chloroform	Short-tailed shrew	100	Rat	NOAEL	1	1	1	100
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Ethylbenzene	Short-tailed shrew	408[a]	Rat	LOAEL	1	10	10	40.8
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Methylene Chloride	Short-tailed shrew	225	Rat	NOAEL	1	1	1	225
	Short-tailed shrew	250 [a]	Rat	LOAEL	--	--	--	--
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Tetrachloroethene	Short-tailed shrew	20	Mouse	NOAEL	1	1	1	20
	Short-tailed shrew	471[a]	Rat	LOAEL	--	--	--	--
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA

Table V - 24

TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
Toluene	Short-tailed shrew	260[a]	Mouse	LOAEL	1	10	10	26
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Xylene	Short-tailed shrew	1,000	Rat (o-xylene)	NOAEL	1	1	1	1,000
	American robin	719	Japanese quail	NOAEL	1	1	1	719
	American kestrel	719	Japanese quail	NOAEL	1	1	1	719
2-Methylnapthalene	Short-tailed shrew	1,630	Rat	LD_{50}	10 (163[a])	10	100	16.3
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
4-Methyphenol	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Acenaphthene	Short-tailed shrew	175	Mouse	NOAEL	1	1	1	175
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Acenaphthylene	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Anthracene	Short-tailed shrew	1,000	Mouse	NOAEL	1	1	1	1,000
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Benzo(a)anthracene	Short-tailed shrew	150	Rat	NOAEL	1	1	1	150
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Benzo(a)pyrene	Short-tailed shrew	50	Rat	LD_{50}	10 (5[a])	10	100	0.5
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Benzo(b)fluoranthene	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Benzo(g,h,i)perylene	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Benzo(k)fluoranthene	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Bis(2-ethylhexyl)phthalate	Short-tailed shrew	50[a]	Mouse	LOAEL	1	10	10	5
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Butylbenzylphthalate	Short-tailed shrew	160	Rat	NOAEL	1	1	1	160
	Short-tailed shrew	274[a]	Rat	LOAEL	--	--	--	--
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Carbazole	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Chrysene	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Di-N-butylphthalate	Short-tailed shrew	125	Rat	NOAEL	1	1	1	125
	Short-tailed shrew	600[a]	Rat	LOAEL	--	--	--	--
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Di-N-octylphthalate	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
Dibenz(a,h)anthracene	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Dibenzofuran	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Diethylphthalate	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Fluoranthene	Short-tailed shrew	125	Mouse	NOAEL	1	1	1	125
	Short-tailed shrew	2,000	Rat	LD_{50}	10 (200[a])	--	10	--
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Fluorene	Short-tailed shrew	125	Mouse	NOAEL	1	1	1	125
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Indeno(1,2,3-cd)pyrene	Short-tailed shrew	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407a	Mallard	LOAEL	1	10	10	40.7
Naphthalene	Short-tailed shrew	41	Rat	NOAEL	1	1	1	41
	Short-tailed shrew	1,780	Rat	LD_{50}	10 (178[a])	--	10	--
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Phenanthrene	Short-tailed shrew	700	Mouse/Rat	LD_{50}	10 (70[a])	10	100	7
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Pyrene	Short-tailed shrew	75	Mouse	NOAEL	1	1	1	75
	American robin	407[a]	Mallard	LOAEL	1	10	10	40.7

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
	American kestrel	407[a]	Mallard	LOAEL	1	10	10	40.7
Aldrin	Short-tailed shrew	0.05	Rat	NOAEL	1	1	1	0.05
	Short-tailed shrew	0.125 [a]	Rat	LOAEL	--	--	--	--
	American robin	3	Coturnix	LD_{50}	10 (0.3[a])	10	100	0.03
	American kestrel	3	Coturnix	LD_{50}	10 (0.3[a])	10	100	0.03
4,4'-DDD	Short-tailed shrew	428	Mouse	NOAEL	1	1	1	428
	American robin	386	Ring-necked pheasant	LD_{50}	10 (38.6[a])	10	100	3.86
	American kestrel	386	Ring-necked pheasant	LD_{50}	10 (38.6[a])	10	100	3.86
4,4'-DDE	Short-tailed shrew	12[a]	Rat	LOAEL	1	10	100	1.2
	American robin	39.3	Coturnix	LD_{50}	10 (3.93[a])	10	100	0.393
	American kestrel	39.3	Coturnix	LD_{50}	10 (3.93[a])	10	100	0.393
4,4'-DDT	Short-tailed shrew	0.35[a]	Rat	LOAEL	1	10	10	0.035
	American robin	55	Ring-necked pheasant	LD_{50}	10 (5.5[a])	10	100	0.55
	American kestrel	55	Ring-necked pheasant	LD_{50}	10 (5.5[a])	10	100	0.55
Aroclor-1254	Short-tailed shrew	5	Rat	NOAEL	1	1	1	5
	American robin	254	Finch	LD_{50}	10 (25.4[a])	10	100	2.54
	American kestrel	254	Finch	LD_{50}	10 (25.4[a])	10	100	2.54
Aroclor-1260	Short-tailed shrew	6.9	Rat	NOAEL	1	1	1	6.9
	American robin	87.7	Bobwhite	LD_{50}	10 (8.77[a])	10	100	0.877
	American kestrel	87.7	Bobwhite	LD_{50}	10 (8.77[a])	10	100	0.877
BHC-alpha	Short-tailed shrew	2.5	Rat	NOAEL	1	1	1	2.5
	American robin	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
	American kestrel	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
BHC-beta	Short-tailed shrew	0.5 [a]	Rat	LOAEL	1	10	10	0.05
	American robin	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
	American kestrel	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
BHC-delta [b]	Short-tailed shrew	0.5 [a]	Rat	LOAEL	1	10	10	0.05

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
	American robin	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
	American kestrel	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
BHC-gamma	Short-tailed shrew	2	Mouse	NOAEL	1	1	1	2
	Short-tailed shrew	5.0 [a]	Rat	LOAEL	--	--	--	--
	American robin	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
	American kestrel	68	Japanese quail	LD_{50}	10 (6.8[a])	10	100	0.68
Chlordane-alpha	Short-tailed shrew	20.4[a]	Rat	LOAEL	--	--	--	--
	Short-tailed shrew	8.3	Mouse	NOAEL	1	1	1	8.3
	American robin	14.1	California Quail	LD_{50}	10 (1.41)[a]	10	100	0.141
	American kestrel	14.1	California Quail	LD_{50}	10 (1.41)[a]	10	100	0.141
Chlordane-gamma	Short-tailed shrew	6[a]	Rat	LOAEL	1	10	10	0.6
	American robin	14.1	California Quail	LD_{50}	10 (1.41[a])	10	100	0.141
	American kestrel	14.1	California Quail	LD_{50}	10 (1.41[a])	10	100	0.141
Dieldrin	Short-tailed shrew	0.05	Rat	NOAEL	1	1	1	0.05
	Short-tailed shrew	0.125 [a]	Rat	LOAEL	--	--	--	--
	American robin	3	Coturnix	LD_{50}	10 (0.3[a])	10	100	0.03
	American kestrel	3	Coturnix	LD_{50}	10 (0.3[a])	10	100	0.03
Dioxin (2,3,7,8-TCDD)	Short-tailed shrew	0.000015	Rat	NOAEL	1	1	1	0.000015
	American robin	0.001	Chicken	LD_{50}	10 (0.0001[a])	10	100	0.00001
	American kestrel	0.001	Chicken	LD_{50}	10 (0.0001[a])	10	100	0.00001
Endosulfan II	Short-tailed shrew	5	Rat (Endosulfan)	NOAEL	1	1	1	5
	American robin	31.2	Mallard	LC_{50}	10 (3.12[a])	10	100	0.312
	American kestrel	31.2	Mallard	LC_{50}	10 (3.12[a])	10	100	0.312
Endosulfan-Sulfate	Short-tailed shrew	0.75	Mouse	NOAEL	1	1	1	0.75
	American robin	31.2	Mallard	LC_{50}	10 (3.12[a])	10	100	0.312
	American kestrel	31.2	Mallard	LC_{50}	10 (3.12[a])	10	100	0.312
Endrin	Short-tailed shrew	0.25	Rat	NOAEL	1	1	1	0.25

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Endrin-Aldehyde [c]	Short-tailed shrew	0.25	Rat	NOAEL	1	1	1	0.25
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Endrin-Ketone [c]	Short-tailed shrew	0.25	Rat	NOAEL	1	1	1	0.25
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Heptachlor	Short-tailed shrew	0.25[a]	Rat	LOAEL	1	10	10	0.025
	American robin	2,000	Mallard	LD_{50}	10 (200[a])	10	100	20
	American kestrel	2,000	Mallard	LD_{50}	10 (200[a])	10	100	20
Heptachlor-Epoxide [d]	Short-tailed shrew	60	Rat	LD_{50}	10 (6[a])	10	100	0.6
	American robin	2,000	Mallard	LD_{50}	10 (200[a])	10	100	20
	American kestrel	2,000	Mallard	LD_{50}	10 (200[a])	10	100	20
Methoxychlor	Short-tailed shrew	30	Rat	NOAEL	1	1	1	30
	Short-tailed shrew	50[a]	Rat	LOAEL	--	--	--	--
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Aluminum	Short-tailed shrew	19	Mouse	NOAEL	1	1	1	19
	American robin	111	NDA	LD_{50}	10 (11.1[a])	10	100	1.11
	American kestrel	111	NDA	LD_{50}	10 (11.1[a])	10	100	1.11
Antimony	Short-tailed shrew	525	Rat	LD_{50}	10 (52.5[a])	10	100	5.25
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Arsenic	Short-tailed shrew	39.4	Mouse	LD_{50}	10 (3.94[a])	--	10	--
	Short-tailed shrew	0.7	Mouse	NOAEL	1	1	1	0.7
	American robin	7.32	Brown-headed cowbird	NOAEL	1	1	1	7.32

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
	American kestrel	7.32	Brown-headed cowbird	NOAEL	1	1	1	7.32
Barium	Short-tailed shrew	140	Rat	NOAEL	1	1	1	140
	American robin	16.5[a]	California Quail	LOAEL	1	10	10	1.65
	American kestrel	16.5[a]	California Quail	LOAEL	1	10	10	1.65
Beryllium	Short-tailed shrew	31	Mouse	NOAEL	1	1	1	31
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Cadmium	Short-tailed shrew	1.75[a]	Mouse	LOAEL	1	10	10	0.175
	American robin	11.27[a]	Mallard	LOAEL	--	--	--	--
	American kestrel	11.27[a]	Mallard	LOAEL	--	--	--	--
	American robin	1.7	Mallard	NOAEL	1	1	1	1.7
	American kestrel	1.7	Mallard	NOAEL	1	1	1	1.7
Chromium III	Short-tailed shrew	57[a]	Mouse	LOAEL	1	10	10	5.7
	American robin	4.75	Black duck	NOAEL	1	1	1	4.75
	American kestrel	4.75	Black duck	NOAEL	1	1	1	4.75
Cobalt	Short-tailed shrew	5[a]	Rat	LOAEL	1	10	10	0.5
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Copper	Short-tailed shrew	4.2[a]	Mouse	LOAEL	1	10	10	0.42
	American robin	71	Turkey	NOAEL	1	1	1	71
	American kestrel	71	Turkey	NOAEL	1	1	1	71
Cyanide	Short-tailed shrew	3.4	Mouse	LD_{50}	10(0.34[a])	10	100	0.034
	American robin	4.5	Japanese quail	LD_{50}	10(0.45[a])	10	100	0.045
	American kestrel	4.5	Japanese quail	LD_{50}	10(0.45[a])	10	100	0.045
Iron	Short-tailed shrew	306	Mouse	LD_{50}	10 (30.6[a])	10	100	3.06
	American robin	29.5	Turkey	NOAEL	1	1	1	29.5
	American kestrel	29.5	Turkey	NOAEL	1	1	1	29.5
Lead	Short-tailed shrew	39	Mouse	NOAEL	1	1	1	39

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
	American robin	28	American kestrel	NOAEL	1	1	1	28
	American kestrel	28	American kestrel	NOAEL	1	1	1	28
Manganese	Short-tailed shrew	175[a]	Rat	LOAEL	1	10	10	17.5
	American robin	428	Turkey	NOAEL	1	1	1	428
	American kestrel	428	Turkey	NOAEL	1	1	1	428
Mercury	Short-tailed shrew	0.7 [a]	Mouse	LOAEL	--	--	--	--
	Short-tailed shrew	0.42	Mouse	NOAEL	1	1	1	0.42
	American robin	2.55	House sparrow	LD_{50}	10(0.255[a])	10	100	0.0255
	American kestrel	0.064	Mallard	LOAEL	1	10	10	0.0064
Nickel	Short-tailed shrew	5	Rat	NOAEL	1	1	1	5
	Short-tailed shrew	25	Rat	LOAEL	--	--	--	--
	American robin	713	Japanese Quail	NOAEL	1	1	1	713
	American kestrel	713	Japanese Quail	NOAEL	1	1	1	713
Selenium	Short-tailed shrew	0.1 [a]	Rat	LOAEL	1	10	10	0.01
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Silver	Short-tailed shrew	18.1[a]	Mouse	LOAEL	1	10	10	1.81
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Thallium	Short-tailed shrew	0.7[a]	Rat	LOAEL	--	--	--	--
	Short-tailed shrew	0.25	Rat	NOAEL	1	1	1	0.25
	American robin	34.6	Starling	LD_{50}	10 (3.46[a])	10	100	0.346
	American kestrel	34.6	Starling	LD_{50}	10 (3.46[a])	10	100	0.346
Vanadium	Short-tailed shrew	5[a]	Rat	LOAEL	1	10	10	0.5
	American robin	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	American kestrel	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Zinc	Short-tailed shrew	160	Rat	NOAEL	1	1	1	160
	American robin	210	Turkey	NOAEL	1	1	1	210

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TOXICITY REFERENCE VALUES FOR MEASUREMENT SPECIES ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Chemical	Species	TBV (mg/kg-bw)	Test Organism	Endpoint	LD_{50} to Acute, Subchronic, or Chronic LOAEL UF	Acute, Subchronic, or Chronic LOAEL to Chronic NOAEL UF	Combined UF	TRV (mg/kg-d)
	American kestrel	210	Turkey	NOAEL	1	1	1	210
	American robin	4,375[a]	Chicken	LOAEL	--	--	--	--
	American kestrel	4,375[a]	Chicken	LOAEL	--	--	--	--

NDA - No data available

[a] Denotes the LOAEL value used in the Analysis Phase of the ERA.

[b] TRVs for beta-BHC used in the absence of toxicity data.

[c] TRVs for endrin used in the absence of toxicity data.

[d] Avian TRVs for heptachlor used in the absence of toxicity data.

Key:

NOAEL - No observed adverse effects level.

LOAEL - Lowest observed adverse effects level.

LD50 - Dose (mg/kg-bw) at which 50% of the population dies.

LC50 - Concentration in food (ppm) at which 50% of the population dies.

Source: Ecology and Environment, Inc., 1994.

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SHORT-TAILED SHREW MAXIMUM HAZARD QUOTIENTS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion Hazard Quotient NOAEL	Maximum Earthworm Ingestion Hazard Quotient NOAEL	Maximum Stressor Hazard Index NOAEL
Volatile Organics			
Acetone	7.28E-06	7.00E-05	7.73E-05
Chloroform	1.04E-06	1.00E-05	1.10E-05
Ethylbenzene	3.91E-04	3.76E-03	4.15E-03
Tetrachloroethene	3.64E-05	3.50E-04	3.86E-04
Toluene	2.67E-06	2.56E-05	2.83E-05
Xylene	1.01E-04	9.67E-04	1.07E-03
Semivolatile Organics			
Acenaphthene	2.77E-05	8.00E-05	1.08E-04
Acenaphthylene	NE	NE	NE
Anthracene	3.22E-05	1.55E-05	4.77E-05
Benzo(a)anthracene	1.80E-03	1.73E-03	3.54E-03
Benzo(a)pyrene	4.85E-01	1.40E+00	**1.89E+00**
Benzo(b)fluoranthene	NE	NE	NE
Benzo(g,h,i)perylene	NE	NE	NE
Benzo(k)fluoranthene	NE	NE	NE
Carbazole	NE	NE	NE
Chrysene	NE	NE	NE
Dibenz(a,h)anthracene	NE	NE	NE
Dibenzofuran	NE	NE	NE
Diethylphthalate	NE	NE	NE
Di-N-butylphthalate	4.99E-05	4.80E-04	5.30E-04
Di-N-octylphthalate	NE	NE	NE
Fluoranthene	2.77E-03	2.13E-03	4.91E-03
Fluorene	6.93E-05	1.33E-04	2.03E-04
Indeno(1,2,3-cd)pyrene	NE	NE	NE
4-Methylphenol	NE	NE	NE
2-Methylnaphthalene	1.66E-04	3.19E-04	4.85E-04
Naphthalene	1.01E-04	2.05E-04	3.06E-04
Phenanthrene	1.39E-02	1.33E-02	2.72E-02
Pyrene	6.93E-03	6.00E-03	1.29E-02
Pesticides/PCBs			
DDD	2.53E-06	4.86E-06	7.39E-06
DDE	6.50E-04	1.56E-03	2.21E-03
DDT	2.57E-02	6.17E-02	8.73E-02
Endosulfan II	1.19E-04	2.85E-04	4.04E-04
Endrin	1.28E-03	3.08E-03	4.36E-03
Alpha-chlordane	6.18E-05	1.49E-04	2.10E-04
Gamma-chlordane	8.32E-04	2.00E-03	2.83E-03
Inorganic Analytes			
Aluminum	**2.66E+01**	**2.56E+02**	**2.83E+02**
Antimony	1.05E-01	**1.01E+00**	**1.11E+00**

Table V - 25

SHORT-TAILED SHREW MAXIMUM HAZARD QUOTIENTS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion Hazard Quotient NOAEL	Maximum Earthworm Ingestion Hazard Quotient NOAEL	Maximum Stressor Hazard Index NOAEL
Arsenic	**1.35E+00**	7.77E-01	**2.12E+00**
Barium	2.57E-01	8.90E-01	**1.15E+00**
Beryllium	1.90E-03	1.83E-02	2.02E-02
Cadmium	9.51E-01	**1.92E+02**	**1.93E+02**
Chromium(III)	5.52E-01	**1.43E+00**	**1.98E+00**
Cobalt	**1.19E+00**	**1.15E+01**	**1.27E+01**
Copper	**2.08E+02**	**7.21E+02**	**9.29E+02**
Iron	**1.48E+03**	**5.42E+03**	**6.90E+03**
Lead	**1.98E+00**	**1.25E+01**	**1.45E+01**
Manganese	**1.87E+00**	**7.19E+00**	**9.06E+00**
Mercury	2.81E-01	**2.59E+00**	**2.87E+00**
Nickel	6.00E-01	**2.36E+00**	**2.96E+00**
Silver	1.11E-01	**1.07E+00**	**1.18E+00**
Thallium	6.66E-02	6.40E-01	7.07E-01
Vanadium	**2.14E+00**	**2.05E+01**	**2.27E+01**
Zinc	7.18E-01	**4.76E+01**	**4.83E+01**

NE - Not evaluated due to lack of ecotoxicological data.

NOAEL - No observed adverse effect level.

Bold numbers indicate a hazard quotient/hazard index greater than one for that SOPC for that medium and/or pathway.

- SOPC presents a potential risk to the shrew.

Table V - 26

AMERICAN ROBIN MAXIMUM HAZARD QUOTIENTS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion Hazard Quotient NOAEL	Maximum Fruit Ingestion Hazard Quotient NOAEL	Maximum Earthworm Ingestion Hazard Quotient NOAEL	Maximum Stressor Hazard Index NOAEL
Volatile Organics				
Acetone	2.13E-07	NE	1.02E-06	1.24E-06
Chloroform	NE	NE	NE	NE
Ethylbenzene	NE	NE	NE	NE
Tetrachloroethene	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
Xylene	2.16E-04	5.24E-04	1.04E-03	1.78E-03
Semivolatile Organics				
Acenaphthene	1.84E-04	2.03E-03	2.65E-04	2.48E-03
Acenaphthylene	9.72E-04	1.32E-03	1.03E-03	3.32E-03
Anthracene	1.22E-03	6.09E-04	2.94E-04	2.13E-03
Benzo(a)anthracene	1.03E-02	1.11E-03	4.93E-03	1.63E-02
Benzo(a)pyrene	9.20E-03	5.38E-04	1.33E-02	2.30E-02
Benzo(b)fluoranthene	1.27E-02	7.46E-04	1.84E-02	3.19E-02
Benzo(g,h,i)perylene	4.21E-03	1.35E-04	4.04E-03	8.38E-03
Benzo(k)fluoranthene	1.29E-02	7.54E-04	1.86E-02	3.22E-02
Carbazole	NE	NE	NE	NE
Chrysene	9.33E-03	9.94E-04	8.97E-03	1.93E-02
Dibenz(a,h)anthracene	1.31E-03	2.87E-05	3.10E-03	4.44E-03
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	1.31E-02	3.60E-03	5.05E-03	2.18E-02
Fluorene	3.29E-04	2.29E-04	3.16E-04	8.73E-04
Indeno(1,2,3-cd)pyrene	4.07E-03	1.33E-04	7.83E-03	1.20E-02
4-Methylphenol	NE	NE	NE	NE
2-Methylnaphthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	3.68E-03	2.60E-01	1.77E-03	2.65E-01
Pyrene	1.97E-02	5.55E-03	8.53E-03	3.38E-02
Pesticides/PCBs				
DDD	4.32E-04	2.10E-05	4.16E-04	8.69E-04
DDE	3.06E-03	5.13E-05	3.68E-03	6.79E-03
DDT	2.52E-03	1.24E-04	3.03E-03	5.67E-03
Endosulfan II	NE	NE	NE	NE
Endrin	NE	NE	NE	NE
Alpha-chlordane	5.61E-03	1.26E-02	6.75E-03	2.50E-02
Gamma-chlordane	5.46E-03	1.23E-02	6.57E-03	2.43E-02
Inorganic Analytes				
Aluminum	**7.03E+02**	**2.20E+00**	**3.38E+03**	**4.09E+03**

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Table V - 26

AMERICAN ROBIN MAXIMUM HAZARD QUOTIENTS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Soil Ingestion Hazard Quotient NOAEL	Maximum Fruit Ingestion Hazard Quotient NOAEL	Maximum Earthworm Ingestion Hazard Quotient NOAEL	Maximum Stressor Hazard Index NOAEL
Antimony	NE	NE	NE	NE
Arsenic	1.99E-01	5.73E-03	5.73E-02	2.62E-01
Barium	**3.36E+01**	**2.43E+00**	**5.82E+01**	**9.43E+01**
Beryllium	NE	NE	NE	NE
Cadmium	1.51E-01	4.36E-02	**1.52E+01**	**1.54E+01**
Chromium(III)	**1.02E+00**	2.21E-02	**1.33E+00**	**2.37E+00**
Cobalt	NE	NE	NE	NE
Copper	**1.90E+00**	**2.47E+00**	**3.29E+00**	**7.65E+00**
Iron	**2.37E+02**	**1.14E+00**	**4.34E+02**	**6.72E+02**
Lead	**4.25E+00**	1.43E-01	**1.35E+01**	**1.79E+01**
Manganese	1.18E-01	2.84E-02	2.27E-01	3.73E-01
Mercury	**7.13E+00**	**1.06E+01**	**3.29E+01**	**5.07E+01**
Nickel	6.49E-03	1.87E-03	1.28E-02	2.12E-02
Silver	NE	NE	NE	NE
Thallium	7.42E-02	1.43E-04	3.57E-01	4.31E-01
Vanadium	NE	NE	NE	NE
Zinc	8.44E-01	1.34E-01	**2.80E+01**	**2.90E+01**

NE - Not evaluated due to lack of data

NOAEL - No observed adverse effect level.

Bold numbers indicate a hazard quotient/hazard index greater than one for that SOPC for that medium and/or pathway.

- SOPC presents a potential risk to the robin.

Table V - 27

AMERICAN KESTREL MAXIMUM HAZARD QUOTIENTS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Shrew Ingestion Hazard Quotient NOAEL	Maximum Robin Ingestion Hazard Quotient NOAEL	Maximum Insect Ingestion Hazard Quotient NOAEL	Maximum Stressor Hazard Index NOAEL
Volatile Organics				
Acetone	4.94E-08	5.47E-08	1.05E-09	1.05E-07
Chloroform	NE	NE	NE	NE
Ethylbenzene	NE	NE	NE	NE
Tetrachloroethene	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
Xylene	5.00E-05	5.54E-05	1.06E-06	1.06E-04
Semivolatile Organics				
Acenaphthene	1.32E-03	4.72E-05	2.72E-07	1.37E-03
Acenaphthylene	2.26E-04	2.50E-04	1.06E-06	4.76E-04
Anthracene	2.84E-04	3.14E-04	3.02E-07	5.98E-04
Benzo(a)anthracene	2.38E-03	2.63E-03	5.06E-06	5.01E-03
Benzo(a)pyrene	2.13E-03	2.36E-03	1.36E-05	4.51E-03
Benzo(b)fluoranthene	2.96E-03	3.27E-03	1.89E-05	6.25E-03
Benzo(g,h,i)perylene	9.76E-04	1.08E-03	4.15E-06	2.06E-03
Benzo(k)fluoranthene	2.99E-03	3.31E-03	1.91E-05	6.31E-03
Carbazole	NE	NE	NE	NE
Chrysene	2.16E-03	2.39E-03	9.21E-06	4.57E-03
Dibenz(a,h)anthracene	3.05E-04	3.37E-04	3.18E-06	6.45E-04
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	3.05E-03	3.37E-03	5.19E-06	6.43E-03
Fluorene	7.62E-05	8.43E-05	3.24E-07	1.61E-04
Indeno(1,2,3-cd)pyrene	9.45E-04	1.05E-03	8.04E-06	2.00E-03
4-Methylphenol	NE	NE	NE	NE
2-Methylnaphthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	1.02E-02	9.44E-04	1.82E-06	1.12E-02
Pyrene	4.57E-03	5.06E-03	8.76E-06	9.64E-03
Pesticides/PCBs				
DDD	1.00E-04	1.22E-03	4.27E-07	1.32E-03
DDE	7.10E-04	8.65E-03	3.78E-06	9.36E-03
DDT	5.84E-04	7.11E-03	3.11E-06	7.70E-03
Endosulfan II	NE	NE	NE	NE
Endrin	NE	NE	NE	NE
Alpha-chlordane	1.30E-03	1.44E-03	6.93E-06	2.75E-03
Gamma-chlordane	1.27E-03	1.40E-03	6.74E-06	2.68E-03
Inorganic Analytes				
Aluminum	**1.63E+02**	**1.80E+02**	**3.47E+00**	**3.47E+02**

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Table V - 27

AMERICAN KESTREL MAXIMUM HAZARD QUOTIENTS, PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Maximum Shrew Ingestion Hazard Quotient NOAEL	Maximum Robin Ingestion Hazard Quotient NOAEL	Maximum Insect Ingestion Hazard Quotient NOAEL	Maximum Stressor Hazard Index NOAEL
Antimony	NE	NE	NE	NE
Arsenic	4.61E-02	5.10E-02	5.89E-05	9.72E-02
Barium	**7.81E+00**	**8.64E+00**	5.98E-02	**1.65E+01**
Beryllium	NE	NE	NE	NE
Cadmium	1.58E-02	1.16E-03	1.57E-02	3.26E-02
Chromium(III)	2.37E-01	2.62E-01	1.36E-03	5.00E-01
Cobalt	NE	NE	NE	NE
Copper	1.41E-01	2.93E-02	3.38E-03	1.74E-01
Iron	**5.51E+01**	**6.09E+01**	4.45E-01	**1.16E+02**
Lead	9.85E-02	2.62E-01	1.38E-02	3.74E-01
Manganese	2.74E-02	3.03E-02	2.33E-04	5.79E-02
Mercury	**6.59E+00**	**7.29E+00**	1.35E-01	**1.40E+01**
Nickel	1.51E-03	1.67E-03	1.31E-05	3.18E-03
Silver	NE	NE	NE	NE
Thallium	1.72E-02	1.90E-02	3.66E-04	3.66E-02
Vanadium	NE	NE	NE	NE
Zinc	4.89E-02	2.81E-03	2.87E-02	8.05E-02

NE - Not evaluated due to lack of data

NOAEL - No observed adverse effect level.

Bold numbers indicate a hazard quotient/hazard index greater than one for that SOPC for that medium and/or pathway.

- SOPC presents a potential risk to the kestrel.

Table V - 28

STRESSOR-SPECIFIC RISK-BASED SOIL CONCENTRATIONS FOR UNDEVELOPED LANDFILL MEASUREMENT SPECIES, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Short-Tailed Shrew Stressor-Specific RBSC (NOAEL)	American Robin Stressor-Specific RBSC (NOAEL)	American Kestrel Stressor-Specific RBSC (NOAEL)
Volatile Organics			
Acetone	2.72E+02	1.70E+04	2.00E+05
Chloroform	2.72E+02	NE	NE
Ethylbenzene	1.11E+02	NE	NE
Tetrachloroethene	5.43E+01	NE	NE
Toluene	7.07E+01	NE	NE
Xylene	2.72E+03	1.63E+03	2.72E+04
Semivolatile Organics			
Acenaphthene	1.30E+03	5.64E+01	1.02E+02
Acenaphthylene	NE	2.23E+02	1.55E+03
Anthracene	1.95E+04	4.38E+02	1.56E+03
Benzo(a)anthracene	2.21E+03	4.79E+02	1.56E+03
Benzo(a)pyrene	3.71E+00	3.04E+02	1.55E+03
Benzo(b)fluoranthene	NE	3.04E+02	1.55E+03
Benzo(g,h,i)perylene	NE	3.82E+02	1.55E+03
Benzo(k)fluoranthene	NE	3.04E+02	1.55E+03
Carbazole	NE	NE	NE
Chrysene	NE	3.68E+02	1.55E+03
Dibenz(a,h)anthracene	NE	2.25E+02	1.55E+03
Dibenzofuran	NE	NE	NE
Diethylphthalate	NE	NE	NE
Di-N-butylphthalate	3.40E+02	NE	NE
Di-N-octylphthalate	NE	NE	NE
Fluoranthene	2.04E+03	4.59E+02	1.56E+03
Fluorene	1.23E+03	2.86E+02	1.55E+03
Indeno(1,2,3-cd)pyrene	NE	2.57E+02	1.55E+03
4-Methylphenol	NE	NE	NE
2-Methylnaphthalene	1.61E+02	NE	NE
Naphthalene	3.92E+02	NE	NE
Phenanthrene	1.03E+02	1.05E+01	2.50E+02
Pyrene	1.16E+03	4.44E+02	1.56E+03
Pesticides/PCBs			
DDD	4.22E+03	3.59E+01	2.36E+01
DDE	1.02E+01	3.31E+00	2.40E+00
DDT	2.97E-01	4.57E+00	3.36E+00
Endosulfan II	4.24E+01	NE	NE
Endrin	2.12E+00	NE	NE
Alpha-chlordane	7.03E+01	5.93E-01	5.38E+00

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Table V - 28

STRESSOR-SPECIFIC RISK-BASED SOIL CONCENTRATIONS FOR UNDEVELOPED LANDFILL MEASUREMENT SPECIES, PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Short-Tailed Shrew Stressor-Specific RBSC (NOAEL)	American Robin Stressor-Specific RBSC (NOAEL)	American Kestrel Stressor-Specific RBSC (NOAEL)
Gamma-chlordane	5.08E+00	5.93E-01	5.38E+00
Inorganic Analytes			
Aluminum	5.16E+01	3.57E+00	4.20E+01
Antimony	1.43E+01	NE	NE
Arsenic	1.28E+01	1.04E+02	2.80E+02
Barium	9.05E+02	1.10E+01	6.29E+01
Beryllium	8.42E+01	NE	NE
Cadmium	2.49E-02	3.11E-01	1.47E+02
Chromium(III)	4.57E+01	3.83E+01	1.81E+02
Cobalt	1.36E+00	NE	NE
Copper	2.72E+00	3.29E+02	1.45E+04
Iron	1.90E+01	1.95E+02	1.12E+03
Lead	1.53E+02	1.24E+02	5.95E+03
Manganese	1.04E+02	2.53E+03	1.63E+04
Mercury	1.18E+00	6.71E-02	2.43E-01
Nickel	2.92E+01	4.09E+03	2.72E+04
Silver	4.92E+00	NE	NE
Thallium	6.79E-01	1.11E+00	1.31E+01
Vanadium	1.36E+00	NE	NE
Zinc	6.85E+01	1.14E+02	4.12E+04

NE - Not evaluated due to lack of data

NOAEL - No observed adverse effect level.

RBSC - Risk-based soil concentration

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Table V-29

DATA QUALIFIERS AND DEFINITIONS FOR THE RRII INVESTIGATION AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Qualifier	Definition
B[a]	Concentration in sample is greater than 10 times the concentration in any blank for common laboratory contaminants or greater than five times the concentration in any blank for other contaminants.
J, JL, JK, JH, JT[a]	Sample concentration is an estimate of the actual value.
JB[b]	Concentration in sample is less than 10 times the concentration found in any blank for common laboratory contaminants or less than five times the concentration in any blank for other contaminants. Concentration is greater than the instrument detection limit and is an estimate.
R[b]	Sample concentration results were rejected by the laboratory due to preparation or analysis difficulties.
U, UJ, UJL, UJK, UJH, UJT[a]	Sample concentration is below the instrument detection limit. Value is divided by two for use in the risk assessment.
UJB[b]	Concentration in sample is less than 10 times the concentration found in any blank for common laboratory contaminants or less than five times the concentration in any blank for other contaminants. Concentration is below the instrument detection limit and is an estimate.
*[b]	Result not recommended for use due to associated QA/QC performance inferior to that from other analyses.
T[b]	Identification is questionable due to absence of other commonly coexisting pesticides.

Key:

(a) =Data used in the risk assessment.
(b) =Data not used in the risk assessment.

Source: Ecology and Environment, Inc., (1995).

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Table V - 30

SUMMARY STATISTICS FOR SURFACE SOIL ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Median Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
Volatile Organics							
Acetone	3/52	5.7	0.009	0.014	NA	NA	NA
1,1-Dichloroethene	7/52	13.4	0.001	0.007	NA	NA	NA
1,2-Dichloroethene (total)	3/52	5.7	0.002	0.005	NA	NA	NA
Methylene Chloride	20/51	39.2	0.002	0.068	NA	NA	NA
Tetrachloroethene [a]	2/52	3.8	0.002	0.002	NA	NA	NA
Toluene	18/52	34.6	0.002	0.056	NA	NA	NA
1,1,1-Trichloroethane	13/52	25	0.001	0.005	NA	NA	NA
Xylene	6/52	11.5	0.002	0.006	NA	NA	NA
Semivolatile Organics							
Acenaphthene	28/52	53.8	0.021	0.81	NA	NA	NA
Acenaphthylene	24/52	46.1	0.02	2.7	NA	NA	NA
Anthracene	40/52	76.9	0.029	3	NA	NA	NA
Benzo(a)anthracene	50/52	96.1	0.024	21	NA	NA	NA
Benzo(a)pyrene	50/52	96.1	0.022	20	NA	NA	NA
Benzo(b)fluoranthene	49/52	94.2	0.028	30	NA	NA	NA
Benzo(g,h,i)perylene	51/52	98	0.024	13	NA	NA	NA
Benzo(k)fluoranthene	30/52	57.6	0.023	19	NA	NA	NA
bis(2-ethylhexyl)phthalate	17/50	34	0.075	3.1	NA	NA	NA
Bromethane [a]	1/52	1.9	0.096	0.096	NA	NA	NA
Butylbenzylphthalate	14/52	26.9	0.035	0.96	NA	NA	NA
Carbazole	36/52	69.2	0.019	1.1	NA	NA	NA
Carbon Disulfide [a]	1/52	1.9	0.006	0.006	NA	NA	NA
Chloromethane [a]	1/52	1.9	0.011	0.011	NA	NA	NA
4-Chloro-3-methylphenol [a]	1/52	1.9	0.032	0.032	NA	NA	NA
2-Chlorophenol [a]	1/52	1.9	0.029	0.029	NA	NA	NA
Chrysene	52/52	100	0.025	21	NA	NA	NA
1,4-Dichlorobenzene [a]	1/52	1.9	0.17	0.17	NA	NA	NA
Di-N-butylphthalate	21/52	40.3	0.026	1.1	NA	NA	NA
Di-N-octylphthalate	12/52	23	0.018	0.13	NA	NA	NA
Dibenz(a,h)anthracene	14/52	26.9	0.05	7.6	NA	NA	NA
Dibenzofuran	22/52	42.3	0.018	0.47	NA	NA	NA
Diethylphthalate	7/52	13.4	0.021	0.12	NA	NA	NA
Fluoranthene	51/52	98	0.028	16	NA	NA	NA
Fluorene	29/52	55.7	0.019	0.78	NA	NA	NA
Indeno(1,2,3-cd)pyrene	50/52	96.1	0.029	14	NA	NA	NA
2-Methylnaphthalene	22/52	42.3	0.02	0.19	NA	NA	NA

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Table V - 30

SUMMARY STATISTICS FOR SURFACE SOIL ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Median Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
4-Methylphenol [a]	1/52	1.9	0.021	0.021	NA	NA	NA
Naphthalene	29/52	55.7	0.02	0.39	NA	NA	NA
Phenanthrene	46/52	88.4	0.033	6.9	NA	NA	NA
Pyrene	50/52	96.1	0.032	34	NA	NA	NA
Pesticides/PCBs							
Aldrin	12/52	23	0.00176	0.00886	NA	NA	NA
alpha-BHC	3/52	5.7	0.001	0.00575	NA	NA	NA
Alpha-chlordane	45/52	86.5	0.00182	1.3	NA	NA	NA
Arochlor-1254	6/52	11.5	0.045	1.9	NA	NA	NA
Arochlor-1260	7/52	13.4	0.07	0.74	NA	NA	NA
beta-BHC	5/52	9.6	0.00313	0.0266	NA	NA	NA
4,4'-DDD	37/52	71.1	0.00433	18	NA	NA	NA
4,4'-DDE	40/52	76.9	0.00471	0.82	NA	NA	NA
4,4'-DDT	44/52	84.6	0.00552	1.2	NA	NA	NA
delta-BHC	6/52	11.5	0.00219	0.0069	NA	NA	NA
Dieldrin	28/52	53.8	0.00489	2.4	NA	NA	NA
Endosulfan-II	23/52	44.2	0.00447	0.37	NA	NA	NA
Endosulfan-sulfate	9/52	17.3	0.0041	0.026	NA	NA	NA
Endrin	34/52	65.3	0.00401	0.54	NA	NA	NA
Endrin-aldehyde	37/52	71.1	0.0055	1.1	NA	NA	NA
Endrin-Ketone	13/52	25	0.00428	0.23	NA	NA	NA
gamma-BHC	5/52	9.6	0.00251	0.00386	NA	NA	NA
Gamma-chlordane	42/52	80.7	0.00128	0.11	NA	NA	NA
Heptachlor	18/52	34.6	0.0024	0.0098	NA	NA	NA
Heptachlor-Epoxide	21/52	40.3	0.00192	0.0525	NA	NA	NA
Methoxychlor	7/52	13.4	0.026	0.66	NA	NA	NA
Dioxins/Furans							
1234678-HpCDD	29/36	80.5	0.000041	0.011	NA	NA	NA
1234678-HpCDF	26/36	72.2	0.000007	0.0019	NA	NA	NA
123478-HxCDD	6/36	16.6	0.000003	0.0000754	NA	NA	NA
123478-HxCDF	8/36	22.2	0.0000005	0.00021	NA	NA	NA
1234789-HpCDF	13/36	36.1	0.0000003	0.00011	NA	NA	NA
123678-HxCDD	5/36	13.8	0.0000078	0.00011	NA	NA	NA
123678-HxCDF	8/36	22.2	0.0000007	0.00015	NA	NA	NA
12378-PeCDD	5/36	13.8	0.000006	0.00002	NA	NA	NA
12378-PeCDF	3/36	8.3	0.000002	0.0000197	NA	NA	NA
123789-HxCDD	5/36	13.8	0.000046	0.0014	NA	NA	NA

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Table V - 30

SUMMARY STATISTICS FOR SURFACE SOIL ON THE UNDEVELOPED LANDFILL AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Median Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
123789-HxCDF	3/36	8.3	0.000001	0.0000027	NA	NA	NA
234678-HxCDF	11/36	30.5	0.0000005	0.0001	NA	NA	NA
23478-PeCDF	4/36	11.1	0.0000025	0.000018	NA	NA	NA
2378-TCDD	2/36	5.5	0.00001	0.00003	NA	NA	NA
2378-TCDF	7/36	19.4	0.0000065	0.0000576	NA	NA	NA
OCDD	34/36	94.4	0.0006	0.099	NA	NA	NA
OCDF	16/36	44.4	0.000044	0.001	NA	NA	NA
Inorganics							
Aluminum	52/52	100	1,992	**18,896**	11164.5	11/52	21.2
Antimony	24/49	48.9	3.76	**87.5**	ND	NA	NA
Arsenic	52/52	100	1.7	**110**	6.2	48/52	92.3
Barium	52/52	100	80.1	**1,682**	230.5	46/52	88.5
Beryllium	22/52	42.3	0.15	**1.3**	0.695	6/22	27.3
Cadmium	46/52	88.4	0.67	**23.9**	0.55	45/46	97.8
Calcium	52/52	100	5,811	**75,610**	10225.5	43/52	82.7
Chromium	52/52	100	7.1	**183**	16.95	45/52	86.5
Cobalt	52/52	100	2.7	**37.1**	8.25	36/52	69.2
Copper	52/52	100	12.2	**33,660**	25.55	49/52	94.2
Cyanide	32/52	61.5	0.19	**5.1**	ND	NA	NA
Iron	52/52	100	3,908	**242,691**	15509	45/52	86.5
Lead	52/52	100	37.6	**4,459**	42.35	49/52	94.2
Magnesium	52/52	100	1,030	**5,069**	3687	3/52	5.77
Manganese	52/52	100	127	**4,889**	297	39/52	75
Mercury	47/52	90.3	0.15	**3.3**	0.075	47/47	100
Nickel	51/52	98	7	**227**	17.75	45/51	88.2
Potassium	52/52	100	333	**4,740**	1576.5	17/52	32.7
Selenium	26/52	50	0.21	**7.9**	0.43	13/26	50
Silver	35/52	67.3	0.34	**115**	0.505	32/35	91.4
Sodium	52/52	100	50.8	**1,320**	130	34/52	65.4
Thallium	7/44	15.9	0.55	**21.61**	0.21	7/7	100
Vanadium	51/52	98	6.6	**50.342**	27.55	17/51	33.3
Zinc	52/52	100	60.1	**10,256**	112	48/52	92.3

a - Chemicals were eliminated from further review based on frequency of detection (FOD) screening.

NA - Not applicable.

ND - Not detected.

Bold, shaded numbers represent an exceedance of median background concentrations.

- Analyte was included in the next screening step.

001160.1180

Table V - 31

SUMMARY STATISTICS FOR FLORIDA AVENUE CANAL SURFACE WATER AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
Volatile Organics							
Chloroform	1/1	100	NA	2.7	NA	NA	NA
Inorganics							
Aluminum [a]	1/1	100	NA	124	160	0/1	0
Arsenic	1/1	100	NA	**3.9**	2.4	1/1	100
Barium [a]	1/1	100	NA	58	65	0/1	0
Calcium [b]	1/1	100	NA	37,100	35,000	1/1	100
Iron [a]	1/1	100	NA	538	618	0/1	0
Lead	1/1	100	NA	**7.2**	6.6	1/1	100
Magnesium [b]	1/1	100	NA	15,000	19,200	0/1	0
Manganese [a]	1/1	100	NA	93	135	0/1	0
Potassium [b]	1/1	100	NA	5,090	6,590	0/1	0
Sodium [b]	1/1	100	NA	94,500	169,000	0/1	0
Zinc [a]	1/1	100	NA	27	27	0/1	0

a - Eliminated from the ERA based on comparison to mean upgradient concentrations.

b - Eliminated from the ERA because the analyte is an essential nutrient.

NA - Not applicable.

Bold, shaded numbers represent an exceedance of mean background concentrations.

- Analyte was included in the next screening step.

001160.1182

Table V - 32

SUMMARY STATISTICS FOR FLORIDA AVENUE CANAL SEDIMENT
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
Volatile Organics							
Methylene Chloride	1/1	100	NA	0.001	NA	NA	NA
Tetrachloroethene	1/1	100	NA	0.011	NA	NA	NA
Toluene	1/1	100	NA	0.001	NA	NA	NA
Trichloroethene	1/1	100	NA	0.002	NA	NA	NA
Xylene	1/1	100	NA	0.02	NA	NA	NA
Semivolatile Organics							
Benzo(a)anthracene	1/1	100	NA	0.2	NA	NA	NA
Benzo(a)pyrene	1/1	100	NA	0.2	NA	NA	NA
Benzo(b)fluoranthene	1/1	100	NA	0.17	NA	NA	NA
Benzo(g,h,i)perylene	1/1	100	NA	0.15	NA	NA	NA
Benzo(k)fluoranthene	1/1	100	NA	0.22	NA	NA	NA
Butylbenzylphthalate	1/1	100	NA	0.13	NA	NA	NA
Carbon Disulfide	1/1	100	NA	0.002	NA	NA	NA
Chloromethane	1/1	100	NA	0.01	NA	NA	NA
Chrysene	1/1	100	NA	0.27	NA	NA	NA
Di-N-octylphthalate	1/1	100	NA	0.048	NA	NA	NA
Ethylbenzene	1/1	100	NA	0.002	NA	NA	NA
Fluoranthene	1/1	100	NA	0.56	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1/1	100	NA	0.12	NA	NA	NA
Phenanthrene	1/1	100	NA	0.18	NA	NA	NA
Pyrene	1/1	100	NA	0.5	NA	NA	NA
Pesticides/PCBs							
Aldrin	1/1	100	NA	0.00232	NA	NA	NA
Alpha-chlordane	1/1	100	NA	0.0159	NA	NA	NA
4,4'-DDE	1/1	100	NA	0.00419	NA	NA	NA
Dieldrin	1/1	100	NA	0.000907	NA	NA	NA
Endrin	1/1	100	NA	0.00539	NA	NA	NA
Endrin-aldehyde	1/1	100	NA	0.0105	NA	NA	NA
Gamma-chlordane	1/1	100	NA	0.0227	NA	NA	NA
Inorganics							
Aluminum [a]	1/1	100	NA	964	2,720	0/1	0
Arsenic [a]	1/1	100	NA	3.2	4.85	0/1	0
Barium [a]	1/1	100	NA	58	144	0/1	0
Beryllium [a]	1/1	100	NA	0.09	0.18	0/1	0
Cadmium	1/1	100	NA	1.3	ND	NA	NA

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Table V - 32

SUMMARY STATISTICS FOR FLORIDA AVENUE CANAL SEDIMENT
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
Calcium [b]	1/1	100	NA	28,475	47,300	0/1	0
Chromium [a]	1/1	100	NA	5.3	13.2	0/1	0
Cobalt [a]	1/1	100	NA	2	4.3	0/1	0
Copper	1/1	100	NA	**63.8**	37.5	1/1	100
Iron [a]	1/1	100	NA	4,951	9,310	0/1	0
Lead	1/1	100	NA	**302**	290	1/1	100
Magnesium [b]	1/1	100	NA	1,806	3,870	0/1	0
Manganese	1/1	100	NA	**113**	95	1/1	100
Nickel [a]	1/1	100	NA	3	13.1	0/1	0
Sodium [b]	1/1	100	NA	231	345	0/1	0
Vanadium [a]	1/1	100	NA	3.1	6.95	0/1	0
Zinc [a]	1/1	100	NA	296	327	0/1	0

a - Eliminated from the ERA based on comparison to mean upgradient concentrations.

b - Eliminated from the ERA because the analyte is an essential nutrient.

NA - Not applicable.

ND - Not detected.

Bold numbers represent an exceedance of mean background concentrations.

- Analyte was included in the next screening step.

001160.1185

Table V - 33

SUMMARY STATISTICS FOR PEOPLES AVENUE CANAL SURFACE WATER
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
Volatile Organics							
Chloroform	2/2	100	2	2.1	NA	NA	NA
Inorganics							
Aluminum [a]	2/2	100	110	164	176	0/2	0
Barium [a]	2/2	100	74	95	100	0/2	0
Calcium [b]	2/2	100	39,400	40,800	34,200	2/2	100
Iron	2/2	100	838	**961**	890	1/2	50
Lead [a]	2/2	100	4.1	4.4	7.35	0/2	0
Magnesium [b]	2/2	100	13,100	13,400	12,500	2/2	100
Manganese [a]	2/2	100	125	163	183	0/2	0
Potassium [b]	2/2	100	4,320	4,330	4,550	0/2	0
Sodium [b]	2/2	100	78,300	128,000	166,000	0/2	0

a - Eliminated from the ERA based on comparison to mean upgradient concentrations.

b - Eliminated from the ERA because the analyte is an essential nutrient.

NA - Not applicable.

Bold numbers represent an exceedance of mean background concentrations.

- Analyte was included in the next screening step.

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SUMMARY STATISTICS FOR PEOPLES AVENUE CANAL SEDIMENT
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
Volatile Organics							
1,1,2,2-Tetrachloroethane	1/2	50	0.0005	0.0005	NA	NA	NA
Toluene	2/2	100	0.002	0.01	NA	NA	NA
Xylene	1/2	50	0.005	0.005	NA	NA	NA
Semivolatile Organics							
Acenaphthene	2/2	100	0.086	0.12	NA	NA	NA
Anthracene	2/2	100	0.13	0.22	NA	NA	NA
Benzo(a)anthracene	2/2	100	0.58	0.89	NA	NA	NA
Benzo(a)pyrene	2/2	100	0.44	0.88	NA	NA	NA
Benzo(b)fluoranthene	2/2	100	0.81	0.97	NA	NA	NA
Benzo(g,h,i)perylene	2/2	100	0.44	0.71	NA	NA	NA
Benzo(k)fluoranthene	1/2	50	0.86	0.86	NA	NA	NA
bis(2-ethylhexyl)phthalate	2/2	100	2.9	5.3	NA	NA	NA
2-Butanone	1/2	50	0.033	0.033	NA	NA	NA
Butylbenzylphthalate	2/2	100	0.29	0.31	NA	NA	NA
Carbazole	2/2	100	0.099	0.21	NA	NA	NA
Carbon Disulfide	1/2	50	0.002	0.002	NA	NA	NA
Chloromethane	1/2	50	0.006	0.006	NA	NA	NA
Chrysene	2/2	100	0.67	1.3	NA	NA	NA
Di-N-butylphthalate	2/2	100	0.048	0.15	NA	NA	NA
Di-N-octylphthalate	2/2	100	0.087	0.28	NA	NA	NA
Dibenzofuran	1/2	50	0.04	0.04	NA	NA	NA
Fluoranthene	2/2	100	1.2	2.4	NA	NA	NA
Fluorene	1/2	50	0.087	0.087	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2/2	100	0.36	0.56	NA	NA	NA
2-Methylnaphthalene	2/2	100	0.041	0.11	NA	NA	NA
4-Methylphenol	1/2	50	0.059	0.059	NA	NA	NA
Phenanthrene	2/2	100	0.6	1.1	NA	NA	NA
Pyrene	2/2	100	1.2	2.1	NA	NA	NA
Pesticides/PCBs							
Aldrin	2/2	100	0.005	0.00512	NA	NA	NA
Alpha-chlordane	2/2	100	0.046	0.048	NA	NA	NA

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SUMMARY STATISTICS FOR PEOPLES AVENUE CANAL SEDIMENT
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
4,4'-DDD	2/2	100	0.0111	0.0114	NA	NA	NA
4,4'-DDE	2/2	100	0.0099	0.0112	NA	NA	NA
4,4'-DDT	2/2	100	0.00592	0.0148	NA	NA	NA
Dieldrin	2/2	100	0.0179	0.022	NA	NA	NA
Endosulfan-II	1/2	50	0.00848	0.00848	NA	NA	NA
Endrin	2/2	100	0.0113	0.02	NA	NA	NA
Endrin-aldehyde	2/2	100	0.00502	0.037	NA	NA	NA
Gamma-chlordane	2/2	100	0.062	0.064	NA	NA	NA
Heptachlor	2/2	100	0.00387	0.00567	NA	NA	NA
Heptachlor-epoxide	2/2	100	0.00502	0.00548	NA	NA	NA
Dioxins/Furans							
1234678-HpCDD	1/2	50	0.0008	0.0008	NA	NA	NA
1234678-HpCDF	1/2	50	0.0001	0.0001	NA	NA	NA
1234789-HpCDF	1/2	50	0.0000038	0.0000038	NA	NA	NA
123678-HxCDD	2/2	100	0.0000082	0.0000594	NA	NA	NA
123678-HxCDF	1/2	50	0.0000051	0.0000051	NA	NA	NA
123789-HxCDD	1/2	50	0.0000066	0.0000066	NA	NA	NA
234678-HxCDF	1/2	50	0.0000059	0.0000059	NA	NA	NA
OCDD	2/2	100	0.0029	0.0088	NA	NA	NA
OCDF	2/2	100	0.000077	0.0001	NA	NA	NA
Inorganics							
Aluminum [a]	2/2	100	2,542	3,963	9,050	0/2	0
Arsenic [a]	2/2	100	3.5	4.1	10.6	0/2	0
Barium [a]	2/2	100	223	388	899	0/2	0
Beryllium [a]	2/2	100	0.16	0.32	0.645	0/2	0
Cadmium [a]	1/2	50	1.2	1.2	3.25	0/1	0
Calcium [b]	2/2	100	29,116	78,856	32,000	1/2	50
Chromium [a]	2/2	100	12	17.5	28.1	0/2	0
Cobalt [a]	2/2	100	3.5	5.2	7.4	0/2	0
Copper [a]	2/2	100	21.7	55.6	89	0/2	0
Iron [a]	2/2	100	10,010	10,212	17,500	0/2	0
Lead	2/2	100	199	**481**	278	1/2	50

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SUMMARY STATISTICS FOR PEOPLES AVENUE CANAL SEDIMENT
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Frequency of Detection	Percent Detected	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean Background Concentration (mg/kg)	Frequency of Exceedance of Background	Percent Exceeding Background
Magnesium [b]	2/2	100	2,452	3,279	4,270	0/2	0
Manganese [a]	2/2	100	139	214	274	0/2	0
Mercury	2/2	100	0.14	**0.38**	0.375	1/2	50
Nickel [a]	2/2	100	13.6	17	23.3	0/2	0
Potassium [b]	2/2	100	399	689	1,390	0/2	0
Silver [a]	1/2	50	0.92	0.92	ND	NA	0
Sodium [b]	2/2	100	503	587	1,130	0/2	0
Vanadium [a]	2/2	100	6.9	11.8	25.1	0/2	0
Zinc [a]	2/2	100	206	336	579	0/2	0

a - Eliminated from the ERA based on comparison to mean upgradient concentrations.

b - Eliminated from the ERA because the analyte is an essential nutrient.

NA - Not applicable.

ND - Not detected.

Bold, shaded numbers represent an exceedance of mean background concentrations.

- Analyte was included in the next screening step.

001160.1191

Table V - 35

COMPARISON OF RRII MAXIMUM UNDEVELOPED LANDFILL SURFACE SOIL STRESSORS TO RISK-BASED SOIL CONCENTRATIONS CALCULATED DURING THE PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Stressor Concentrations	Soil Invertebrate RBSC (mg/kg)	Vegetation RBSC (mg/kg)	Short-Tailed Shrew RBSC (mg/kg)	American Robin RBSC (mg/kg)	American Kestrel RBSC (mg/kg)
Volatile Organics						
Acetone	1.40E-02	NE	NE	2.72E+02	1.70E+04	2.00E+05
1,1-Dichloroethene	7.00E-03	NE	NE	NE	NE	NE
1,2-Dichloroethene (total)	5.00E-03	NE	NE	NE	NE	NE
Methylene Chloride	6.80E-02	NE	NE	NE	NE	NE
Toluene	5.60E-02	NE	NE	7.07E+01	NE	NE
1,1,1-Trichloroethane	5.00E-03	NE	NE	NE	NE	NE
Xylene	6.00E-03	NE	NE	2.72E+03	1.63E+03	2.72E+04
Semi-Volatile Organics						
Acenaphthene	8.10E-01	NE	NE	1.30E+03	5.64E+01	1.02E+02
Acenaphthylene	2.70E+00	NE	NE	NE	NE	1.55E+03
Anthracene	3.00E+00	NE	NE	1.95E+04	4.38E+02	1.56E+03
Benzo(a)anthracene	2.10E+01	NE	NE	2.21E+03	4.79E+02	1.56E+03
Benzo(a)pyrene	2.00E+01	NE	NE	**3.71E+00**	3.04E+02	1.55E+03
Benzo(b)fluoranthene	3.00E+01	NE	NE	NE	3.04E+02	1.55E+03
Benzo(g,h,i)perylene	1.30E+01	NE	NE	NE	3.82E+02	1.55E+03
Benzo(k)fluoranthene	1.90E+01	NE	NE	NE	3.04E+02	1.55E+03
bis(2-ethylhexyl)phthalate	3.10E+00	NE	NE	NE	NE	NE
Butylbenzylphthalate	9.60E-01	NE	NE	NE	NE	NE
Carbazole	1.10E+00	NE	NE	NE	NE	NE
Chrysene	2.10E+01	NE	NE	NE	3.68E+02	1.55E+03
Di-N-butylphthalate	1.10E+00	NE	2.00E+03	3.40E+02	NE	NE
Di-N-octylphthalate	1.30E-01	NE	NE	NE	NE	NE
Dibenz(a,h)anthracene	7.60E+00	NE	NE	NE	2.25E+02	1.55E+03
Dibenzofuran	4.70E-01	NE	NE	NE	NE	NE
Diethylphthalate	✓ 1.20E-01	NE	NE	NE	NE	NE
Fluoranthene	1.60E+01	NE	NE	2.04E+03	4.59E+02	1.56E+03
Fluorene	7.80E-01	1.73E+02	NE	1.23E+03	2.86E+02	1.55E+03
Indeno(1,2,3-cd)pyrene	1.40E+01	NE	NE	NE	2.57E+02	1.55E+03
2-Methylnaphthalene	2.10E-02	NE	NE	1.61E+02	NE	NE
Naphthalene	3.90E-01	NE	NE	3.92E+02	NE	NE

Table V - 35

COMPARISON OF RRII MAXIMUM UNDEVELOPED LANDFILL SURFACE SOIL STRESSORS
TO RISK-BASED SOIL CONCENTRATIONS CALCULATED DURING THE PHASE I ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Stressor Concentrations	Soil Invertebrate RBSC (mg/kg)	Vegetation RBSC (mg/kg)	Short-Tailed Shrew RBSC (mg/kg)	American Robin RBSC (mg/kg)	American Kestrel RBSC (mg/kg)
Phenanthrene	6.90E+00	NE	NE	1.03E+02	1.05E+01	2.50E+02
Pyrene	3.40E+01	NE	NE	1.16E+03	4.44E+02	1.56E+03
Pesticides/PCBs						
Aldrin	8.86E-03	NE	NE	NE	NE	NE
alpha-BHC	5.75E-03	1.25E+01	1.00E+01	NE	NE	NE
Alpha-chlordane	1.30E+00	2.25E+00	1.25E+01	7.03E+01	**5.93E-01**	5.38E+00
Aroclor - 1254	1.90E+00	NE	NE	NE	NE	NE
Aroclor - 1260	7.40E-01	NE	NE	NE	NE	NE
beta-BHC	2.66E-02	1.25E+01	1.00E+01	NE	NE	NE
DDD	1.80E+01	**1.50E+00**	**1.25E+01**	4.22E+03	3.59E+01	2.36E+01
DDE [a]	8.20E-01	1.50E+00	1.25E+01	1.02E+01	3.31E+00	2.40E+00
DDT	1.20E+00	1.25E+01	1.25E+01	**2.97E-01**	4.57E+00	3.36E+00
delta-BHC	6.90E-03	1.25E+01	1.00E+01	NE	NE	NE
Dieldrin	2.40E+00	NE	NE	NE	NE	NE
Endosulfan II	3.70E-01	NE	NE	4.24E+01	NE	NE
Endosulfan-Sulfate	2.60E-02	NE	NE	NE	NE	NE
Endrin	5.40E-01	NE	NE	2.12E+00	NE	NE
Endrin Aldehyde	1.10E+00	NE	NE	NE	NE	NE
Endrin Ketone	2.30E-01	NE	NE	NE	NE	NE
gamma-BHC	3.86E-03	1.25E+01	1.00E+01	NE	NE	NE
Gamma-chlordane [a]	1.10E-01	2.25E+00	1.25E+01	5.08E+00	5.93E-01	5.38E+00
Heptaclor	9.80E-03	1.25E+01	1.25E+01	NE	NE	NE
Heptaclor Epoxide	5.25E-02	1.25E+01	1.25E+01	NE	NE	NE
Methoxyclor	6.60E-01	NE	NE	NE	NE	NE
Dioxins/Furans						
2,3,7,8-TCDD	7.40E-03	**5.20E-05**	NE	NE	NE	NE
Inorganics						
Aluminum	1.89E+04	NE	NE	**5.16E+01**	**3.57E+00**	**4.20E+01**
Antimony	8.75E+01	NE	NE	**1.43E+01**	NE	NE
Arsenic	1.10E+02	NE	**8.00E+00**	**1.28E+01**	**1.04E+02**	2.80E+02
Barium	1.68E+03	NE	NE	**9.05E+02**	**1.10E+01**	**6.29E+01**

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Table V - 35

COMPARISON OF RRII MAXIMUM UNDEVELOPED LANDFILL SURFACE SOIL STRESSORS TO RISK-BASED SOIL CONCENTRATIONS CALCULATED DURING THE PHASE I ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Maximum Surface Soil Stressor Concentrations	Soil Invertebrate RBSC (mg/kg)	Vegetation RBSC (mg/kg)	Short-Tailed Shrew RBSC (mg/kg)	American Robin RBSC (mg/kg)	American Kestrel RBSC (mg/kg)
Beryllium	1.30E+00	NE	**5.00E-01**	8.42E+01	NE	NE
Cadmium	2.39E+01	1.84E+03	**2.50E+00**	**2.49E-02**	**3.11E-01**	1.47E+02
Chromium	1.83E+02	NE	3.20E+02	**4.57E+01**	**3.83E+01**	**1.81E+02**
Cobalt	3.71E+01	3.00E+03	NE	**1.36E+00**	NE	NE
Copper	3.37E+04	**1.31E+02**	**4.20E+01**	**2.72E+00**	**3.29E+02**	**1.45E+04**
Cyanide	5.10E+00	1.00E+02	NE	NE	NE	NE
Iron	2.43E+05	NE	**2.13E+03**	**1.90E+01**	**1.95E+02**	**1.12E+03**
Lead	4.46E+03	**5.00E+02**	**5.00E+01**	**1.53E+02**	**1.24E+02**	5.95E+03
Manganese	4.89E+03	NE	NE	**1.04E+02**	**2.53E+03**	1.63E+04
Mercury	3.40E+00	NE	**3.00E-03**	**1.18E+00**	**6.71E-02**	**2.43E-01**
Nickel	2.27E+02	**2.50E+01**	**1.25E+01**	**2.92E+01**	4.09E+03	2.72E+04
Selenium	7.90E+00	NE	NE	NE	NE	NE
Silver	1.15E+02	NE	NE	**4.92E+00**	NE	NE
Thallium	2.16E+01	NE	NE	**6.79E-01**	**1.11E+00**	**1.31E+01**
Vanadium	5.03E+01	NE	NE	**1.36E+00**	NE	NE
Zinc	1.03E+04	**5.00E+01**	**1.80E+02**	**6.85E+01**	**1.14E+02**	4.12E+04

a - Eliminated from the ERA based on comparison to RBSCs for measurement species and communities.

NE - Not evaluated due to either lack of ecological modeling data or because the SOPC was not evaluated during the Phase I ERA.

Bold, shaded numbers represent an exceedance of a RBSC by the maximum SOPC concentration.

- Analyte was included in the next screening step.

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Table V - 36

COMPARISON OF FLORIDA AVENUE CANAL AND PEOPLES AVENUE CANAL SURFACE WATER CONCENTRATIONS WITH LOUISIANA STATE AMBIENT WATER QUALITY CRITERIA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Louisiana State AWQC		Florida Avenue Canal Maximum Surface Water Concentrations	Peoples Avenue Canal Maximum Surface Water Concentrations
	Acute	Chronic		
Volatile Organics (ug/L)				
Chloroform	2,890	1,445	2.7	2.1
Inorganics (mg/L)				
Arsenic	69	36	3.9	ND
Iron [a]	900	NDA	ND	961
Lead [b]	141	5.5	7.2	ND

Table V - 36

COMPARISON OF FLORIDA AVENUE CANAL AND PEOPLES AVENUE CANAL SURFACE WATER CONCENTRATIONS WITH LOUISIANA STATE AMBIENT WATER QUALITY CRITERIA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Florida Avenue Canal Surface Water Hazard Quotients		Peoples Avenue Canal Surface Water Hazard Quotients	
	Acute	Chronic	Acute	Chronic
Volatile Organics (ug/L)				
Chloroform [c]	0.001	0.002	0.0007	0.0015
Inorganics (mg/L)				
Arsenic [c]	0.057	0.1	NE	NE
Iron	NE	NE	**1.1**	NE
Lead	0.05	**1.3**	NE	NE

a - Acute value is a lethality value for carp (OHM/TADS 1994).

b - Acute and chronic AWQC were calculated using Florida Avenue Canal hardness data.

c - Eliminated from the ERA based on comparison to LA AWQC.

NDA - No criteria available.

ND - Not Detected.

NE - Not evaluated due to non-detected value or lack of applicable criteria.

Bold, shaded numbers indicate a hazard quotient greater than one for that SOPC.

- Contaminant was selected for evaluation in the ERA because it exceeded acute and/or chronic AWQC.

001160.1197

Table V - 37

COMPARISON OF FLORIDA AVENUE CANAL SEDIMENT CONCENTRATIONS WITH ONTARIO SEDIMENT GUIDELINES AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Ontario Sediment Guidelines (mg/kg)		Florida Avenue Canal Maximum Sediment Concentrations (mg/kg)	Florida Avenue Canal Sediment Hazard Quotients	
	Lowest Effect Level	Severe Effect Level		Lowest Effect Level	Severe Effect Level
Volatile Organics (mg/kg)					
Methylene Chloride	NDA	NDA	0.001	NE	NE
Tetrachloroethene	NDA	NDA	0.011	NE	NE
Toluene	NDA	NDA	0.001	NE	NE
Trichloroethene	NDA	NDA	0.002	NE	NE
Xylene	NDA	NDA	0.02	NE	NE
Semivolatile Organics (mg/kg)					
Benzo(a)anthracene [a]	0.32	1480	0.20	0.63	0.0001
Benzo(a)pyrene [a]	0.37	1440	0.20	0.5	0.0001
Benzo(b)fluoranthene	NDA	NDA	0.17	NE	NE
Benzo(g,h,i)perylene [a]	0.17	320	0.15	0.88	0.00047
Benzo(k)fluoranthene [a]	0.24	1340	0.22	0.9	0.00016
Butylbenzylphthalate	NDA	NDA	0.13	NE	NE
Carbon Disulfide	NDA	NDA	0.002	NE	NE
Chloromethanes	NDA	NDA	0.01	NE	NE
Chrysene [a]	0.34	460	0.27	0.79	0.00059
Di-N-octylphthalate	NDA	NDA	0.048	NE	NE
Ethylbenzene	NDA	NDA	0.002	NE	NE
Fluoranthene [a]	0.75	1020	0.56	0.75	0.00055
Indeno(1,2,3-cd)pyrene [a]	0.2	320	0.12	0.6	0.00038
Phenanthrene [a]	0.56	950	0.18	0.3	0.00019
Pyrene [a]	0.49	850	0.5	**1.0**	0.00059
Pesticides/PCBs					
Aldrin	0.002	8	0.002	**1.0**	0.00025
Alpha-chlordane	0.007	6	0.016	**2.29**	0.0027
4,4'-DDE [a]	0.005	19	0.004	0.8	0.0002
Dieldrin [a]	0.002	91	0.0009	0.45	0.00001
Endrin	0.003	130	0.0054	**1.8**	0.00004
Endrin-aldehyde	NDA	NDA	0.01	NE	NE

Table V - 37

COMPARISON OF FLORIDA AVENUE CANAL SEDIMENT CONCENTRATIONS WITH ONTARIO SEDIMENT GUIDELINES AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Ontario Sediment Guidelines (mg/kg)		Florida Avenue Canal Maximum Sediment Concentrations (mg/kg)	Florida Avenue Canal Sediment Hazard Quotients	
	Lowest Effect Level	Severe Effect Level		Lowest Effect Level	Severe Effect Level
Gamma-chlordane	0.007	6	0.02	**2.86**	0.003
Inorganics					
Cadmium	0.6	10	1.3	**2.17**	0.13
Copper	16	110	63.8	**3.99**	0.58
Lead	31	250	302	**9.7**	**1.2**
Manganese [a]	460	1100	113	0.25	0.1

a - Eliminated from the ERA based on comparison to sediment guidelines.

NDA - No sediment guidelines available.

NE - Not evaluated due to lack of sediment guidelines.

Bold, shaded numbers indicate a hazard quotient greater than one for that SOPC.

- Contaminant was selected for evaluation in the ERA because it exceeded Lowest and/or Severe Effects Levels from the Ontario Sediment Guidelines, or because sediment guidelines were unavailable for that stressor.

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Table V - 38

COMPARISON OF PEOPLES AVENUE CANAL SEDIMENT CONCENTRATIONS WITH ONTARIO SEDIMENT GUIDELINES AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Ontario Sediment Guidelines (mg/kg)		Peoples Avenue Canal Maximum Sediment Concentrations (mg/kg)	Peoples Avenue Canal Sediment Hazard Quotients	
	Lowest Effect Level	Severe Effect Level		Lowest Effect Level	Severe Effect Level
Volatile Organics (mg/kg)					
1,1,2,2-Tetrachloroethane	NDA	NDA	0.0005	NE	NE
Toluene	NDA	NDA	0.01	NE	NE
Xylene	NDA	NDA	0.005	NE	NE
Semivolatile Organics (mg/kg)					
Acenaphthene	NDA	NDA	0.12	NE	NE
Anthracene	0.22	370	0.22	**1.0**	0.00059
Benzo(a)anthracene	0.32	1480	0.89	**2.78**	0.0006
Benzo(a)pyrene	0.37	1440	0.88	**2.38**	0.0006
Benzo(b)fluoranthene	NDA	NDA	0.97	NE	NE
Benzo(g,h,i)perylene	0.17	320	0.71	**4.18**	0.002
Benzo(k)fluoranthene	0.24	1340	0.86	**3.58**	0.0006
bis(2-ethylhexyl)phthalate	NDA	NDA	5.3	NE	NE
2-Butanone	NDA	NDA	0.033	NE	NE
Butylbenzylphthalate	NDA	NDA	0.31	NE	NE
Carbazole	NDA	NDA	0.21	NE	NE
Carbon Disulfide	NDA	NDA	0.002	NE	NE
Chloromethane	NDA	NDA	0.006	NE	NE
Chrysene	0.34	460	1.3	**3.8**	0.0028
Di-N-butylphthalate	NDA	NDA	0.15	NE	NE
Di-N-octylphthalate	NDA	NDA	0.28	NE	NE
Dibenzofuran	NDA	NDA	0.04	NE	NE
Fluoranthene	0.75	1020	2.4	**3.2**	0.002
Fluorene [a]	0.19	160	0.087	0.46	0.0005
Indeno(1,2,3-cd)pyrene	0.2	320	0.56	**2.8**	0.0018
2-Methylnaphthalene	NDA	NDA	0.11	NE	NE

Table V - 38

COMPARISON OF PEOPLES AVENUE CANAL SEDIMENT CONCENTRATIONS WITH ONTARIO SEDIMENT GUIDELINES AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Ontario Sediment Guidelines (mg/kg)		Peoples Avenue Canal Maximum Sediment Concentrations (mg/kg)	Peoples Avenue Canal Sediment Hazard Quotients	
	Lowest Effect Level	Severe Effect Level		Lowest Effect Level	Severe Effect Level
4-Methylphenol	NDA	NDA	0.059	NE	NE
Phenanthrene	0.56	950	1.1	**1.96**	0.001
Pyrene	0.49	850	2.1	**4.29**	0.002
Pesticides/PCBs					
Aldrin	0.002	8	0.00512	**2.56**	0.00064
Alpha-chlordane	0.007	6	0.048	**6.86**	0.008
4,4'-DDD	0.008	6	0.0114	**1.4**	0.0019
4,4'-DDE	0.005	19	0.0112	**2.24**	0.00059
4,4'-DDT	0.007	12	0.0148	**2.1**	0.001
Dieldrin	0.002	91	0.022	**11.0**	0.0002
Endosulfan-II	NDA	NDA	0.00848	NE	NE
Endrin	0.003	130	0.02	**6.67**	0.00015
Endrin-aldehyde	NDA	NDA	0.037	NE	NE
Gamma-chlordane	0.007	6	0.064	**9.1**	0.01
Heptachlor	NDA	NDA	0.00567	NE	NE
Heptachlor-epoxide	0.005	5	0.00548	**1.1**	0.001
Dioxins/Furans					
1234678-HpCDD	NDA	NDA	0.000008	NE	NE
1234678-HpCDF	NDA	NDA	0.000001	NE	NE
1234789-HpCDF	NDA	NDA	0.000000038	NE	NE
123678-HxCDD	NDA	NDA	0.0000059	NE	NE
123678-HxCDF	NDA	NDA	0.0000005	NE	NE
123789-HxCDD	NDA	NDA	0.00000066	NE	NE
234678-HxCDF	NDA	NDA	0.00000059	NE	NE
OCDD	NDA	NDA	0.0000088	NE	NE
OCDF	NDA	NDA	0.0000001	NE	NE

Table V - 38

COMPARISON OF PEOPLES AVENUE CANAL SEDIMENT CONCENTRATIONS WITH ONTARIO SEDIMENT GUIDELINES AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Ontario Sediment Guidelines (mg/kg)		Peoples Avenue Canal Maximum Sediment Concentrations (mg/kg)	Peoples Avenue Canal Sediment Hazard Quotients	
	Lowest Effect Level	Severe Effect Level		Lowest Effect Level	Severe Effect Level
2,3,7,8-TCDD [b]	0.00000001	NDA	0.000026	**2,606**	NE
Inorganics					
Lead	31	250	481	**15.5**	**1.9**
Mercury	0.2	2	0.38	**1.9**	0.19

a - Eliminated from the ERA based on comparison to sediment guidelines.

b - Compared to Wisconsin Maximum Allowable Sediment Concentrations (1987) due to unavailability of Ontario Sediment Quality Guidelines.

NDA - No sediment guidelines available.

NE - Not evaluated due to lack of sediment guidelines

Bold, shaded numbers indicate a hazard quotient greater than one for that SOPC.

- Contaminant was selected for evaluation in the ERA because it exceeded Lowest and/or Severe Effects Levels from the Ontario Sediment Guidelines, or because sediment guidelines were unavailable for that stressor.

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UNDEVELOPED LANDFILL SURFACE SOIL STRESSORS SELECTED FOR EVALUATION IN THE PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor
Volatile Organics
Acetone
1,1-Dichloroethene
1,2-Dichloroethene (total)
Methylene chloride
Toluene
1,1,1-Trichloroethane
Xylene
Semivolatile Organics
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
bis(2-ethylhexyl)phthalate
Butylbenzylphthalate
Carbazole
Chrysene
Dibenz(a,h)anthracene
Dibenzofuran
1,4-Dichlorobenzene
Diethylphthalate
Di-N-butylphthalate
Di-N-octylphthalate
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
2-Methylnaphthalene
Napthalene
Phenanthrene
Pyrene
Pesticides/PCBs
DDD
DDT
Aldrin
alpha-BHC
Aroclor - 1254
Aroclor - 1260
beta-BHC
Dieldrin
delta-BHC
Endosulfan II
Endosulfan-Sulfate

Table V - 39

UNDEVELOPED LANDFILL SURFACE SOIL STRESSORS SELECTED FOR EVALUATION IN THE PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor
Endrin
Endrin Aldehyde
Endrin Ketone
gamma-BHC
Heptaclor
Heptaclor Epoxide
Methoxyclor
Dioxins/Furans
2,3,7,8-TCDD
Inorganics
Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium(III)
Cobalt
Copper
Cyanide
Iron
Lead
Manganese
Mercury
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

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FLORIDA AVENUE CANAL AND PEOPLES AVENUE CANAL SEDIMENT STRESSORS SELECTED FOR EVALUATION IN THE PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Florida Avenue Canal	Peoples Avenue Canal
Volatile Organics (mg/kg)	**Volatile Organics (mg/kg)**
Methylene Chloride	1,1,2,2-Tetrachloroethane
Tetrachloroethene	Toluene
Toluene	Xylene
Trichloroethene	**Semivolatile Organics (mg/kg)**
Xylene	Acenaphthene
Semivolatile Organics (mg/kg)	Anthracene
Benzo(b)fluoranthene	Benzo(a)anthracene
Butylbenzylphthalate	Benzo(a)pyrene
Carbon Disulfide	Benzo(b)fluoranthene
Chloromethane	Benzo(g,h,i)perylene
Di-N-octylphthalate	Benzo(k)fluoranthene
Ethylbenzene	bis(2-ethylhexyl)phthalate
Pyrene	2-Butanone
Pesticides/PCBs	Butylbenzylphthalate
Aldrin	Carbazole
Alpha-chlordane	Carbon-disulfide
Endrin	Chloromethane
Endrin-aldehyde	Chrysene
Gamma-chlordane	Di-N-butylphthalate
Inorganics	Di-N-octylphthalate
Cadmium	Dibenzofuran
Copper	Fluoranthene
Lead	Indeno(1,2,3-cd)pyrene
	2-Methylnaphthalene
	4-Methylphenol
	Phenanthrene
	Pyrene
	Pesticides/PCBs
	Aldrin
	Alpha-chlordane
	4,4'-DDD
	4,4'-DDE
	4,4'-DDT
	Dieldrin
	Endosulfan-II
	Endrin
	Endrin-aldehyde
	Gamma-chlordane
	Heptachlor
	Heptachlor-epoxide
	Dioxins/Furans
	1234678-HpCDD
	1234678-HpCDF
	1234789-HpCDF
	123678-HxCDD

Table V - 40

FLORIDA AVENUE CANAL AND PEOPLES AVENUE CANAL SEDIMENT STRESSORS SELECTED FOR EVALUATION IN THE PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Florida Avenue Canal	Peoples Avenue Canal
	123678-HxCDF
	123789-HxCDD
	234678-HxCDF
	OCDD
	OCDF
	2,3,7,8-TCDD
	Inorganics
	Lead
	Mercury

Table V - 41

SUMMARY OF TRANSPORT AND FATE CHARACTERISTICS FOR SURFACE SOIL STRESSORS DETECTED ON THE UNDEVELOPED LANDFILL DURING THE RRII[a], PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Stressor [b]	Surface Soil			
	Adsorption	Wind Erosion	Surface Water runoff	Vertical Migration
Semivolatile Organics				
Bis(2-ethylhexyl)phthalate	low	high	low	high
1,2-Dichloroethene	low	high	low	high
Methylene Chloride	low	high	low	high
Pesticides/PCBs				
Heptachlor	moderate	moderate	low	low
PCBs	high	low	low	low
Dioxins/Furans				
2,3,7,8-TCDD	high	low	low	low
Inorganics				
Copper	high	low	low	low
Iron	high	low	low	low

Table V - 41

SUMMARY OF TRANSPORT AND FATE CHARACTERISTICS FOR SURFACE SOIL STRESSORS DETECTED ON THE UNDEVELOPED LANDFILL DURING THE RRII[a], PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995 [a]

Stressor [b]	Biota Translocation		Transformation			
	Bioaccumulation	Biomagnification	Volatilization	Photolysis	Photo-oxidation	Microbial Metabolism
Semivolatile Organics						
Bis(2-ethylhexyl)phthalate	moderate	low	high	low	high	high
1,2-Dichloroethene	low	low	high	low	high	high
Methylene Chloride	low	low	high	low	high	high
Pesticides/PCBs						
Heptachlor	high	high	moderate	high	--	high
PCBs	high	high	--	--	--	--
Dioxins/Furans						
2,3,7,8-TCDD	high	high	low	low	low	low
Inorganics						
Copper	low	low	NDA	NDA	NDA	NDA
Iron	NDA	NDA	NDA	NDA	NDA	NDA

a - Transport and Fate summaries for each SOPC are presented in Section U.2.2.5.2 of the Phase I ERA.

b - Stressors presented in this summary table represent a subset of the complete list of surface soil stressors selected selected for the Phase I ERA.

NDA - No data available.

Source: Ecology and Environment, Inc., 1994.

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MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE POINT CONCENTRATIONS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)	
	Mean	95% Upper Confidence Limit
Volatile Organics		
Acetone	7.69E-03	9.00E-03
1,1-Dichloroethene	5.40E-03	6.60E-03
1,2-Dichloroethene	6.00E-03	5.00E-03 [a]
Methylene Chloride	7.90E-03	1.26E-02
Toluene	6.10E-03	8.50E-03
1,1,1-Trichloroethane	4.95E-03	5.00E-03 [a]
Xylene	5.90E-03	6.00E-03 [a]
Semivolatile Organics		
Acenaphthene	1.18E-01	2.76E-01
Acenaphthylene	1.27E-01	2.76E-01
Anthracene	1.94E-01	4.16E-01
Benzo(a)anthracene	5.54E-01	2.40E+00
Benzo(a)pyrene	5.55E-01	2.11E+00
Benzo(b)fluoranthene	6.23E-01	2.47E+00
Benzo(g,h,i)perylene	4.56E-01	1.54E+00
Benzo(k)fluoranthene	4.22E-01	1.86E+00
Bis(2-ethylhexyl)phthalate	2.64E-01	3.96E-01
Butylbenzylphthalate	2.11E-01	2.90E-01
Carbazole	1.36E-01	2.60E-01
Chrysene	5.71E-01	2.86E+00
Dibenz(a,h)anthracene	2.38E-01	3.84E-01
Dibenzofuran	1.29E-01	2.62E-01
Diethylphthalate	1.82E-01	1.20E-01 [a]
Di-N-butylphthalate	1.72E-01	3.12E-01
Di-N-octylphthalate	1.46E-01	1.30E-01 [a]
Fluoranthene	7.95E-01	3.89E+00
Fluorene	1.13E-01	2.80E-01
Indeno(1,2,3-cd)pyrene	4.13E-01	1.35E+00
2-Methylnapthalene	1.18E-01	1.90E-01 [a]
Naphthalene	1.05E-01	2.22E-01
Phenanthrene	4.54E-01	1.32E+00
Pyrene	8.37E-01	3.99E+00
Pesticides/PCB		
Aldrin	1.67E-03	3.20E-03
alpha-BHC	1.28E-03	2.00E-03
Aroclor - 1254	3.86E-02	1.70E-01
Aroclor - 1260	4.00E-02	1.41E-01
beta-BHC	1.43E-03	2.70E-03
DDD	1.15E-02	1.08E-01
DDT	2.95E-02	2.27E-01
delta-BHC	1.42E-03	2.45E-03
Dieldrin	6.75E-03	3.10E-02
Endosulfan II	5.20E-03	1.98E-02

Table V - 42

MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE POINT CONCENTRATIONS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)	
	Mean	95% Upper Confidence Limit
Endosulfan Sulfate	3.00E-03	5.88E-03
Endrin	7.90E-03	2.87E-02
Endrin Aldehyde	1.13E-02	4.90E-02
Endrin Ketone	3.98E-03	1.29E-02
Alpha-chlordane	1.00E-02	5.00E-02
Gamma-chlordane	8.00E-03	3.00E-02
gamma-BHC	1.35E-03	2.20E-03
Heptaclor	1.90E-03	3.78E-03
Heptaclor Epoxide	2.00E-03	4.90E-03
Methoxyclor	1.59E-02	3.69E-02
Dioxins/Furans		
2,3,7,8-TCDD	1.70E-04	5.10E-04
Inorganic Analytes		
Aluminum	7.97E+03	9.82E+03
Antimony	8.00E+00	1.88E+01
Arsenic	2.04E+01	3.64E+01
Barium	5.38E+02	8.46E+02
Beryllium	1.88E-01	3.58E-01
Cadmium	3.69E+00	1.52E+01
Chromium(III)	4.04E+01	7.02E+01
Cobalt	1.13E+01	1.63E+01
Copper	3.32E+02	1.87E+03
Cyanide	7.33E-01	1.50E+00
Iron	5.86E+04	1.49E+05
Lead	7.86E+02	2.97E+03
Manganese	5.59E+02	8.85E+02
Mercury	5.99E-01	1.73E+00
Nickel	4.78E+01	8.30E+01
Selenium	4.17E-01	8.28E-01
Silver	2.40E+00	1.53E+01
Thallium	5.16E-01	1.36E+00
Vanadium	2.05E+01	3.27E+01
Zinc	1.25E+03	4.03E+03

[a] Maximum detected value substituted where the 95% UCL value exceeded the maximum detected value.

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ESTIMATED PLANT TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Plant Uptake Factors	Mean and 95% Upper Confidence Limit Plant Tissue Concentrations (mg/kg dry weight)	
	Mean	95% Upper Confidence Limit	Fruit	Mean Fruit	95% Upper Confidence Limit Fruit
Volatile Organics					
Acetone	7.69E-03	9.00E-03	NE	NE	NE
1,1-Dichloroethene	5.40E-03	6.60E-03	3.35E+00	1.81E-02	2.21E-02
1,2-Dichloroethene	6.00E-03	5.00E-03	NE	NE	NE
Methylene Chloride	7.90E-03	1.26E-02	6.86E+00	5.42E-02	8.65E-02
Toluene	6.10E-03	8.50E-03	1.02E+00	6.24E-03	8.70E-03
1,1,1-Trichloroethane	4.95E-03	5.00E-03	1.39E+00	6.88E-03	6.95E-03
Xylene	5.90E-03	6.00E-03	5.05E-01	2.98E-03	3.03E-03
Semivolatile Organics					
Acenaphthene	1.18E-01	2.76E-01	2.30E+00	2.72E-01	6.34E-01
Acenaphthylene	1.27E-01	2.76E-01	2.81E-01	3.57E-02	7.75E-02
Anthracene	1.94E-01	4.16E-01	1.04E-01	2.01E-02	4.32E-02
Benzo(a)anthracene	5.54E-01	2.40E+00	2.24E-02	1.24E-02	5.39E-02
Benzo(a)pyrene	5.55E-01	2.11E+00	1.22E-02	6.75E-03	2.57E-02
Benzo(b)fluoranthene	6.23E-01	2.47E+00	1.22E-02	7.58E-03	3.01E-02
Benzo(g,h,i)perylene	4.56E-01	1.54E+00	6.69E-03	3.05E-03	1.03E-02
Benzo(k)fluoranthene	4.22E-01	1.86E+00	1.22E-02	5.14E-03	2.26E-02
Bis(2-ethylhexyl)phthalate	2.64E-01	3.96E-01	NE	NE	NE
Butylbenzylphthalate	2.11E-01	2.90E-01	2.37E-02	4.99E-03	6.87E-03
Carbazole	1.36E-01	2.60E-01	4.86E-01	6.60E-02	1.26E-01
Chrysene	5.71E-01	2.86E+00	2.22E-02	1.26E-02	6.32E-02
Dibenz(a,h)anthracene	2.38E-01	3.84E-01	4.55E-03	1.08E-03	1.75E-03
Dibenzofuran	1.29E-01	2.62E-01	1.61E-01	2.08E-02	4.22E-02
Diethylphthalate	1.82E-01	1.20E-01	1.39E+00	2.53E-01	1.67E-01
Di-N-butylphthalate	1.72E-01	3.12E-01	2.24E-02	3.86E-03	7.00E-03
Di-N-octylphthalate	1.46E-01	1.30E-01	**1.00E+00**	1.46E-01	1.30E-01
Fluoranthene	7.95E-01	3.89E+00	5.70E-02	4.53E-02	2.22E-01
Fluorene	1.13E-01	2.80E-01	1.45E-01	1.63E-02	4.05E-02
Indeno(1,2,3-cd)pyrene	4.13E-01	1.35E+00	6.78E-03	2.80E-03	9.15E-03

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ESTIMATED PLANT TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Plant Uptake Factors	Mean and 95% Upper Confidence Limit Plant Tissue Concentrations (mg/kg dry weight)	
Stressor	**Mean**	**95% Upper Confidence Limit**	**Fruit**	**Mean Fruit**	**95% Upper Confidence Limit Fruit**
2-Methylnapthalene	1.18E-01	1.90E-01	1.65E-01	1.95E-02	3.14E-02
Naphthalene	1.05E-01	2.22E-01	4.86E-01	5.10E-02	1.08E-01
Phenanthrene	4.54E-01	1.32E+00	1.47E+01	6.67E+00	1.94E+01
Pyrene	8.37E-01	3.99E+00	5.85E-02	4.90E-02	2.34E-01
Pesticides/PCBs					
Aldrin	1.67E-03	3.20E-03	7.05E-01	1.18E-03	2.26E-03
alpha-BHC	1.28E-03	2.00E-03	2.16E-01	2.76E-04	4.31E-04
Aroclor - 1254	3.86E-02	1.70E-01	7.05E-03	2.72E-04	1.20E-03
Aroclor - 1260	4.00E-02	1.41E-01	2.85E-03	1.14E-04	4.02E-04
beta-BHC	1.43E-03	2.70E-03	2.16E-01	3.08E-04	5.82E-04
DDD	1.15E-02	1.08E-01	1.01E-02	1.16E-04	1.09E-03
DDT	2.95E-02	2.27E-01	1.02E-02	3.02E-04	2.32E-03
delta-BHC	1.42E-03	2.45E-03	1.65E-01	2.35E-04	4.05E-04
Dieldrin	6.75E-03	3.10E-02	3.67E-01	2.48E-03	1.14E-02
Endosulfan II	5.20E-03	1.98E-02	3.44E-01	1.79E-03	6.80E-03
Endosulfan Sulfate	3.00E-03	5.88E-03	3.44E-01	1.03E-03	2.02E-03
Endrin	7.90E-03	2.87E-02	2.24E-02	1.77E-04	6.44E-04
Endrin Aldehyde	1.13E-02	4.90E-02	2.24E-02	2.53E-04	1.10E-03
Endrin Ketone	3.98E-03	1.29E-02	2.24E-02	8.93E-05	2.89E-04
Alpha-chlordane	1.00E-02	5.00E-02	4.67E-01	4.67E-03	2.33E-02
Gamma-chlordane	8.00E-03	3.00E-02	4.67E-01	3.73E-03	1.40E-02
gamma-BHC	1.35E-03	2.20E-03	2.16E-01	2.91E-04	4.74E-04
Heptaclor	1.90E-03	3.78E-03	1.11E-01	2.11E-04	4.19E-04
Heptaclor Epoxide	2.00E-03	4.90E-03	1.11E-01	2.22E-04	5.43E-04
Methoxyclor	1.59E-02	3.69E-02	4.48E-02	7.13E-04	1.65E-03
Dioxins/Furans					
2,3,7,8-TCDD	1.70E-04	5.10E-04	1.08E-02	1.84E-06	5.51E-06
Inorganic Analytes					
Aluminum	7.97E+03	9.82E+03	6.50E-04	5.18E+00	6.38E+00

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ESTIMATED PLANT TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Plant Uptake Factors	Mean and 95% Upper Confidence Limit Plant Tissue Concentrations (mg/kg dry weight)	
Stressor	Mean	95% Upper Confidence Limit	Fruit	Mean Fruit	95% Upper Confidence Limit Fruit
Antimony	8.00E+00	1.88E+01	3.00E-02	2.40E-01	5.65E-01
Arsenic	2.04E+01	3.64E+01	6.00E-03	1.22E-01	2.18E-01
Barium	5.38E+02	8.46E+02	1.50E-02	8.07E+00	1.27E+01
Beryllium	1.88E-01	3.58E-01	1.50E-03	2.82E-04	5.37E-04
Cadmium	3.69E+00	1.52E+01	6.00E-02	2.21E-01	9.12E-01
Chromium(III)	4.04E+01	7.02E+01	4.50E-03	1.82E-01	3.16E-01
Cobalt	1.13E+01	1.63E+01	7.00E-03	7.91E-02	1.14E-01
Copper	3.32E+02	1.87E+03	2.70E-01	8.96E+01	5.06E+02
Cyanide	7.33E-01	1.50E+00	**1.00E+00**	7.33E-01	1.50E+00
Iron	5.86E+04	1.49E+05	1.00E-03	5.86E+01	1.49E+02
Lead	7.86E+02	2.97E+03	7.00E-03	5.50E+00	2.08E+01
Manganese	5.59E+02	8.85E+02	5.00E-02	2.79E+01	4.43E+01
Mercury	5.99E-01	1.73E+00	3.10E-01	1.86E-01	5.36E-01
Nickel	4.78E+01	8.30E+01	6.00E-02	2.87E+00	4.98E+00
Selenium	4.17E-01	8.28E-01	2.50E-02	1.04E-02	2.07E-02
Silver	2.40E+00	1.53E+01	1.00E-01	2.40E-01	1.53E+00
Thallium	5.16E-01	1.36E+00	**1.00E+00**	5.16E-01	1.36E+00
Vanadium	2.05E+01	3.27E+01	3.00E-03	6.15E-02	9.80E-02
Zinc	1.25E+03	4.03E+03	3.30E-02	4.14E+01	1.33E+02

NDA - No data available.

NE - Not evaluated due to lack of data.

Bold, shaded numbers represent the assumption of 100% bioaccumulation for plant tissue in the absence of literature data.

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**ESTIMATED EARTHWORM TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Earthworm Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Earthworm Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Volatile Organics					
Acetone	7.69E-03	9.00E-03	**1.00E+00**	7.69E-03	9.00E-03
1,1-Dichloroethene	5.40E-03	6.60E-03	**1.00E+00**	5.40E-03	6.60E-03
1,2-Dichloroethene	6.00E-03	5.00E-03	**1.00E+00**	6.00E-03	5.00E-03
Methylene Chloride	7.90E-03	1.26E-02	**1.00E+00**	7.90E-03	1.26E-02
Toluene	6.10E-03	8.50E-03	**1.00E+00**	6.10E-03	8.50E-03
1,1,1-Trichloroethane	4.95E-03	5.00E-03	**1.00E+00**	4.95E-03	5.00E-03
Xylene	5.90E-03	6.00E-03	**1.00E+00**	5.90E-03	6.00E-03
Semivolatile Organics					
Acenaphthene	1.18E-01	2.76E-01	3.00E-01	3.55E-02	8.27E-02
Acenaphthylene	1.27E-01	2.76E-01	2.20E-01	2.79E-02	6.06E-02
Anthracene	1.94E-01	4.16E-01	5.00E-02	9.70E-03	2.08E-02
Benzo(a)anthracene	5.54E-01	2.40E+00	1.00E-01	5.54E-02	2.40E-01
Benzo(a)pyrene	5.55E-01	2.11E+00	3.00E-01	1.67E-01	6.33E-01
Benzo(b)fluoranthene	6.23E-01	2.47E+00	3.00E-01	1.87E-01	7.41E-01
Benzo(g,h,i)perylene	4.56E-01	1.54E+00	2.00E-01	9.12E-02	3.07E-01
Benzo(k)fluoranthene	4.22E-01	1.86E+00	3.00E-01	1.27E-01	5.58E-01
Bis(2-ethylhexyl)phthalate	2.64E-01	3.96E-01	**1.00E+00**	2.64E-01	3.96E-01
Butylbenzylphthalate	2.11E-01	2.90E-01	**1.00E+00**	2.11E-01	2.90E-01
Carbazole	1.36E-01	2.60E-01	**1.00E+00**	1.36E-01	2.60E-01
Chrysene	5.71E-01	2.86E+00	2.00E-01	1.14E-01	5.71E-01
Dibenz(a,h)anthracene	2.38E-01	3.84E-01	4.90E-01	1.17E-01	1.88E-01
Dibenzofuran	1.29E-01	2.62E-01	**1.00E+00**	1.29E-01	2.62E-01
Diethylphthalate	1.82E-01	1.20E-01	**1.00E+00**	1.82E-01	1.20E-01
Di-N-butylphthalate	1.72E-01	3.12E-01	**1.00E+00**	1.72E-01	3.12E-01
Di-N-octylphthalate	1.46E-01	1.30E-01	**1.00E+00**	1.46E-01	1.30E-01
Fluoranthene	7.95E-01	3.89E+00	8.00E-02	6.36E-02	3.11E-01

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**ESTIMATED EARTHWORM TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Earthworm Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Earthworm Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Fluorene	1.13E-01	2.80E-01	2.00E-01	2.26E-02	5.60E-02
Indeno(1,2,3-cd)pyrene	4.13E-01	1.35E+00	4.00E-01	1.65E-01	5.40E-01
2-Methylnapthalene	1.18E-01	1.90E-01	2.00E-01	2.36E-02	3.80E-02
Naphthalene	1.05E-01	2.22E-01	2.10E-01	2.21E-02	4.66E-02
Phenanthrene	4.54E-01	1.32E+00	1.00E-01	4.54E-02	1.32E-01
Pyrene	8.37E-01	3.99E+00	9.00E-02	7.53E-02	3.59E-01
Pesticides/PCB					
Aldrin	1.67E-03	3.20E-03	2.50E-01	4.18E-04	8.00E-04
alpha-BHC	1.28E-03	2.00E-03	**1.00E+00**	1.28E-03	2.00E-03
Aroclor - 1254	3.86E-02	1.70E-01	**1.00E+00**	3.86E-02	1.70E-01
Aroclor - 1260	4.00E-02	1.41E-01	**1.00E+00**	4.00E-02	1.41E-01
beta-BHC	1.43E-03	2.70E-03	2.50E-01	3.58E-04	6.75E-04
DDD	1.15E-02	1.08E-01	2.00E-01	2.30E-03	2.15E-02
DDT	2.95E-02	2.27E-01	2.50E-01	7.38E-03	5.68E-02
delta-BHC	1.42E-03	2.45E-03	2.50E-01	3.55E-04	6.13E-04
Dieldrin	6.75E-03	3.10E-02	2.50E-01	1.69E-03	7.75E-03
Endosulfan II	5.20E-03	1.98E-02	2.50E-01	1.30E-03	4.95E-03
Endosulfan Sulfate	3.00E-03	5.88E-03	2.50E-01	7.50E-04	1.47E-03
Endrin	7.90E-03	2.87E-02	2.50E-01	1.98E-03	7.18E-03
Endrin Aldehyde	1.13E-02	4.90E-02	2.50E-01	2.82E-03	1.23E-02
Endrin Ketone	3.98E-03	1.29E-02	2.50E-01	9.95E-04	3.22E-03
Alpha-chlordane	1.00E-02	5.00E-02	2.50E-01	2.50E-03	1.25E-02
Gamma-chlordane	8.00E-03	3.00E-02	2.50E-01	2.00E-03	7.50E-03
gamma-BHC	1.35E-03	2.20E-03	2.50E-01	3.38E-04	5.50E-04
Heptaclor	1.90E-03	3.78E-03	2.50E-01	4.75E-04	9.45E-04
Heptaclor Epoxide	2.00E-03	4.90E-03	2.50E-01	5.00E-04	1.23E-03
Methoxyclor	1.59E-02	3.69E-02	2.50E-01	3.98E-03	9.22E-03

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**ESTIMATED EARTHWORM TISSUE CONCENTRATIONS
CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Earthworm Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Earthworm Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Dioxins/Furans					
2,3,7,8-TCDD	1.70E-04	5.10E-04	**1.00E+00**	1.70E-04	5.10E-04
Inorganic Analytes					
Aluminum	7.97E+03	9.82E+03	**1.00E+00**	7.97E+03	9.82E+03
Antimony	8.00E+00	1.88E+01	**1.00E+00**	8.00E+00	1.88E+01
Arsenic	2.04E+01	3.64E+01	6.00E-02	1.22E+00	2.18E+00
Barium	5.38E+02	8.46E+02	3.60E-01	1.94E+02	3.05E+02
Beryllium	1.88E-01	3.58E-01	**1.00E+00**	1.88E-01	3.58E-01
Cadmium	3.69E+00	1.52E+01	2.10E+01	7.75E+01	3.19E+02
Chromium(III)	4.04E+01	7.02E+01	2.70E-01	1.09E+01	1.90E+01
Cobalt	1.13E+01	1.63E+01	**1.00E+00**	1.13E+01	1.63E+01
Copper	3.32E+02	1.87E+03	3.60E-01	1.19E+02	6.75E+02
Cyanide	7.33E-01	1.50E+00	**1.00E+00**	7.33E-01	1.50E+00
Iron	5.86E+04	1.49E+05	3.80E-01	2.23E+04	5.66E+04
Lead	7.86E+02	2.97E+03	6.60E-01	5.19E+02	1.96E+03
Manganese	5.59E+02	8.85E+02	4.00E-01	2.23E+02	3.54E+02
Mercury	5.99E-01	1.73E+00	9.60E-01	5.75E-01	1.66E+00
Nickel	4.78E+01	8.30E+01	4.10E-01	1.96E+01	3.40E+01
Selenium	4.17E-01	8.28E-01	**1.00E+00**	4.17E-01	8.28E-01
Silver	2.40E+00	1.53E+01	**1.00E+00**	2.40E+00	1.53E+01
Thallium	5.16E-01	1.36E+00	**1.00E+00**	5.16E-01	1.36E+00
Vanadium	2.05E+01	3.27E+01	**1.00E+00**	2.05E+01	3.27E+01
Zinc	1.25E+03	4.03E+03	6.90E+00	8.66E+03	2.78E+04

a - A bioaccumulation factor of 1 (100%) was assumed for earthworm tissue in the absence of literature data (EPA 1994a).

Bold, shaded numbers represent the assumption of 100% bioaccumulation for earthworm tissue in the absence of literature data.

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Table V - 45

ESTIMATED SHORT-TAILED SHREW TISSUE CONCENTRATIONS CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Small Mammal Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Small Mammal Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Volatile Organics					
Acetone	7.69E-03	9.00E-03	**1.00E+00**	7.69E-03	9.00E-03
1,1-Dichloroethene	5.40E-03	6.60E-03	**1.00E+00**	5.40E-03	6.60E-03
1,2-Dichloroethene	6.00E-03	5.00E-03	**1.00E+00**	6.00E-03	5.00E-03
Methylene Chloride	7.90E-03	1.26E-02	**1.00E+00**	7.90E-03	1.26E-02
Toluene	6.10E-03	8.50E-03	**1.00E+00**	6.10E-03	8.50E-03
1,1,1-Trichloroethane	4.95E-03	5.00E-03	**1.00E+00**	4.95E-03	5.00E-03
Xylene	5.90E-03	6.00E-03	**1.00E+00**	5.90E-03	6.00E-03
Semivolatile Organics					
Acenaphthene	1.18E-01	2.76E-01	3.10E+01	3.67E+00	8.54E+00
Acenaphthylene	1.27E-01	2.76E-01	**1.00E+00**	1.27E-01	2.76E-01
Anthracene	1.94E-01	4.16E-01	**1.00E+00**	1.94E-01	4.16E-01
Benzo(a)anthracene	5.54E-01	2.40E+00	**1.00E+00**	5.54E-01	2.40E+00
Benzo(a)pyrene	5.55E-01	2.11E+00	**1.00E+00**	5.55E-01	2.11E+00
Benzo(b)fluoranthene	6.23E-01	2.47E+00	**1.00E+00**	6.23E-01	2.47E+00
Benzo(g,h,i)perylene	4.56E-01	1.54E+00	**1.00E+00**	4.56E-01	1.54E+00
Benzo(k)fluoranthene	4.22E-01	1.86E+00	**1.00E+00**	4.22E-01	1.86E+00
Bis(2-ethylhexyl)phthalate	2.64E-01	3.96E-01	**1.00E+00**	2.64E-01	3.96E-01
Butylbenzylphthalate	2.11E-01	2.90E-01	**1.00E+00**	2.11E-01	2.90E-01
Carbazole	1.36E-01	2.60E-01	**1.00E+00**	1.36E-01	2.60E-01
Chrysene	5.71E-01	2.86E+00	**1.00E+00**	5.71E-01	2.86E+00
Dibenz(a,h)anthracene	2.38E-01	3.84E-01	**1.00E+00**	2.38E-01	3.84E-01
Dibenzofuran	1.29E-01	2.62E-01	**1.00E+00**	1.29E-01	2.62E-01
Diethylphthalate	1.82E-01	1.20E-01	**1.00E+00**	1.82E-01	1.20E-01
Di-N-butylphthalate	1.72E-01	3.12E-01	**1.00E+00**	1.72E-01	3.12E-01
Di-N-octylphthalate	1.46E-01	1.30E-01	**1.00E+00**	1.46E-01	1.30E-01
Fluoranthene	7.95E-01	3.89E+00	**1.00E+00**	7.95E-01	3.89E+00
Fluorene	1.13E-01	2.80E-01	**1.00E+00**	1.13E-01	2.80E-01
Indeno(1,2,3-cd)pyrene	4.13E-01	1.35E+00	**1.00E+00**	4.13E-01	1.35E+00

Table V - 45

ESTIMATED SHORT-TAILED SHREW TISSUE CONCENTRATIONS CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Small Mammal Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Small Mammal Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
2-Methylnapthalene	1.18E-01	1.90E-01	**1.00E+00**	1.18E-01	1.90E-01
Naphthalene	1.05E-01	2.22E-01	**1.00E+00**	1.05E-01	2.22E-01
Phenanthrene	4.54E-01	1.32E+00	1.20E+01	5.45E+00	1.58E+01
Pyrene	8.37E-01	3.99E+00	**1.00E+00**	8.37E-01	3.99E+00
Pesticides/PCBs					
Aldrin	1.67E-03	3.20E-03	**1.00E+00**	1.67E-03	3.20E-03
alpha-BHC	1.28E-03	2.00E-03	**1.00E+00**	1.28E-03	2.00E-03
Aroclor - 1254	3.86E-02	1.70E-01	**1.00E+00**	3.86E-02	1.70E-01
Aroclor - 1260	4.00E-02	1.41E-01	**1.00E+00**	4.00E-02	1.41E-01
beta-BHC	1.43E-03	2.70E-03	**1.00E+00**	1.43E-03	2.70E-03
DDD	1.15E-02	1.08E-01	1.00E+00	1.15E-02	1.08E-01
DDT	2.95E-02	2.27E-01	1.00E+00	2.95E-02	2.27E-01
delta-BHC	1.42E-03	2.45E-03	**1.00E+00**	1.42E-03	2.45E-03
Dieldrin	6.75E-03	3.10E-02	**1.00E+00**	6.75E-03	3.10E-02
Endosulfan II	5.20E-03	1.98E-02	**1.00E+00**	5.20E-03	1.98E-02
Endosulfan Sulfate	3.00E-03	5.88E-03	**1.00E+00**	3.00E-03	5.88E-03
Endrin	7.90E-03	2.87E-02	**1.00E+00**	7.90E-03	2.87E-02
Endrin Aldehyde	1.13E-02	4.90E-02	**1.00E+00**	1.13E-02	4.90E-02
Endrin Ketone	3.98E-03	1.29E-02	**1.00E+00**	3.98E-03	1.29E-02
Alpha-chlordane	1.00E-02	5.00E-02	**1.00E+00**	1.00E-02	5.00E-02
Gamma-chlordane	8.00E-03	3.00E-02	**1.00E+00**	8.00E-03	3.00E-02
gamma-BHC	1.35E-03	2.20E-03	**1.00E+00**	1.35E-03	2.20E-03
Heptaclor	1.90E-03	3.78E-03	**1.00E+00**	1.90E-03	3.78E-03
Heptaclor Epoxide	2.00E-03	4.90E-03	**1.00E+00**	2.00E-03	4.90E-03
Methoxyclor	1.59E-02	3.69E-02	**1.00E+00**	1.59E-02	3.69E-02
Dioxins/Furans					
2,3,7,8-TCDD	1.70E-04	5.10E-04	2.45E+01	4.17E-03	1.25E-02
Inorganic Analytes					
Aluminum	7.97E+03	9.82E+03	**1.00E+00**	7.97E+03	9.82E+03

Table V - 45

ESTIMATED SHORT-TAILED SHREW TISSUE CONCENTRATIONS CALCULATED FOR THE UNDEVELOPED LANDFILL, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Small Mammal Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Small Mammal Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Antimony	8.00E+00	1.88E+01	**1.00E+00**	8.00E+00	1.88E+01
Arsenic	2.04E+01	3.64E+01	**1.00E+00**	2.04E+01	3.64E+01
Barium	5.38E+02	8.46E+02	**1.00E+00**	5.38E+02	8.46E+02
Beryllium	1.88E-01	3.58E-01	**1.00E+00**	1.88E-01	3.58E-01
Cadmium	3.69E+00	1.52E+01	4.50E-01	1.66E+00	6.84E+00
Chromium(III)	4.04E+01	7.02E+01	**1.00E+00**	4.04E+01	7.02E+01
Cobalt	1.13E+01	1.63E+01	**1.00E+00**	1.13E+01	1.63E+01
Copper	3.32E+02	1.87E+03	3.20E-01	1.06E+02	6.00E+02
Cyanide	7.33E-01	1.50E+00	**1.00E+00**	7.33E-01	1.50E+00
Iron	5.86E+04	1.49E+05	**1.00E+00**	5.86E+04	1.49E+05
Lead	7.86E+02	2.97E+03	**1.00E-01**	7.86E+01	2.97E+02
Manganese	5.59E+02	8.85E+02	**1.00E+00**	5.59E+02	8.85E+02
Mercury	5.99E-01	1.73E+00	**1.00E+00**	5.99E-01	1.73E+00
Nickel	4.78E+01	8.30E+01	**1.00E+00**	4.78E+01	8.30E+01
Selenium	4.17E-01	8.28E-01	**1.00E+00**	4.17E-01	8.28E-01
Silver	2.40E+00	1.53E+01	**1.00E+00**	2.40E+00	1.53E+01
Thallium	5.16E-01	1.36E+00	**1.00E+00**	5.16E-01	1.36E+00
Vanadium	2.05E+01	3.27E+01	**1.00E+00**	2.05E+01	3.27E+01
Zinc	1.25E+03	4.03E+03	2.50E-01	3.14E+02	1.01E+03

a - A bioaccumulation factor of 1 (100%) was assumed for shrew tissue in the absence of literature data (EPA 1994a).

Bold, shaded numbers represent the assumption of 100% bioaccumulation for shrew tissue in the absence of literature data.

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ESTIMATED ROBIN TISSUE CONCENTRATIONS
FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Bird Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Bird Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Volatile Organics					
Acetone	7.69E-03	9.00E-03	**1.00E+00**	7.69E-03	9.00E-03
1,1-Dichloroethene	5.40E-03	6.60E-03	**1.00E+00**	5.40E-03	6.60E-03
1,2-Dichloroethene	6.00E-03	5.00E-03	**1.00E+00**	6.00E-03	5.00E-03
Methylene Chloride	7.90E-03	1.26E-02	**1.00E+00**	7.90E-03	1.26E-02
Toluene	6.10E-03	8.50E-03	**1.00E+00**	6.10E-03	8.50E-03
1,1,1-Trichloroethane	4.95E-03	5.00E-03	**1.00E+00**	4.95E-03	5.00E-03
Xylene	5.90E-03	6.00E-03	**1.00E+00**	5.90E-03	6.00E-03
Semivolatile Organics					
Acenaphthene	1.18E-01	2.76E-01	**1.00E+00**	1.18E-01	2.76E-01
Acenaphthylene	1.27E-01	2.76E-01	**1.00E+00**	1.27E-01	2.76E-01
Anthracene	1.94E-01	4.16E-01	**1.00E+00**	1.94E-01	4.16E-01
Benzo(a)anthracene	5.54E-01	2.40E+00	**1.00E+00**	5.54E-01	2.40E+00
Benzo(a)pyrene	5.55E-01	2.11E+00	**1.00E+00**	5.55E-01	2.11E+00
Benzo(b)fluoranthene	6.23E-01	2.47E+00	**1.00E+00**	6.23E-01	2.47E+00
Benzo(g,h,i)perylene	4.56E-01	1.54E+00	**1.00E+00**	4.56E-01	1.54E+00
Benzo(k)fluoranthene	4.22E-01	1.86E+00	**1.00E+00**	4.22E-01	1.86E+00
Bis(2-ethylhexyl)phthalate	2.64E-01	3.96E-01	**1.00E+00**	2.64E-01	3.96E-01
Butylbenzylphthalate	2.11E-01	2.90E-01	**1.00E+00**	2.11E-01	2.90E-01
Carbazole	1.36E-01	2.60E-01	**1.00E+00**	1.36E-01	2.60E-01
Chrysene	5.71E-01	2.86E+00	**1.00E+00**	5.71E-01	2.86E+00
Dibenz(a,h)anthracene	2.38E-01	3.84E-01	**1.00E+00**	2.38E-01	3.84E-01
Dibenzofuran	1.29E-01	2.62E-01	**1.00E+00**	1.29E-01	2.62E-01
Diethylphthalate	1.82E-01	1.20E-01	**1.00E+00**	1.82E-01	1.20E-01
Di-N-butylphthalate	1.72E-01	3.12E-01	**1.00E+00**	1.72E-01	3.12E-01
Di-N-octylphthalate	1.46E-01	1.30E-01	**1.00E+00**	1.46E-01	1.30E-01
Fluoranthene	7.95E-01	3.89E+00	**1.00E+00**	7.95E-01	3.89E+00

Table V - 46

**ESTIMATED ROBIN TISSUE CONCENTRATIONS
FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Bird Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Bird Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Fluorene	1.13E-01	2.80E-01	**1.00E+00**	1.13E-01	2.80E-01
Indeno(1,2,3-cd)pyrene	4.13E-01	1.35E+00	**1.00E+00**	4.13E-01	1.35E+00
2-Methylnapthalene	1.18E-01	1.90E-01	**1.00E+00**	1.18E-01	1.90E-01
Naphthalene	1.05E-01	2.22E-01	**1.00E+00**	1.05E-01	2.22E-01
Phenanthrene	4.54E-01	1.32E+00	**1.00E+00**	4.54E-01	1.32E+00
Pyrene	8.37E-01	3.99E+00	**1.00E+00**	8.37E-01	3.99E+00
Pesticides/PCBs					
Aldrin	1.67E-03	3.20E-03	**1.00E+00**	1.67E-03	3.20E-03
alpha-BHC	1.28E-03	2.00E-03	**1.00E+00**	1.28E-03	2.00E-03
Aroclor - 1254	3.86E-02	1.70E-01	5.52E+01	2.13E+00	9.38E+00
Aroclor - 1260	4.00E-02	1.41E-01	5.52E+01	2.21E+00	7.78E+00
beta-BHC	1.43E-03	2.70E-03	**1.00E+00**	1.43E-03	2.70E-03
DDD	1.15E-02	1.08E-01	1.10E+01	1.27E-01	1.18E+00
DDT	2.95E-02	2.27E-01	1.10E+01	3.25E-01	2.50E+00
delta-BHC	1.42E-03	2.45E-03	**1.00E+00**	1.42E-03	2.45E-03
Dieldrin	6.75E-03	3.10E-02	**1.00E+00**	6.75E-03	3.10E-02
Endosulfan II	5.20E-03	1.98E-02	**1.00E+00**	5.20E-03	1.98E-02
Endosulfan Sulfate	3.00E-03	5.88E-03	**1.00E+00**	3.00E-03	5.88E-03
Endrin	7.90E-03	2.87E-02	**1.00E+00**	7.90E-03	2.87E-02
Endrin Aldehyde	1.13E-02	4.90E-02	**1.00E+00**	1.13E-02	4.90E-02
Endrin Ketone	3.98E-03	1.29E-02	**1.00E+00**	3.98E-03	1.29E-02
Alpha-chlordane	1.00E-02	5.00E-02	**1.00E+00**	1.00E-02	5.00E-02
Gamma-chlordane	8.00E-03	3.00E-02	**1.00E+00**	8.00E-03	3.00E-02
gamma-BHC	1.35E-03	2.20E-03	**1.00E+00**	1.35E-03	2.20E-03
Heptaclor	1.90E-03	3.78E-03	4.50E+00	8.55E-03	1.70E-02
Heptaçlor Epoxide	2.00E-03	4.90E-03	4.50E+00	9.00E-03	2.21E-02
Methoxyclor	1.59E-02	3.69E-02	**1.00E+00**	1.59E-02	3.69E-02

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ESTIMATED ROBIN TISSUE CONCENTRATIONS
FOR THE UNDEVELOPED LANDFILL, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Undeveloped Landfill Surface Soil Concentrations (mg/kg)		Bird Bioaccumulation Factors [a]	Mean and 95% Upper Confidence Limit Bird Tissue Concentrations	
	Mean	95% Upper Confidence Limit		Mean	95% Upper Confidence Limit
Dioxins/Furans					
2,3,7,8-TCDD	1.70E-04	5.10E-04	**1.00E+00**	1.70E-04	5.10E-04
Inorganic Analytes					
Aluminum	7.97E+03	9.82E+03	**1.00E+00**	7.97E+03	9.82E+03
Antimony	8.00E+00	1.88E+01	**1.00E+00**	8.00E+00	1.88E+01
Arsenic	2.04E+01	3.64E+01	**1.00E+00**	2.04E+01	3.64E+01
Barium	5.38E+02	8.46E+02	**1.00E+00**	5.38E+02	8.46E+02
Beryllium	1.88E-01	3.58E-01	**1.00E+00**	1.88E-01	3.58E-01
Cadmium	3.69E+00	1.52E+01	3.00E-02	1.11E-01	4.56E-01
Chromium(III)	4.04E+01	7.02E+01	**1.00E+00**	4.04E+01	7.02E+01
Cobalt	1.13E+01	1.63E+01	**1.00E+00**	1.13E+01	1.63E+01
Copper	3.32E+02	1.87E+03	6.00E-02	1.99E+01	1.12E+02
Cyanide	7.33E-01	1.50E+00	**1.00E+00**	7.33E-01	1.50E+00
Iron	5.86E+04	1.49E+05	**1.00E+00**	5.86E+04	1.49E+05
Lead	7.86E+02	2.97E+03	2.40E-01	1.89E+02	7.14E+02
Manganese	5.59E+02	8.85E+02	**1.00E+00**	5.59E+02	8.85E+02
Mercury	5.99E-01	1.73E+00	**1.00E+00**	5.99E-01	1.73E+00
Nickel	4.78E+01	8.30E+01	**1.00E+00**	4.78E+01	8.30E+01
Selenium	4.17E-01	8.28E-01	**1.00E+00**	4.17E-01	8.28E-01
Silver	2.40E+00	1.53E+01	**1.00E+00**	2.40E+00	1.53E+01
Thallium	5.16E-01	1.36E+00	**1.00E+00**	5.16E-01	1.36E+00
Vanadium	2.05E+01	3.27E+01	**1.00E+00**	2.05E+01	3.27E+01
Zinc	1.25E+03	4.03E+03	1.30E-02	1.63E+01	5.24E+01

a - A bioaccumulation factor of 1 (100%) was assumed for robin tissue in the absence of literature data (EPA 1994a).

Bold, shaded numbers represent the assumption of 100% bioaccumulation for robin tissue in the absence of literature data.

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EXPOSURE PARAMETERS FOR MEASUREMENT SPECIES, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Receptor	Percentage of Diet						Home Range (acres)	Site Use Factor	Exposure Duration	Ingestion Rate (kg/day)	Body Weight (kg)
	Plants	Small Mammals	Birds	Earthworms	Insects	Soil [a]					
Short-tailed Shrew	-	-	-	100	-	10.4	1.5	1	1	0.002	0.017
American Robin	50	-	-	50	-	10.4	2	1	1	0.004	0.082
American Kestrel	-	47	52	-	1	-	180	0.22	1	0.005	0.114

[a] Soil ingestion percentage represents a percentage of the dietary intake of the species of concern.

Source: Ecology and Environment, Inc., 1994.

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Table V - 48

SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion	Mean Earthworm Ingestion	Mean Oral Total Dose	95% Upper Confidence Limit Soil Ingestion	95% Upper Confidence Limit Earthworm Ingestion	95% Upper Confidence Limit Oral Total Dose
Volatile Organics						
Acetone	9.41E-05	9.05E-04	9.99E-04	1.10E-04	1.06E-03	1.17E-03
1,1-Dichloroethene	6.61E-05	6.35E-04	7.01E-04	8.08E-05	7.76E-04	8.57E-04
1,2-Dichloroethene	7.34E-05	7.06E-04	7.79E-04	6.12E-05	5.88E-04	6.49E-04
Methylene Chloride	9.67E-05	9.29E-04	1.03E-03	1.54E-04	1.48E-03	1.64E-03
Toluene	7.46E-05	7.18E-04	7.92E-04	1.04E-04	1.00E-03	1.10E-03
1,1,1-Trichloroethane	6.06E-05	5.82E-04	6.43E-04	6.12E-05	5.88E-04	6.49E-04
Xylene	7.22E-05	6.94E-04	7.66E-04	7.34E-05	7.06E-04	7.79E-04
Semivolatile Organics						
Acenaphthene	1.45E-03	4.18E-03	5.63E-03	3.37E-03	9.72E-03	1.31E-02
Acenaphthylene	1.55E-03	3.29E-03	4.84E-03	3.37E-03	7.13E-03	1.05E-02
Anthracene	2.37E-03	1.14E-03	3.51E-03	5.09E-03	2.45E-03	7.54E-03
Benzo(a)anthracene	6.78E-03	6.52E-03	1.33E-02	2.94E-02	2.82E-02	5.76E-02
Benzo(a)pyrene	6.79E-03	1.96E-02	2.64E-02	2.58E-02	7.45E-02	1.00E-01
Benzo(b)fluoranthene	7.62E-03	2.20E-02	2.96E-02	3.02E-02	8.72E-02	1.17E-01
Benzo(g,h,i)perylene	5.58E-03	1.07E-02	1.63E-02	1.88E-02	3.62E-02	5.50E-02
Benzo(k)fluoranthene	5.16E-03	1.49E-02	2.01E-02	2.28E-02	6.56E-02	8.84E-02
Bis(2-ethylhexyl)phthalate	3.23E-03	3.11E-02	3.43E-02	4.85E-03	4.66E-02	5.14E-02
Butylbenzylphthalate	2.58E-03	2.48E-02	2.74E-02	3.55E-03	3.41E-02	3.77E-02
Carbazole	1.66E-03	1.60E-02	1.76E-02	3.18E-03	3.06E-02	3.38E-02
Chrysene	6.99E-03	1.34E-02	2.04E-02	3.49E-02	6.72E-02	1.02E-01
Dibenz(a,h)anthracene	2.91E-03	1.37E-02	1.66E-02	4.70E-03	2.21E-02	2.68E-02
Dibenzofuran	1.58E-03	1.52E-02	1.68E-02	3.21E-03	3.08E-02	3.40E-02
Diethylphthalate	2.23E-03	2.14E-02	2.36E-02	1.47E-03	1.41E-02	1.56E-02
Di-N-butylphthalate	2.10E-03	2.02E-02	2.23E-02	3.82E-03	3.67E-02	4.05E-02
Di-N-octylphthalate	1.79E-03	1.72E-02	1.90E-02	1.59E-03	1.53E-02	1.69E-02
Fluoranthene	9.73E-03	7.48E-03	1.72E-02	4.76E-02	3.66E-02	8.42E-02
Fluorene	1.38E-03	2.66E-03	4.04E-03	3.43E-03	6.59E-03	1.00E-02
Indeno(1,2,3-cd)pyrene	5.05E-03	1.94E-02	2.45E-02	1.65E-02	6.35E-02	8.00E-02
2-Methylnapthalene	1.44E-03	2.77E-03	4.22E-03	2.32E-03	4.47E-03	6.80E-03
Naphthalene	1.28E-03	2.59E-03	3.88E-03	2.72E-03	5.48E-03	8.20E-03

Table V - 48

SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion	Mean Earthworm Ingestion	Mean Oral Total Dose	95% Upper Confidence Limit Soil Ingestion	95% Upper Confidence Limit Earthworm Ingestion	95% Upper Confidence Limit Oral Total Dose
Phenanthrene	5.55E-03	5.34E-03	1.09E-02	1.62E-02	1.55E-02	3.17E-02
Pyrene	1.02E-02	8.86E-03	1.91E-02	4.88E-02	4.22E-02	9.11E-02
Pesticides/PCBs						
Aldrin	2.04E-05	4.91E-05	6.96E-05	3.92E-05	9.41E-05	1.33E-04
alpha-BHC	1.57E-05	1.51E-04	1.66E-04	2.45E-05	2.35E-04	2.60E-04
Aroclor - 1254	4.72E-04	4.54E-03	5.01E-03	2.08E-03	2.00E-02	2.21E-02
Aroclor - 1260	4.89E-04	4.71E-03	5.20E-03	1.73E-03	1.66E-02	1.83E-02
beta-BHC	1.75E-05	4.21E-05	5.96E-05	3.30E-05	7.94E-05	1.12E-04
DDD	1.41E-04	2.71E-04	4.11E-04	1.32E-03	2.53E-03	3.85E-03
DDT	3.61E-04	8.68E-04	1.23E-03	2.78E-03	6.68E-03	9.45E-03
delta-BHC	1.74E-05	4.18E-05	5.91E-05	3.00E-05	7.21E-05	1.02E-04
Dieldrin	8.26E-05	1.99E-04	2.81E-04	3.79E-04	9.12E-04	1.29E-03
Endosulfan II	6.36E-05	1.53E-04	2.17E-04	2.42E-04	5.82E-04	8.25E-04
Endosulfan Sulfate	3.67E-05	8.82E-05	1.25E-04	7.19E-05	1.73E-04	2.45E-04
Endrin	9.67E-05	2.32E-04	3.29E-04	3.51E-04	8.44E-04	1.20E-03
Endrin Aldehyde	1.38E-04	3.32E-04	4.70E-04	6.00E-04	1.44E-03	2.04E-03
Endrin Ketone	4.87E-05	1.17E-04	1.66E-04	1.58E-04	3.79E-04	5.36E-04
Alpha-chlordane	1.22E-04	2.94E-04	4.16E-04	6.12E-04	1.47E-03	2.08E-03
Gamma-chlordane	9.79E-05	2.35E-04	3.33E-04	3.67E-04	8.82E-04	1.25E-03
gamma-BHC	1.65E-05	3.97E-05	5.62E-05	2.69E-05	6.47E-05	9.16E-05
Heptaclor	2.32E-05	5.59E-05	7.91E-05	4.62E-05	1.11E-04	1.57E-04
Heptaclor Epoxide	2.45E-05	5.88E-05	8.33E-05	6.00E-05	1.44E-04	2.04E-04
Methoxyclor	1.95E-04	4.68E-04	6.62E-04	4.51E-04	1.08E-03	1.54E-03
Dioxins/Furans						
2,3,7,8-TCDD	2.08E-06	2.00E-05	2.21E-05	6.24E-06	6.00E-05	6.62E-05
Inorganic Analytes						
Aluminum	9.75E+01	9.38E+02	1.04E+03	1.20E+02	1.15E+03	1.27E+03
Antimony	9.79E-02	9.41E-01	1.04E+00	2.30E-01	2.22E+00	2.45E+00
Arsenic	2.50E-01	1.44E-01	3.94E-01	4.45E-01	2.57E-01	7.02E-01
Barium	6.58E+00	2.28E+01	2.94E+01	1.03E+01	3.58E+01	4.62E+01
Beryllium	2.30E-03	2.21E-02	2.44E-02	4.38E-03	4.21E-02	4.65E-02

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SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion	Mean Earthworm Ingestion	Mean Oral Total Dose	95% Upper Confidence Limit Soil Ingestion	95% Upper Confidence Limit Earthworm Ingestion	95% Upper Confidence Limit Oral Total Dose
Cadmium	4.51E-02	9.12E+00	9.16E+00	1.86E-01	3.76E+01	3.77E+01
Chromium(III)	4.94E-01	1.28E+00	1.78E+00	8.59E-01	2.23E+00	3.09E+00
Cobalt	1.38E-01	1.33E+00	1.47E+00	1.99E-01	1.91E+00	2.11E+00
Copper	4.06E+00	1.40E+01	1.81E+01	2.29E+01	7.94E+01	1.02E+02
Cyanide	8.97E-03	8.62E-02	9.52E-02	1.83E-02	1.76E-01	1.94E-01
Iron	7.17E+02	2.62E+03	3.34E+03	1.82E+03	6.66E+03	8.48E+03
Lead	9.62E+00	6.10E+01	7.06E+01	3.64E+01	2.31E+02	2.67E+02
Manganese	6.83E+00	2.63E+01	3.31E+01	1.08E+01	4.17E+01	5.25E+01
Mercury	7.33E-03	6.77E-02	7.50E-02	2.12E-02	1.95E-01	2.17E-01
Nickel	5.85E-01	2.31E+00	2.89E+00	1.02E+00	4.00E+00	5.02E+00
Selenium	5.10E-03	4.91E-02	5.42E-02	1.01E-02	9.74E-02	1.08E-01
Silver	2.94E-02	2.82E-01	3.12E-01	1.87E-01	1.80E+00	1.99E+00
Thallium	6.31E-03	6.07E-02	6.70E-02	1.66E-02	1.60E-01	1.76E-01
Vanadium	2.51E-01	2.41E+00	2.66E+00	4.00E-01	3.84E+00	4.24E+00
Zinc	1.53E+01	1.02E+03	1.03E+03	4.93E+01	3.27E+03	3.32E+03

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion	Mean Fruit Ingestion	Mean Earthworm Ingestion	Mean Oral Total Dose
Volatile Organics				
Acetone	3.90E-05	NE	1.88E-04	2.27E-04
1,1-Dichloroethene	2.74E-05	4.41E-04	1.32E-04	6.00E-04
1,2-Dichloroethene	3.04E-05	NE	1.46E-04	1.77E-04
Methylene Chloride	4.01E-05	1.32E-03	1.93E-04	1.56E-03
Toluene	3.09E-05	1.52E-04	1.49E-04	3.32E-04
1,1,1-Trichloroethane	2.51E-05	1.68E-04	1.21E-04	3.14E-04
Xylene	2.99E-05	7.27E-05	1.44E-04	2.47E-04
Semivolatile Organics				
Acenaphthene	6.01E-04	6.64E-03	8.66E-04	8.11E-03
Acenaphthylene	6.44E-04	8.72E-04	6.81E-04	2.20E-03
Anthracene	9.84E-04	4.91E-04	2.37E-04	1.71E-03
Benzo(a)anthracene	2.81E-03	3.03E-04	1.35E-03	4.47E-03
Benzo(a)pyrene	2.82E-03	1.65E-04	4.06E-03	7.04E-03
Benzo(b)fluoranthene	3.16E-03	1.85E-04	4.56E-03	7.90E-03
Benzo(g,h,i)perylene	2.31E-03	7.44E-05	2.22E-03	4.61E-03
Benzo(k)fluoranthene	2.14E-03	1.25E-04	3.09E-03	5.35E-03
Bis(2-ethylhexyl)phthalate	1.34E-03	NE	6.44E-03	7.78E-03
Butylbenzylphthalate	1.07E-03	1.22E-04	5.14E-03	6.34E-03
Carbazole	6.89E-04	1.61E-03	3.31E-03	5.61E-03
Chrysene	2.90E-03	3.09E-04	2.79E-03	5.99E-03
Dibenz(a,h)anthracene	1.21E-03	2.64E-05	2.84E-03	4.08E-03
Dibenzofuran	6.54E-04	5.06E-04	3.15E-03	4.31E-03
Diethylphthalate	9.23E-04	6.17E-03	4.44E-03	1.15E-02
Di-N-butylphthalate	8.73E-04	9.42E-05	4.20E-03	5.16E-03
Di-N-octylphthalate	7.41E-04	3.56E-03	3.56E-03	7.86E-03
Fluoranthene	4.03E-03	1.11E-03	1.55E-03	6.69E-03
Fluorene	5.73E-04	3.98E-04	5.51E-04	1.52E-03
Indeno(1,2,3-cd)pyrene	2.10E-03	6.83E-05	4.03E-03	6.19E-03
2-Methylnapthalene	5.98E-04	4.75E-04	5.75E-04	1.65E-03
Naphthalene	5.33E-04	1.24E-03	5.38E-04	2.31E-03
Phenanthrene	2.30E-03	1.63E-01	1.11E-03	1.66E-01
Pyrene	4.25E-03	1.19E-03	1.84E-03	7.28E-03

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion	Mean Fruit Ingestion	Mean Earthworm Ingestion	Mean Oral Total Dose
Pesticides/PCBs				
Aldrin	8.47E-06	2.87E-05	1.02E-05	4.74E-05
alpha-BHC	6.49E-06	6.73E-06	3.12E-05	4.44E-05
Aroclor - 1254	1.96E-04	6.64E-06	9.41E-04	1.14E-03
Aroclor - 1260	2.03E-04	2.78E-06	9.76E-04	1.18E-03
beta-BHC	7.25E-06	7.52E-06	8.72E-06	2.35E-05
DDD	5.83E-05	2.83E-06	5.61E-05	1.17E-04
DDT	1.50E-04	7.37E-06	1.80E-04	3.37E-04
delta-BHC	7.20E-06	5.72E-06	8.66E-06	2.16E-05
Dieldrin	3.42E-05	6.05E-05	4.12E-05	1.36E-04
Endosulfan II	2.64E-05	4.36E-05	3.17E-05	1.02E-04
Endosulfan Sulfate	1.52E-05	2.51E-05	1.83E-05	5.87E-05
Endrin	4.01E-05	4.33E-06	4.82E-05	9.26E-05
Endrin Aldehyde	5.73E-05	6.18E-06	6.88E-05	1.32E-04
Endrin Ketone	2.02E-05	2.18E-06	2.43E-05	4.66E-05
Alpha-chlordane	5.07E-05	1.14E-04	6.10E-05	2.26E-04
Gamma-chlordane	4.06E-05	9.11E-05	4.88E-05	1.80E-04
gamma-BHC	6.85E-06	7.10E-06	8.23E-06	2.22E-05
Heptaclor	9.64E-06	5.14E-06	1.16E-05	2.64E-05
Heptaclor Epoxide	1.01E-05	5.41E-06	1.22E-05	2.77E-05
Methoxyclor	8.07E-05	1.74E-05	9.70E-05	1.95E-04
Dioxins/Furans				
2,3,7,8-TCDD	8.62E-07	4.48E-08	4.15E-06	5.05E-06
Inorganic Analytes				
Aluminum	4.04E+01	1.26E-01	1.94E+02	2.35E+02
Antimony	4.06E-02	5.85E-03	1.95E-01	2.42E-01
Arsenic	1.03E-01	2.99E-03	2.99E-02	1.36E-01
Barium	2.73E+00	1.97E-01	4.72E+00	7.65E+00
Beryllium	9.54E-04	6.88E-06	4.59E-03	5.55E-03
Cadmium	1.87E-02	5.40E-03	1.89E+00	1.91E+00
Chromium(III)	2.05E-01	4.43E-03	2.66E-01	4.75E-01
Cobalt	5.73E-02	1.93E-03	2.76E-01	3.35E-01
Copper	1.68E+00	2.18E+00	2.91E+00	6.78E+00

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion	Mean Fruit Ingestion	Mean Earthworm Ingestion	Mean Oral Total Dose
Cyanide	3.72E-03	1.79E-02	1.79E-02	3.95E-02
Iron	2.97E+02	1.43E+00	5.43E+02	8.42E+02
Lead	3.99E+00	1.34E-01	1.27E+01	1.68E+01
Manganese	2.83E+00	6.81E-01	5.45E+00	8.96E+00
Mercury	3.04E-03	4.53E-03	1.40E-02	2.16E-02
Nickel	2.42E-01	7.00E-02	4.78E-01	7.90E-01
Selenium	2.12E-03	2.54E-04	1.02E-02	1.25E-02
Silver	1.22E-02	5.85E-03	5.85E-02	7.66E-02
Thallium	2.62E-03	1.26E-02	1.26E-02	2.78E-02
Vanadium	1.04E-01	1.50E-03	5.00E-01	6.06E-01
Zinc	6.36E+00	1.01E+00	2.11E+02	2.18E+02

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% Upper Confidence Limit Soil Ingestion	95% Upper Confidence Limit Fruit Ingestion	95% Upper Confidence Limit Earthworm Ingestion	95% Upper Confidence Limit Oral Total Dose
Volatile Organics				
Acetone	4.57E-05	NE	2.20E-04	2.65E-04
1,1-Dichloroethene	3.35E-05	5.39E-04	1.61E-04	7.33E-04
1,2-Dichloroethene	2.54E-05	NE	1.22E-04	1.47E-04
Methylene Chloride	6.39E-05	2.11E-03	3.07E-04	2.48E-03
Toluene	4.31E-05	2.12E-04	2.07E-04	4.63E-04
1,1,1-Trichloroethane	2.54E-05	1.70E-04	1.22E-04	3.17E-04
Xylene	3.04E-05	7.40E-05	1.46E-04	2.51E-04
Semivolatile Organics				
Acenaphthene	1.40E-03	1.55E-02	2.02E-03	1.89E-02
Acenaphthylene	1.40E-03	1.89E-03	1.48E-03	4.77E-03
Anthracene	2.11E-03	1.05E-03	5.07E-04	3.67E-03
Benzo(a)anthracene	1.22E-02	1.31E-03	5.85E-03	1.93E-02
Benzo(a)pyrene	1.07E-02	6.26E-04	1.54E-02	2.68E-02
Benzo(b)fluoranthene	1.25E-02	7.33E-04	1.81E-02	3.13E-02
Benzo(g,h,i)perylene	7.80E-03	2.51E-04	7.50E-03	1.55E-02
Benzo(k)fluoranthene	9.44E-03	5.52E-04	1.36E-02	2.36E-02
Bis(2-ethylhexyl)phthalate	2.01E-03	NE	9.66E-03	1.17E-02
Butylbenzylphthalate	1.47E-03	1.67E-04	7.07E-03	8.71E-03
Carbazole	1.32E-03	3.08E-03	6.34E-03	1.07E-02
Chrysene	1.45E-02	1.54E-03	1.39E-02	3.00E-02
Dibenz(a,h)anthracene	1.95E-03	4.26E-05	4.59E-03	6.58E-03
Dibenzofuran	1.33E-03	1.03E-03	6.39E-03	8.75E-03
Diethylphthalate	6.09E-04	4.07E-03	2.93E-03	7.60E-03
Di-N-butylphthalate	1.58E-03	1.71E-04	7.61E-03	9.36E-03
Di-N-octylphthalate	6.60E-04	3.17E-03	3.17E-03	7.00E-03
Fluoranthene	1.97E-02	5.40E-03	7.59E-03	3.27E-02
Fluorene	1.42E-03	9.88E-04	1.37E-03	3.77E-03
Indeno(1,2,3-cd)pyrene	6.85E-03	2.23E-04	1.32E-02	2.02E-02
2-Methylnapthalene	9.64E-04	7.66E-04	9.27E-04	2.66E-03
Naphthalene	1.13E-03	2.63E-03	1.14E-03	4.89E-03
Phenanthrene	6.70E-03	4.73E-01	3.22E-03	4.83E-01
Pyrene	2.02E-02	5.70E-03	8.76E-03	3.47E-02

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% Upper Confidence Limit Soil Ingestion	95% Upper Confidence Limit Fruit Ingestion	95% Upper Confidence Limit Earthworm Ingestion	95% Upper Confidence Limit Oral Total Dose
Pesticides/PCBs				
Aldrin	1.62E-05	5.50E-05	1.95E-05	9.08E-05
alpha-BHC	1.01E-05	1.05E-05	4.88E-05	6.94E-05
Aroclor - 1254	8.62E-04	2.92E-05	4.15E-03	5.04E-03
Aroclor - 1260	7.15E-04	9.81E-06	3.44E-03	4.16E-03
beta-BHC	1.37E-05	1.42E-05	1.65E-05	4.44E-05
DDD	5.46E-04	2.65E-05	5.25E-04	1.10E-03
DDT	1.15E-03	5.67E-05	1.38E-03	2.59E-03
delta-BHC	1.24E-05	9.88E-06	1.49E-05	3.72E-05
Dieldrin	1.57E-04	2.78E-04	1.89E-04	6.24E-04
Endosulfan II	1.00E-04	1.66E-04	1.21E-04	3.87E-04
Endosulfan Sulfate	2.98E-05	4.93E-05	3.59E-05	1.15E-04
Endrin	1.46E-04	1.57E-05	1.75E-04	3.36E-04
Endrin Aldehyde	2.49E-04	2.68E-05	2.99E-04	5.74E-04
Endrin Ketone	6.53E-05	7.05E-06	7.85E-05	1.51E-04
Alpha-chlordane	2.54E-04	5.69E-04	3.05E-04	1.13E-03
Gamma-chlordane	1.52E-04	3.41E-04	1.83E-04	6.77E-04
gamma-BHC	1.12E-05	1.16E-05	1.34E-05	3.61E-05
Heptaclor	1.92E-05	1.02E-05	2.30E-05	5.24E-05
Heptaclor Epoxide	2.49E-05	1.32E-05	2.99E-05	6.80E-05
Methoxyclor	1.87E-04	4.03E-05	2.25E-04	4.52E-04
Dioxins/Furans				
2,3,7,8-TCDD	2.59E-06	1.34E-07	1.24E-05	1.52E-05
Inorganic Analytes				
Aluminum	4.98E+01	1.56E-01	2.39E+02	2.89E+02
Antimony	9.55E-02	1.38E-02	4.59E-01	5.69E-01
Arsenic	1.85E-01	5.33E-03	5.33E-02	2.43E-01
Barium	4.29E+00	3.09E-01	7.43E+00	1.20E+01
Beryllium	1.82E-03	1.31E-05	8.73E-03	1.06E-02
Cadmium	7.71E-02	2.22E-02	7.79E+00	7.88E+00
Chromium(III)	3.56E-01	7.70E-03	4.62E-01	8.26E-01
Cobalt	8.25E-02	2.78E-03	3.97E-01	4.82E-01
Copper	9.51E+00	1.23E+01	1.65E+01	3.83E+01

Table V - 49

AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% Upper Confidence Limit Soil Ingestion	95% Upper Confidence Limit Fruit Ingestion	95% Upper Confidence Limit Earthworm Ingestion	95% Upper Confidence Limit Oral Total Dose
Cyanide	7.59E-03	3.65E-02	3.65E-02	8.06E-02
Iron	7.55E+02	3.63E+00	1.38E+03	2.14E+03
Lead	1.51E+01	5.08E-01	4.79E+01	6.35E+01
Manganese	4.49E+00	1.08E+00	8.64E+00	1.42E+01
Mercury	8.78E-03	1.31E-02	4.05E-02	6.24E-02
Nickel	4.21E-01	1.21E-01	8.30E-01	1.37E+00
Selenium	4.20E-03	5.05E-04	2.02E-02	2.49E-02
Silver	7.76E-02	3.73E-02	3.73E-01	4.88E-01
Thallium	6.88E-03	3.31E-02	3.31E-02	7.31E-02
Vanadium	1.66E-01	2.39E-03	7.97E-01	9.65E-01
Zinc	2.04E+01	3.24E+00	6.78E+02	7.02E+02

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Shrew Ingestion	Mean Robin Ingestion	Mean Insect Ingestion	Mean Oral Total Dose
Volatile Organics				
Acetone	3.49E-05	3.86E-05	7.42E-07	7.35E-05
1,1-Dichloroethene	2.45E-05	2.71E-05	5.21E-07	5.16E-05
1,2-Dichloroethene	2.72E-05	3.01E-05	5.79E-07	5.73E-05
Methylene Chloride	3.58E-05	3.96E-05	7.62E-07	7.55E-05
Toluene	2.77E-05	3.06E-05	5.89E-07	5.83E-05
1,1,1-Trichloroethane	2.24E-05	2.48E-05	4.78E-07	4.73E-05
Xylene	2.68E-05	2.96E-05	5.69E-07	5.64E-05
Semivolatile Organics				
Acenaphthene	1.66E-02	5.94E-04	3.43E-06	1.72E-02
Acenaphthylene	5.76E-04	6.37E-04	2.70E-06	1.21E-03
Anthracene	8.80E-04	9.73E-04	9.36E-07	1.85E-03
Benzo(a)anthracene	2.51E-03	2.78E-03	5.35E-06	5.29E-03
Benzo(a)pyrene	2.52E-03	2.78E-03	1.61E-05	5.30E-03
Benzo(b)fluoranthene	2.83E-03	3.13E-03	1.80E-05	5.95E-03
Benzo(g,h,i)perylene	2.07E-03	2.29E-03	8.80E-06	4.36E-03
Benzo(k)fluoranthene	1.91E-03	2.12E-03	1.22E-05	4.03E-03
Bis(2-ethylhexyl)phthalate	1.20E-03	1.32E-03	2.55E-05	2.52E-03
Butylbenzylphthalate	9.56E-04	1.06E-03	2.04E-05	2.01E-03
Carbazole	6.16E-04	6.81E-04	1.31E-05	1.30E-03
Chrysene	2.59E-03	2.87E-03	1.10E-05	5.45E-03
Dibenz(a,h)anthracene	1.08E-03	1.19E-03	1.13E-05	2.27E-03
Dibenzofuran	5.85E-04	6.47E-04	1.24E-05	1.23E-03
Diethylphthalate	8.25E-04	9.13E-04	1.76E-05	1.74E-03
Di-N-butylphthalate	7.80E-04	8.63E-04	1.66E-05	1.64E-03
Di-N-octylphthalate	6.62E-04	7.33E-04	1.41E-05	1.39E-03
Fluoranthene	3.61E-03	3.99E-03	6.14E-06	7.59E-03
Fluorene	5.12E-04	5.66E-04	2.18E-06	1.08E-03
Indeno(1,2,3-cd)pyrene	1.87E-03	2.07E-03	1.59E-05	3.95E-03

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Shrew Ingestion	Mean Robin Ingestion	Mean Insect Ingestion	Mean Oral Total Dose
2-Methylnapthalene	5.35E-04	5.92E-04	2.28E-06	1.13E-03
Naphthalene	4.76E-04	5.27E-04	2.13E-06	1.00E-03
Phenanthrene	2.47E-02	2.28E-03	4.38E-06	2.70E-02
Pyrene	3.80E-03	4.20E-03	7.27E-06	8.00E-03
Pesticides/PCBs				
Aldrin	7.57E-06	8.38E-06	4.03E-08	1.60E-05
alpha-BHC	5.80E-06	6.42E-06	1.24E-07	1.22E-05
Aroclor - 1254	1.75E-04	1.07E-02	3.72E-06	1.09E-02
Aroclor - 1260	1.81E-04	1.11E-02	3.86E-06	1.13E-02
beta-BHC	6.49E-06	7.18E-06	3.45E-08	1.37E-05
DDD	5.22E-05	6.35E-04	2.22E-07	6.87E-04
DDT	1.34E-04	1.63E-03	7.12E-07	1.76E-03
delta-BHC	6.44E-06	7.12E-06	3.43E-08	1.36E-05
Dieldrin	3.06E-05	3.39E-05	1.63E-07	6.45E-05
Endosulfan II	2.36E-05	2.61E-05	1.25E-07	4.97E-05
Endosulfan Sulfate	1.36E-05	1.51E-05	7.24E-08	2.87E-05
Endrin	3.58E-05	3.96E-05	1.91E-07	7.55E-05
Endrin Aldehyde	5.12E-05	5.66E-05	2.72E-07	1.08E-04
Endrin Ketone	1.80E-05	2.00E-05	9.60E-08	3.80E-05
Alpha-chlordane	4.54E-05	5.02E-05	2.41E-07	9.55E-05
Gamma-chlordane	3.63E-05	4.01E-05	1.93E-07	7.64E-05
gamma-BHC	6.12E-06	6.77E-06	3.26E-08	1.29E-05
Heptaclor	8.62E-06	4.29E-05	4.58E-08	5.15E-05
Heptaclor Epoxide	9.07E-06	4.52E-05	4.82E-08	5.42E-05
Methoxyclor	7.21E-05	7.98E-05	3.84E-07	1.52E-04
Dioxins/Furans				
2,3,7,8-TCDD	1.89E-05	8.53E-07	1.64E-08	1.98E-05
Inorganic Analytes				
Aluminum	3.61E+01	4.00E+01	7.69E-01	7.61E+01

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Shrew Ingestion	Mean Robin Ingestion	Mean Insect Ingestion	Mean Oral Total Dose
Antimony	3.63E-02	4.01E-02	7.72E-04	7.64E-02
Arsenic	9.25E-02	1.02E-01	1.18E-04	1.95E-01
Barium	2.44E+00	2.70E+00	1.87E-02	5.14E+00
Beryllium	8.53E-04	9.43E-04	1.81E-05	1.80E-03
Cadmium	7.53E-03	5.55E-04	7.48E-03	8.09E-03
Chromium(III)	1.83E-01	2.03E-01	1.05E-03	3.86E-01
Cobalt	5.12E-02	5.67E-02	1.09E-03	1.08E-01
Copper	4.81E-01	9.99E-02	1.15E-02	5.81E-01
Cyanide	3.32E-03	3.68E-03	7.07E-05	7.00E-03
Iron	2.66E+02	2.94E+02	2.15E+00	5.60E+02
Lead	3.56E-01	9.47E-01	5.01E-02	1.30E+00
Manganese	2.53E+00	2.80E+00	2.16E-02	5.34E+00
Mercury	2.72E-03	3.01E-03	5.55E-05	5.72E-03
Nickel	2.17E-01	2.40E-01	1.89E-03	4.57E-01
Selenium	1.89E-03	2.09E-03	4.02E-05	3.98E-03
Silver	1.09E-02	1.20E-02	2.32E-04	2.29E-02
Thallium	2.34E-03	2.59E-03	4.98E-05	4.93E-03
Vanadium	9.30E-02	1.03E-01	1.98E-03	1.96E-01
Zinc	1.42E+00	8.18E-02	8.35E-01	1.50E+00

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% Upper Confidence Limit Shrew Ingestion	95% Upper Confidence Limit Robin Ingestion	95% Upper Confidence Limit Insect Ingestion	95% Upper Confidence Limit Oral Total Dose
Volatile Organics				
Acetone	4.08E-05	4.52E-05	8.68E-07	8.60E-05
1,1-Dichloroethene	2.99E-05	3.31E-05	6.37E-07	6.30E-05
1,2-Dichloroethene	2.27E-05	2.51E-05	4.82E-07	4.78E-05
Methylene Chloride	5.71E-05	6.32E-05	1.22E-06	1.20E-04
Toluene	3.85E-05	4.26E-05	8.20E-07	8.12E-05
1,1,1-Trichloroethane	2.27E-05	2.51E-05	4.82E-07	4.78E-05
Xylene	2.72E-05	3.01E-05	5.79E-07	5.73E-05
Semivolatile Organics				
Acenaphthene	3.87E-02	1.38E-03	7.98E-06	4.01E-02
Acenaphthylene	1.25E-03	1.38E-03	5.85E-06	2.63E-03
Anthracene	1.89E-03	2.09E-03	2.01E-06	3.97E-03
Benzo(a)anthracene	1.09E-02	1.20E-02	2.32E-05	2.29E-02
Benzo(a)pyrene	9.57E-03	1.06E-02	6.11E-05	2.02E-02
Benzo(b)fluoranthene	1.12E-02	1.24E-02	7.15E-05	2.36E-02
Benzo(g,h,i)perylene	6.97E-03	7.71E-03	2.97E-05	1.47E-02
Benzo(k)fluoranthene	8.44E-03	9.33E-03	5.38E-05	1.78E-02
Bis(2-ethylhexyl)phthalate	1.80E-03	1.99E-03	3.82E-05	3.78E-03
Butylbenzylphthalate	1.32E-03	1.46E-03	2.80E-05	2.77E-03
Carbazole	1.18E-03	1.30E-03	2.51E-05	2.48E-03
Chrysene	1.29E-02	1.43E-02	5.51E-05	2.73E-02
Dibenz(a,h)anthracene	1.74E-03	1.93E-03	1.82E-05	3.67E-03
Dibenzofuran	1.19E-03	1.31E-03	2.53E-05	2.50E-03
Diethylphthalate	5.44E-04	6.02E-04	1.16E-05	1.15E-03
Di-N-butylphthalate	1.41E-03	1.57E-03	3.01E-05	2.98E-03
Di-N-octylphthalate	5.90E-04	6.52E-04	1.25E-05	1.24E-03
Fluoranthene	1.76E-02	1.95E-02	3.00E-05	3.71E-02
Fluorene	1.27E-03	1.40E-03	5.40E-06	2.67E-03
Indeno(1,2,3-cd)pyrene	6.12E-03	6.77E-03	5.21E-05	1.29E-02

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% Upper Confidence Limit Shrew Ingestion	95% Upper Confidence Limit Robin Ingestion	95% Upper Confidence Limit Insect Ingestion	95% Upper Confidence Limit Oral Total Dose
2-Methylnapthalene	8.62E-04	9.53E-04	3.67E-06	1.82E-03
Naphthalene	1.01E-03	1.11E-03	4.50E-06	2.12E-03
Phenanthrene	7.18E-02	6.62E-03	1.27E-05	7.85E-02
Pyrene	1.81E-02	2.00E-02	3.47E-05	3.81E-02
Pesticides/PCBs				
Aldrin	1.45E-05	1.61E-05	7.72E-08	3.06E-05
alpha-BHC	9.07E-06	1.00E-05	1.93E-07	1.91E-05
Aroclor - 1254	7.71E-04	4.71E-02	1.64E-05	4.79E-02
Aroclor - 1260	6.39E-04	3.91E-02	1.36E-05	3.97E-02
beta-BHC	1.22E-05	1.35E-05	6.51E-08	2.58E-05
DDD	4.88E-04	5.94E-03	2.08E-06	6.43E-03
DDT	1.03E-03	1.25E-02	5.48E-06	1.36E-02
delta-BHC	1.11E-05	1.23E-05	5.91E-08	2.34E-05
Dieldrin	1.41E-04	1.56E-04	7.48E-07	2.96E-04
Endosulfan II	8.98E-05	9.93E-05	4.78E-07	1.89E-04
Endosulfan Sulfate	2.67E-05	2.95E-05	1.42E-07	5.62E-05
Endrin	1.30E-04	1.44E-04	6.92E-07	2.74E-04
Endrin Aldehyde	2.22E-04	2.46E-04	1.18E-06	4.68E-04
Endrin Ketone	5.84E-05	6.46E-05	3.11E-07	1.23E-04
Alpha-chlordane	2.27E-04	2.51E-04	1.21E-06	4.78E-04
Gamma-chlordane	1.36E-04	1.51E-04	7.24E-07	2.87E-04
gamma-BHC	9.98E-06	1.10E-05	5.31E-08	2.10E-05
Heptaclor	1.71E-05	8.53E-05	9.12E-08	1.02E-04
Heptaclor Epoxide	2.22E-05	1.11E-04	1.18E-07	1.33E-04
Methoxyclor	1.67E-04	1.85E-04	8.90E-07	3.52E-04
Dioxins/Furans				
2,3,7,8-TCDD	5.68E-05	2.56E-06	4.92E-08	5.93E-05
Inorganic Analytes				
Aluminum	4.45E+01	4.92E+01	9.47E-01	9.38E+01

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT EXPOSURE DOSES (mg/kg-day), PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% Upper Confidence Limit Shrew Ingestion	95% Upper Confidence Limit Robin Ingestion	95% Upper Confidence Limit Insect Ingestion	95% Upper Confidence Limit Oral Total Dose
Antimony	8.54E-02	9.45E-02	1.82E-03	1.80E-01
Arsenic	1.65E-01	1.83E-01	2.11E-04	3.48E-01
Barium	3.84E+00	4.24E+00	2.94E-02	8.08E+00
Beryllium	1.62E-03	1.80E-03	3.45E-05	3.42E-03
Cadmium	3.10E-02	2.29E-03	3.08E-02	3.33E-02
Chromium(III)	3.18E-01	3.52E-01	1.83E-03	6.70E-01
Cobalt	7.37E-02	8.16E-02	1.57E-03	1.55E-01
Copper	2.72E+00	5.64E-01	6.51E-02	3.28E+00
Cyanide	6.79E-03	7.51E-03	1.44E-04	1.43E-02
Iron	6.75E+02	7.47E+02	5.46E+00	1.42E+03
Lead	1.35E+00	3.58E+00	1.89E-01	4.93E+00
Manganese	4.02E+00	4.44E+00	3.42E-02	8.46E+00
Mercury	7.85E-03	8.68E-03	1.60E-04	1.65E-02
Nickel	3.76E-01	4.16E-01	3.28E-03	7.93E-01
Selenium	3.76E-03	4.15E-03	7.99E-05	7.91E-03
Silver	6.94E-02	7.68E-02	1.48E-03	1.46E-01
Thallium	6.15E-03	6.81E-03	1.31E-04	1.30E-02
Vanadium	1.48E-01	1.64E-01	3.15E-03	3.12E-01
Zinc	4.57E+00	2.63E-01	2.68E+00	4.83E+00

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**SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Mean Soil Ingestion Hazard Quotient NOAEL	Mean Soil Ingestion Hazard Quotient LOAEL	Mean Earthworm Ingestion Hazard Quotient NOAEL	Mean Earthworm Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Volatile Organics						
Acetone	9.41E-07	1.88E-07	9.05E-06	1.81E-06	9.99E-06	2.00E-06
1,1-Dichloroethene	2.20E-06	NE	2.12E-05	NE	2.34E-05	NE
1,2-Dichloroethene	4.32E-06	4.19E-07	4.15E-05	4.03E-06	4.58E-05	4.45E-06
Methylene Chloride	4.30E-07	3.87E-07	4.13E-06	3.72E-06	4.56E-06	4.10E-06
Toluene	2.87E-06	2.87E-07	2.76E-05	2.76E-06	3.05E-05	3.05E-06
1,1,1-Trichloroethane	1.08E-08	NE	1.04E-07	NE	1.15E-07	NE
Xylene	7.22E-08	NE	6.94E-07	NE	7.66E-07	NE
Semivolatile Organics						
Acenaphthene	8.28E-06	NE	2.39E-05	NE	3.22E-05	NE
Acenaphthylene	NE	NE	NE	NE	NE	NE
Anthracene	2.37E-06	NE	1.14E-06	NE	3.51E-06	NE
Benzo(a)anthracene	4.52E-05	NE	4.35E-05	NE	8.86E-05	NE
Benzo(a)pyrene	1.36E-02	1.36E-03	3.92E-02	3.92E-03	5.28E-02	5.28E-03
Benzo(b)fluoranthene	NE	NE	NE	NE	NE	NE
Benzo(g,h,i)perylene	NE	NE	NE	NE	NE	NE
Benzo(k)fluoranthene	NE	NE	NE	NE	NE	NE
Bis(2-ethylhexyl)phthalate	6.46E-04	6.46E-05	6.21E-03	6.21E-04	6.86E-03	6.86E-04
Butylbenzylphthalate	1.61E-05	9.42E-06	1.55E-04	9.06E-05	1.71E-04	1.00E-04
Carbazole	NE	NE	NE	NE	NE	NE
Chrysene	NE	NE	NE	NE	NE	NE
Dibenz(a,h)anthracene	NE	NE	NE	NE	NE	NE
Dibenzofuran	NE	NE	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE	NE	NE
Di-N-butylphthalate	1.68E-05	3.51E-06	1.62E-04	3.37E-05	1.79E-04	3.72E-05
Di-N-octylphthalate	NE	NE	NE	NE	NE	NE
Fluoranthene	7.78E-05	4.86E-05	5.99E-05	3.74E-05	1.38E-04	8.60E-05
Fluorene	1.11E-05	NE	2.13E-05	NE	3.23E-05	NE

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**SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Mean Soil Ingestion Hazard Quotient NOAEL	Mean Soil Ingestion Hazard Quotient LOAEL	Mean Earthworm Ingestion Hazard Quotient NOAEL	Mean Earthworm Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Indeno(1,2,3-cd)pyrene	NE	NE	NE	NE	NE	NE
2-Methylnapthalene	8.85E-05	8.85E-06	1.70E-04	1.70E-05	2.59E-04	2.59E-05
Naphthalene	3.13E-05	7.22E-06	6.33E-05	1.46E-05	9.46E-05	2.18E-05
Phenanthrene	7.94E-04	7.94E-05	7.63E-04	7.63E-05	1.56E-03	1.56E-04
Pyrene	1.37E-04	NE	1.18E-04	NE	2.55E-04	NE
Pesticides/PCBs						
Aldrin	4.09E-04	1.63E-04	9.82E-04	3.93E-04	1.39E-03	5.56E-04
alpha-BHC	6.26E-06	NE	6.02E-05	NE	6.65E-05	NE
Aroclor - 1254	9.45E-05	NE	9.08E-04	NE	1.00E-03	NE
Aroclor - 1260	7.09E-05	NE	6.82E-04	NE	7.53E-04	NE
beta-BHC	3.50E-04	3.50E-05	8.41E-04	8.41E-05	1.19E-03	1.19E-04
DDD	3.29E-07	NE	6.32E-07	NE	9.61E-07	NE
DDT	1.03E-02	1.03E-03	2.48E-02	2.48E-03	3.51E-02	3.51E-03
delta-BHC	3.47E-04	3.47E-05	8.35E-04	8.35E-05	1.18E-03	1.18E-04
Dieldrin	1.65E-03	6.61E-04	3.97E-03	1.59E-03	5.62E-03	2.25E-03
Endosulfan II	1.27E-05	NE	3.06E-05	NE	4.33E-05	NE
Endosulfan Sulfate	4.89E-05	NE	1.18E-04	NE	1.67E-04	NE
Endrin	3.87E-04	NE	9.29E-04	NE	1.32E-03	NE
Endrin Aldehyde	5.53E-04	NE	1.33E-03	NE	1.88E-03	NE
Endrin Ketone	1.95E-04	NE	4.68E-04	NE	6.63E-04	NE
Alpha-chlordane	1.47E-05	6.00E-06	3.54E-05	1.44E-05	5.02E-05	2.04E-05
Gamma-chlordane	1.63E-04	1.63E-05	3.92E-04	3.92E-05	5.55E-04	5.55E-05
gamma-BHC	8.26E-06	3.30E-06	1.99E-05	7.94E-06	2.81E-05	1.12E-05
Heptaclor	9.30E-04	9.30E-05	2.24E-03	2.24E-04	3.17E-03	3.17E-04
Heptaclor Epoxide	4.08E-05	4.08E-06	9.80E-05	9.80E-06	1.39E-04	1.39E-05
Methoxyclor	6.48E-06	3.89E-06	1.56E-05	9.35E-06	2.21E-05	1.32E-05
Dioxins/Furans						
2,3,7,8-TCDD	1.39E-01	NE	**1.33E+00**	NE	**1.47E+00**	NE

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**SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Mean Soil Ingestion Hazard Quotient NOAEL	Mean Soil Ingestion Hazard Quotient LOAEL	Mean Earthworm Ingestion Hazard Quotient NOAEL	Mean Earthworm Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Inorganic Analytes						
Aluminum	**5.13E+00**	NE	**4.93E+01**	NE	**5.45E+01**	NE
Antimony	1.86E-02	1.86E-03	1.79E-01	1.79E-02	1.98E-01	1.98E-02
Arsenic	3.57E-01	6.34E-02	2.06E-01	3.65E-02	5.62E-01	9.99E-02
Barium	4.70E-02	NE	1.63E-01	NE	2.10E-01	NE
Beryllium	7.42E-05	NE	7.13E-04	NE	7.88E-04	NE
Cadmium	2.58E-01	2.58E-02	**5.21E+01**	**5.21E+00**	**5.24E+01**	**5.24E+00**
Chromium(III)	8.67E-02	8.67E-03	2.25E-01	2.25E-02	3.12E-01	3.12E-02
Cobalt	2.77E-01	2.77E-02	**2.66E+00**	2.66E-01	**2.94E+00**	2.94E-01
Copper	**9.66E+00**	9.66E-01	**3.34E+01**	**3.34E+00**	**4.31E+01**	**4.31E+00**
Cyanide	2.64E-01	2.64E-02	**2.54E+00**	2.54E-01	**2.80E+00**	2.80E-01
Iron	**2.34E+02**	**2.34E+01**	**8.57E+02**	**8.57E+01**	**1.09E+03**	**1.09E+02**
Lead	2.47E-01	NE	**1.56E+00**	NE	**1.81E+00**	NE
Manganese	3.90E-01	3.90E-02	**1.50E+00**	1.50E-01	**1.89E+00**	1.89E-01
Mercury	1.74E-02	1.05E-02	1.61E-01	9.66E-02	1.79E-01	1.07E-01
Nickel	1.17E-01	2.34E-02	4.61E-01	9.22E-02	5.78E-01	1.16E-01
Selenium	5.10E-01	5.10E-02	**4.91E+00**	4.91E-01	**5.42E+00**	5.42E-01
Silver	1.62E-02	1.62E-03	1.56E-01	1.56E-02	1.72E-01	1.72E-02
Thallium	2.53E-02	9.02E-03	2.43E-01	8.67E-02	2.68E-01	9.57E-02
Vanadium	5.02E-01	5.02E-02	**4.82E+00**	4.82E-01	**5.33E+00**	5.33E-01
Zinc	9.59E-02	NE	**6.36E+00**	NE	**6.46E+00**	NE

NE - Not evaluated due to lack of data

Bold numbers indicate a hazard quotient/hazard index greater than one for that SOPC for that medium and/or pathway.

- SOPC presents a potential risk to the shrew.

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**SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	95% UCL Soil Ingestion Hazard Quotient NOAEL	95% UCL Soil Ingestion Hazard Quotient LOAEL	95% UCL Earthworm Ingestion Hazard Quotient NOAEL	95% UCL Earthworm Ingestion Hazard Quotient LOAEL	95% UCL Hazard Index NOAEL	95% UCL Hazard Index LOAEL
Volatile Organics						
Acetone	1.10E-06	2.20E-07	1.06E-05	2.12E-06	1.17E-05	2.34E-06
1,1-Dichloroethene	2.69E-06	NE	2.59E-05	NE	2.86E-05	NE
1,2-Dichloroethene	3.60E-06	3.50E-07	3.46E-05	3.36E-06	3.82E-05	3.71E-06
Methylene Chloride	6.85E-07	6.17E-07	6.59E-06	5.93E-06	7.27E-06	6.55E-06
Toluene	4.00E-06	4.00E-07	3.85E-05	3.85E-06	4.25E-05	4.25E-06
1,1,1-Trichloroethane	1.09E-08	NE	1.05E-07	NE	1.16E-07	NE
Xylene	7.34E-08	NE	7.06E-07	NE	7.79E-07	NE
Semivolatile Organics						
Acenaphthene	1.93E-05	NE	5.56E-05	NE	7.48E-05	NE
Acenaphthylene	NE	NE	NE	NE	NE	NE
Anthracene	5.09E-06	NE	2.45E-06	NE	7.54E-06	NE
Benzo(a)anthracene	1.96E-04	NE	1.88E-04	NE	3.84E-04	NE
Benzo(a)pyrene	5.16E-02	5.16E-03	1.49E-01	1.49E-02	2.01E-01	2.01E-02
Benzo(b)fluoranthene	NE	NE	NE	NE	NE	NE
Benzo(g,h,i)perylene	NE	NE	NE	NE	NE	NE
Benzo(k)fluoranthene	NE	NE	NE	NE	NE	NE
Bis(2-ethylhexyl)phthalate	9.69E-04	9.69E-05	9.32E-03	9.32E-04	1.03E-02	1.03E-03
Butylbenzylphthalate	2.22E-05	1.29E-05	2.13E-04	1.25E-04	2.35E-04	1.37E-04
Carbazole	NE	NE	NE	NE	NE	NE
Chrysene	NE	NE	NE	NE	NE	NE
Dibenz(a,h)anthracene	NE	NE	NE	NE	NE	NE
Dibenzofuran	NE	NE	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE	NE	NE
Di-N-butylphthalate	3.05E-05	6.36E-06	2.94E-04	6.12E-05	3.24E-04	6.75E-05
Di-N-octylphthalate	NE	NE	NE	NE	NE	NE
Fluoranthene	3.81E-04	2.38E-04	2.93E-04	1.83E-04	6.73E-04	4.21E-04
Fluorene	2.74E-05	NE	5.27E-05	NE	8.01E-05	NE

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SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Soil Ingestion Hazard Quotient NOAEL	95% UCL Soil Ingestion Hazard Quotient LOAEL	95% UCL Earthworm Ingestion Hazard Quotient NOAEL	95% UCL Earthworm Ingestion Hazard Quotient LOAEL	95% UCL Hazard Index NOAEL	95% UCL Hazard Index LOAEL
Indeno(1,2,3-cd)pyrene	NE	NE	NE	NE	NE	NE
2-Methylnapthalene	1.43E-04	1.43E-05	2.74E-04	2.74E-05	4.17E-04	4.17E-05
Naphthalene	6.62E-05	1.53E-05	1.34E-04	3.08E-05	2.00E-04	4.61E-05
Phenanthrene	2.31E-03	2.31E-04	2.22E-03	2.22E-04	4.53E-03	4.53E-04
Pyrene	6.51E-04	NE	5.63E-04	NE	1.21E-03	NE
Pesticides/PCBs						
Aldrin	7.83E-04	3.13E-04	1.88E-03	7.53E-04	2.67E-03	1.07E-03
alpha-BHC	9.79E-06	NE	9.41E-05	NE	1.04E-04	NE
Aroclor - 1254	4.16E-04	NE	4.00E-03	NE	4.42E-03	NE
Aroclor - 1260	2.50E-04	NE	2.40E-03	NE	2.65E-03	NE
beta-BHC	6.61E-04	6.61E-05	1.59E-03	1.59E-04	2.25E-03	2.25E-04
DDD	3.08E-06	NE	5.92E-06	NE	9.00E-06	NE
DDT	7.94E-02	7.94E-03	1.91E-01	1.91E-02	2.70E-01	2.70E-02
delta-BHC	6.00E-04	6.00E-05	1.44E-03	1.44E-04	2.04E-03	2.04E-04
Dieldrin	7.59E-03	3.03E-03	1.82E-02	7.29E-03	2.58E-02	1.03E-02
Endosulfan II	4.85E-05	NE	1.16E-04	NE	1.65E-04	NE
Endosulfan Sulfate	9.59E-05	NE	2.31E-04	NE	3.27E-04	NE
Endrin	1.40E-03	NE	3.38E-03	NE	4.78E-03	NE
Endrin Aldehyde	2.40E-03	NE	5.76E-03	NE	8.16E-03	NE
Endrin Ketone	6.30E-04	NE	1.52E-03	NE	2.15E-03	NE
Alpha-chlordane	7.37E-05	3.00E-05	1.77E-04	7.21E-05	2.51E-04	1.02E-04
Gamma-chlordane	6.12E-04	6.12E-05	1.47E-03	1.47E-04	2.08E-03	2.08E-04
gamma-BHC	1.35E-05	5.38E-06	3.24E-05	1.29E-05	4.58E-05	1.83E-05
Heptaclor	1.85E-03	1.85E-04	4.45E-03	4.45E-04	6.30E-03	6.30E-04
Heptaclor Epoxide	9.99E-05	9.99E-06	2.40E-04	2.40E-05	3.40E-04	3.40E-05
Methoxyclor	1.50E-05	9.02E-06	3.62E-05	2.17E-05	5.12E-05	3.07E-05
Dioxins/Furans						
2,3,7,8-TCDD	4.16E-01	NE	**4.00E+00**	NE	**4.42E+00**	NE

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**SHORT-TAILED SHREW MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	95% UCL Soil Ingestion Hazard Quotient NOAEL	95% UCL Soil Ingestion Hazard Quotient LOAEL	95% UCL Earthworm Ingestion Hazard Quotient NOAEL	95% UCL Earthworm Ingestion Hazard Quotient LOAEL	95% UCL Hazard Index NOAEL	95% UCL Hazard Index LOAEL
Inorganic Analytes						
Aluminum	**6.32E+00**	NE	**6.08E+01**	NE	**6.71E+01**	NE
Antimony	4.39E-02	4.39E-03	4.22E-01	4.22E-02	4.66E-01	4.66E-02
Arsenic	6.36E-01	1.13E-01	3.67E-01	6.52E-02	**1.00E+00**	1.78E-01
Barium	7.39E-02	NE	2.56E-01	NE	3.30E-01	NE
Beryllium	1.41E-04	NE	1.36E-03	NE	1.50E-03	NE
Cadmium	**1.06E+00**	1.06E-01	**2.15E+02**	**2.15E+01**	**2.16E+02**	**2.16E+01**
Chromium(III)	1.51E-01	1.51E-02	3.91E-01	3.91E-02	5.42E-01	5.42E-02
Cobalt	3.98E-01	3.98E-02	**3.83E+00**	3.83E-01	**4.22E+00**	4.22E-01
Copper	**5.46E+01**	**5.46E+00**	**1.89E+02**	**1.89E+01**	**2.44E+02**	**2.44E+01**
Cyanide	5.39E-01	5.39E-02	**5.18E+00**	5.18E-01	**5.72E+00**	5.72E-01
Iron	**5.95E+02**	**5.95E+01**	**2.18E+03**	**2.18E+02**	**2.77E+03**	**2.77E+02**
Lead	9.33E-01	NE	**5.92E+00**	NE	**6.86E+00**	NE
Manganese	6.19E-01	6.19E-02	**2.38E+00**	2.38E-01	**3.00E+00**	3.00E-01
Mercury	5.04E-02	3.02E-02	4.65E-01	2.79E-01	5.16E-01	3.09E-01
Nickel	2.03E-01	4.06E-02	8.01E-01	1.60E-01	**1.00E+00**	2.01E-01
Selenium	**1.01E+00**	1.01E-01	**9.74E+00**	9.74E-01	**1.08E+01**	**1.08E+00**
Silver	1.03E-01	1.03E-02	9.94E-01	9.94E-02	**1.10E+00**	1.10E-01
Thallium	6.64E-02	2.37E-02	6.39E-01	2.28E-01	7.05E-01	2.52E-01
Vanadium	7.99E-01	7.99E-02	**7.69E+00**	7.69E-01	**8.49E+00**	8.49E-01
Zinc	3.08E-01	NE	**2.04E+01**	NE	**2.07E+01**	NE

NE - Not evaluated due to lack of data

Bold numbers indicate a hazard quotient/hazard index greater than one for that SOPC for that medium and/or pathway.

- SOPC presents a potential risk to the robin.

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**AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Mean Soil Ingestion Hazard Quotient NOAEL	Mean Soil Ingestion Hazard Quotient LOAEL	Mean Fruit Ingestion Hazard Quotient NOAEL	Mean Fruit Ingestion Hazard Quotient LOAEL
Volatile Organics				
Acetone	7.40E-09	NE	NE	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	4.16E-08	NE	1.01E-07	NE
Semivolatile Organics				
Acenaphthene	1.48E-05	1.48E-06	1.63E-04	1.63E-05
Acenaphthylene	1.58E-05	1.58E-06	2.14E-05	2.14E-06
Anthracene	2.42E-05	2.42E-06	1.21E-05	1.21E-06
Benzo(a)anthracene	6.91E-05	6.91E-06	7.45E-06	7.45E-07
Benzo(a)pyrene	6.92E-05	6.92E-06	4.05E-06	4.05E-07
Benzo(b)fluoranthene	7.77E-05	7.77E-06	4.54E-06	4.54E-07
Benzo(g,h,i)perylene	5.68E-05	5.68E-06	1.83E-06	1.83E-07
Benzo(k)fluoranthene	5.26E-05	5.26E-06	3.08E-06	3.08E-07
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	7.12E-05	7.12E-06	7.58E-06	7.58E-07
Dibenz(a,h)anthracene	2.97E-05	2.97E-06	6.48E-07	6.48E-08
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	9.91E-05	9.91E-06	2.72E-05	2.72E-06
Fluorene	1.41E-05	1.41E-06	9.79E-06	9.79E-07

Table V - 52

AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion Hazard Quotient NOAEL	Mean Soil Ingestion Hazard Quotient LOAEL	Mean Fruit Ingestion Hazard Quotient NOAEL	Mean Fruit Ingestion Hazard Quotient LOAEL
Ideno(1,2,3-cd)pyrene	5.15E-05	5.15E-06	1.68E-06	1.68E-07
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	5.66E-05	5.66E-06	4.00E-03	4.00E-04
Pyrene	1.04E-04	1.04E-05	2.94E-05	2.94E-06
Pesticides/PCBs				
Aldrin	2.82E-04	2.82E-05	9.57E-04	9.57E-05
alpha-BHC	9.55E-06	9.55E-07	9.90E-06	9.90E-07
Aroclor - 1254	7.71E-05	7.71E-06	2.61E-06	2.61E-07
Aroclor - 1260	2.31E-04	2.31E-05	3.17E-06	3.17E-07
beta-BHC	1.07E-05	1.07E-06	1.11E-05	1.11E-06
DDD	1.51E-05	1.51E-06	7.34E-07	7.34E-08
DDT	2.72E-04	2.72E-05	1.34E-05	1.34E-06
delta-BHC	1.06E-05	1.06E-06	8.42E-06	8.42E-07
Dieldrin	1.14E-03	1.14E-04	2.02E-03	2.02E-04
Endosulfan II	8.46E-05	8.46E-06	1.40E-04	1.40E-05
Endosulfan Sulfate	4.88E-05	4.88E-06	8.06E-05	8.06E-06
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	3.60E-04	3.60E-05	8.07E-04	8.07E-05
Gamma-chlordane	2.88E-04	2.88E-05	6.46E-04	6.46E-05
gamma-BHC	1.01E-05	1.01E-06	1.04E-05	1.04E-06
Heptaclor	4.82E-07	4.82E-08	2.57E-07	2.57E-08
Heptaclor Epoxide	5.07E-07	5.07E-08	2.70E-07	2.70E-08
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	8.62E-02	8.62E-03	4.48E-03	4.48E-04

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Soil Ingestion Hazard Quotient NOAEL	Mean Soil Ingestion Hazard Quotient LOAEL	Mean Fruit Ingestion Hazard Quotient NOAEL	Mean Fruit Ingestion Hazard Quotient LOAEL
Inorganic Analytes				
Aluminum	**3.64E+01**	**3.64E+00**	1.14E-01	1.14E-02
Antimony	NE	NE	NE	NE
Arsenic	1.41E-02	NE	4.08E-04	NE
Barium	**1.65E+00**	1.65E-01	1.19E-01	1.19E-02
Beryllium	NE	NE	NE	NE
Cadmium	1.10E-02	1.66E-03	3.18E-03	4.79E-04
Chromium(III)	4.31E-02	NE	9.34E-04	NE
Cobalt	NE	NE	NE	NE
Copper	2.37E-02	NE	3.08E-02	NE
Cyanide	8.26E-02	8.26E-03	3.97E-01	3.97E-02
Iron	**1.01E+01**	NE	4.85E-02	NE
Lead	1.42E-01	NE	4.79E-03	NE
Manganese	6.62E-03	NE	1.59E-03	NE
Mercury	1.19E-01	1.19E-02	1.78E-01	1.78E-02
Nickel	3.40E-04	NE	9.81E-05	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	7.57E-03	7.57E-04	3.64E-02	3.64E-03
Vanadium	NE	NE	NE	NE
Zinc	3.03E-02	1.45E-03	4.81E-03	2.31E-04

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Earthworm Ingestion Hazard Quotient NOAEL	Mean Earthworm Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Volatile Organics				
Acetone	3.56E-08	NE	4.30E-08	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	2.00E-07	NE	3.43E-07	NE
Semivolatile Organics				
Acenaphthene	2.13E-05	2.13E-06	1.99E-04	1.99E-05
Acenaphthylene	1.67E-05	1.67E-06	5.40E-05	5.40E-06
Anthracene	5.81E-06	5.81E-07	4.21E-05	4.21E-06
Benzo(a)anthracene	3.32E-05	3.32E-06	1.10E-04	1.10E-05
Benzo(a)pyrene	9.98E-05	9.98E-06	1.73E-04	1.73E-05
Benzo(b)fluoranthene	1.12E-04	1.12E-05	1.94E-04	1.94E-05
Benzo(g,h,i)perylene	5.47E-05	5.47E-06	1.13E-04	1.13E-05
Benzo(k)fluoranthene	7.59E-05	7.59E-06	1.32E-04	1.32E-05
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	6.84E-05	6.84E-06	1.47E-04	1.47E-05
Dibenz(a,h)anthracene	6.99E-05	6.99E-06	1.00E-04	1.00E-05
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	3.81E-05	3.81E-06	1.64E-04	1.64E-05
Fluorene	1.35E-05	1.35E-06	3.74E-05	3.74E-06

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Earthworm Ingestion Hazard Quotient NOAEL	Mean Earthworm Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Ideno(1,2,3-cd)pyrene	9.90E-05	9.90E-06	1.52E-04	1.52E-05
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	2.72E-05	2.72E-06	4.08E-03	4.08E-04
Pyrene	4.51E-05	4.51E-06	1.79E-04	1.79E-05
Pesticides/PCBs				
Aldrin	3.39E-04	3.39E-05	1.58E-03	1.58E-04
alpha-BHC	4.59E-05	4.59E-06	6.54E-05	6.54E-06
Aroclor - 1254	3.71E-04	3.71E-05	4.50E-04	4.50E-05
Aroclor - 1260	1.11E-03	1.11E-04	1.35E-03	1.35E-04
beta-BHC	1.28E-05	1.28E-06	3.46E-05	3.46E-06
DDD	1.45E-05	1.45E-06	3.04E-05	3.04E-06
DDT	3.27E-04	3.27E-05	6.13E-04	6.13E-05
delta-BHC	1.27E-05	1.27E-06	3.17E-05	3.17E-06
Dieldrin	1.37E-03	1.37E-04	4.53E-03	4.53E-04
Endosulfan II	1.02E-04	1.02E-05	3.26E-04	3.26E-05
Endosulfan Sulfate	5.86E-05	5.86E-06	1.88E-04	1.88E-05
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	4.32E-04	4.32E-05	1.60E-03	1.60E-04
Gamma-chlordane	3.46E-04	3.46E-05	1.28E-03	1.28E-04
gamma-BHC	1.21E-05	1.21E-06	3.26E-05	3.26E-06
Heptaclor	5.79E-07	5.79E-08	1.32E-06	1.32E-07
Heptaclor Epoxide	6.10E-07	6.10E-08	1.39E-06	1.39E-07
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	4.15E-01	4.15E-02	5.05E-01	5.05E-02

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Earthworm Ingestion Hazard Quotient NOAEL	Mean Earthworm Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Inorganic Analytes				
Aluminum	**1.75E+02**	**1.75E+01**	**2.12E+02**	**2.12E+01**
Antimony	NE	NE	NE	NE
Arsenic	4.08E-03	NE	1.86E-02	NE
Barium	**2.86E+00**	2.86E-01	**4.64E+00**	4.64E-01
Beryllium	NE	NE	NE	NE
Cadmium	**1.11E+00**	1.68E-01	**1.13E+00**	1.70E-01
Chromium(III)	5.60E-02	NE	1.00E-01	NE
Cobalt	NE	NE	NE	NE
Copper	4.10E-02	NE	9.55E-02	NE
Cyanide	3.97E-01	3.97E-02	8.77E-01	8.77E-02
Iron	**1.84E+01**	NE	**2.86E+01**	NE
Lead	4.52E-01	NE	5.99E-01	NE
Manganese	1.27E-02	NE	2.09E-02	NE
Mercury	5.50E-01	5.50E-02	8.47E-01	8.47E-02
Nickel	6.70E-04	NE	1.11E-03	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	3.64E-02	3.64E-03	8.03E-02	8.03E-03
Vanadium	NE	NE	NE	NE
Zinc	**1.01E+00**	4.83E-02	**1.04E+00**	4.99E-02

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Soil Ingestion Hazard Quotient NOAEL	95% UCL Soil Ingestion Hazard Quotient LOAEL	95% UCL Fruit Ingestion Hazard Quotient NOAEL	95% UCL Fruit Ingestion Hazard Quotient LOAEL
Volatile Organics				
Acetone	8.66E-09	NE	NE	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	4.23E-08	NE	1.03E-07	NE
Semivolatile Organics				
Acenaphthene	3.43E-05	3.43E-06	3.80E-04	3.80E-05
Acenaphthylene	3.43E-05	3.43E-06	4.65E-05	4.65E-06
Anthracene	5.19E-05	5.19E-06	2.59E-05	2.59E-06
Benzo(a)anthracene	2.99E-04	2.99E-05	3.23E-05	3.23E-06
Benzo(a)pyrene	2.63E-04	2.63E-05	1.54E-05	1.54E-06
Benzo(b)fluoranthene	3.08E-04	3.08E-05	1.80E-05	1.80E-06
Benzo(g,h,i)perylene	1.92E-04	1.92E-05	6.16E-06	6.16E-07
Benzo(k)fluoranthene	2.32E-04	2.32E-05	1.36E-05	1.36E-06
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	3.56E-04	3.56E-05	3.79E-05	3.79E-06
Dibenz(a,h)anthracene	4.79E-05	4.79E-06	1.05E-06	1.05E-07
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	4.85E-04	4.85E-05	1.33E-04	1.33E-05
Fluorene	3.49E-05	3.49E-06	2.43E-05	2.43E-06

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Soil Ingestion Hazard Quotient NOAEL	95% UCL Soil Ingestion Hazard Quotient LOAEL	95% UCL Fruit Ingestion Hazard Quotient NOAEL	95% UCL Fruit Ingestion Hazard Quotient LOAEL
Ideno(1,2,3-cd)pyrene	1.68E-04	1.68E-05	5.48E-06	5.48E-07
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	1.65E-04	1.65E-05	1.16E-02	1.16E-03
Pyrene	4.97E-04	4.97E-05	1.40E-04	1.40E-05
Pesticides/PCBs				
Aldrin	5.41E-04	5.41E-05	1.83E-03	1.83E-04
alpha-BHC	1.49E-05	1.49E-06	1.55E-05	1.55E-06
Aroclor - 1254	3.40E-04	3.40E-05	1.15E-05	1.15E-06
Aroclor - 1260	8.16E-04	8.16E-05	1.12E-05	1.12E-06
beta-BHC	2.01E-05	2.01E-06	2.09E-05	2.09E-06
DDD	1.42E-04	1.42E-05	6.87E-06	6.87E-07
DDT	2.09E-03	2.09E-04	1.03E-04	1.03E-05
delta-BHC	1.83E-05	1.83E-06	1.45E-05	1.45E-06
Dieldrin	5.24E-03	5.24E-04	9.26E-03	9.26E-04
Endosulfan II	3.22E-04	3.22E-05	5.32E-04	5.32E-05
Endosulfan Sulfate	9.56E-05	9.56E-06	1.58E-04	1.58E-05
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	1.80E-03	1.80E-04	4.04E-03	4.04E-04
Gamma-chlordane	1.08E-03	1.08E-04	2.42E-03	2.42E-04
gamma-BHC	1.64E-05	1.64E-06	1.70E-05	1.70E-06
Heptaclor	9.59E-07	9.59E-08	5.11E-07	5.11E-08
Heptaclor Epoxide	1.24E-06	1.24E-07	6.62E-07	6.62E-08
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	2.59E-01	2.59E-02	1.34E-02	1.34E-03

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AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Soil Ingestion Hazard Quotient NOAEL	95% UCL Soil Ingestion Hazard Quotient LOAEL	95% UCL Fruit Ingestion Hazard Quotient NOAEL	95% UCL Fruit Ingestion Hazard Quotient LOAEL
Inorganic Analytes				
Aluminum	**4.49E+01**	**4.49E+00**	1.40E-01	1.40E-02
Antimony	NE	NE	NE	NE
Arsenic	2.52E-02	NE	7.28E-04	NE
Barium	**2.60E+00**	2.60E-01	1.88E-01	1.88E-02
Beryllium	NE	NE	NE	NE
Cadmium	4.54E-02	6.84E-03	1.31E-02	1.97E-03
Chromium(III)	7.50E-02	NE	1.62E-03	NE
Cobalt	NE	NE	NE	NE
Copper	1.34E-01	NE	1.74E-01	NE
Cyanide	1.69E-01	1.69E-02	8.11E-01	8.11E-02
Iron	**2.56E+01**	NE	1.23E-01	NE
Lead	5.39E-01	NE	1.81E-02	NE
Manganese	1.05E-02	NE	2.52E-03	NE
Mercury	3.44E-01	3.44E-02	5.13E-01	5.13E-02
Nickel	5.90E-04	NE	1.70E-04	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	1.99E-02	1.99E-03	9.57E-02	9.57E-03
Vanadium	NE	NE	NE	NE
Zinc	9.73E-02	4.67E-03	1.54E-02	7.41E-04

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**AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	95% UCL Earthworm Ingestion Hazard Quotient NOAEL	95% UCL Earthworm Ingestion Hazard Quotient LOAEL	95% UCL Stressor Hazard Index NOAEL	95% UCL Stressor Hazard Index LOAEL
Volatile Organics				
Acetone	4.17E-08	NE	5.03E-08	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	2.04E-07	NE	3.49E-07	NE
Semivolatile Organics				
Acenaphthene	4.95E-05	4.95E-06	4.64E-04	4.64E-05
Acenaphthylene	3.63E-05	3.63E-06	1.17E-04	1.17E-05
Anthracene	1.25E-05	1.25E-06	9.02E-05	9.02E-06
Benzo(a)anthracene	1.44E-04	1.44E-05	4.75E-04	4.75E-05
Benzo(a)pyrene	3.79E-04	3.79E-05	6.58E-04	6.58E-05
Benzo(b)fluoranthene	4.44E-04	4.44E-05	7.70E-04	7.70E-05
Benzo(g,h,i)perylene	1.84E-04	1.84E-05	3.82E-04	3.82E-05
Benzo(k)fluoranthene	3.34E-04	3.34E-05	5.80E-04	5.80E-05
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	3.42E-04	3.42E-05	7.36E-04	7.36E-05
Dibenz(a,h)anthracene	1.13E-04	1.13E-05	1.62E-04	1.62E-05
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	1.86E-04	1.86E-05	8.04E-04	8.04E-05
Fluorene	3.36E-05	3.36E-06	9.27E-05	9.27E-06

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**AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	95% UCL Earthworm Ingestion Hazard Quotient NOAEL	95% UCL Earthworm Ingestion Hazard Quotient LOAEL	95% UCL Stressor Hazard Index NOAEL	95% UCL Stressor Hazard Index LOAEL
Ideno(1,2,3-cd)pyrene	3.24E-04	3.24E-05	4.97E-04	4.97E-05
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	7.91E-05	7.91E-06	1.19E-02	1.19E-03
Pyrene	2.15E-04	2.15E-05	8.52E-04	8.52E-05
Pesticides/PCBs				
Aldrin	6.50E-04	6.50E-05	3.03E-03	3.03E-04
alpha-BHC	7.17E-05	7.17E-06	1.02E-04	1.02E-05
Aroclor - 1254	1.63E-03	1.63E-04	1.98E-03	1.98E-04
Aroclor - 1260	3.92E-03	3.92E-04	4.75E-03	4.75E-04
beta-BHC	2.42E-05	2.42E-06	6.52E-05	6.52E-06
DDD	1.36E-04	1.36E-05	2.85E-04	2.85E-05
DDT	2.52E-03	2.52E-04	4.71E-03	4.71E-04
delta-BHC	2.20E-05	2.20E-06	5.48E-05	5.48E-06
Dieldrin	6.30E-03	6.30E-04	2.08E-02	2.08E-03
Endosulfan II	3.87E-04	3.87E-05	1.24E-03	1.24E-04
Endosulfan Sulfate	1.15E-04	1.15E-05	3.68E-04	3.68E-05
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	2.16E-03	2.16E-04	8.00E-03	8.00E-04
Gamma-chlordane	1.30E-03	1.30E-04	4.80E-03	4.80E-04
gamma-BHC	1.97E-05	1.97E-06	5.32E-05	5.32E-06
Heptaclor	1.15E-06	1.15E-07	2.62E-06	2.62E-07
Heptaclor Epoxide	1.49E-06	1.49E-07	3.40E-06	3.40E-07
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	**1.24E+00**	1.24E-01	**1.52E+00**	1.52E-01

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**AMERICAN ROBIN MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	95% UCL Earthworm Ingestion Hazard Quotient NOAEL	95% UCL Earthworm Ingestion Hazard Quotient LOAEL	95% UCL Stressor Hazard Index NOAEL	95% UCL Stressor Hazard Index LOAEL
Inorganic Analytes				
Aluminum	**2.16E+02**	**2.16E+01**	**2.61E+02**	**2.61E+01**
Antimony	NE	NE	NE	NE
Arsenic	7.28E-03	NE	3.32E-02	NE
Barium	**4.50E+00**	4.50E-01	**7.29E+00**	7.29E-01
Beryllium	NE	NE	NE	NE
Cadmium	**4.58E+00**	6.91E-01	**4.64E+00**	7.00E-01
Chromium(III)	9.73E-02	NE	1.74E-01	NE
Cobalt	NE	NE	NE	NE
Copper	2.32E-01	NE	5.40E-01	NE
Cyanide	8.11E-01	8.11E-02	**1.79E+00**	1.79E-01
Iron	**4.68E+01**	NE	**7.25E+01**	NE
Lead	**1.71E+00**	NE	**2.27E+00**	NE
Manganese	2.02E-02	NE	3.32E-02	NE
Mercury	**1.59E+00**	1.59E-01	**2.45E+00**	2.45E-01
Nickel	1.16E-03	NE	1.92E-03	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	9.57E-02	9.57E-03	2.11E-01	2.11E-02
Vanadium	NE	NE	NE	NE
Zinc	**3.23E+00**	1.55E-01	**3.34E+00**	1.60E-01

NE - Not evaluated due to lack of data

Bold numbers indicate a hazard quotient/hazard index greater than one for that SOPC for that medium and/or pathway.

- SOPC presents a potential risk to the robin.

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Shrew Ingestion Hazard Quotient NOAEL	Mean Shrew Ingestion Hazard Quotient LOAEL	Mean Robin Ingestion Hazard Quotient NOAEL	Mean Robin Ingestion Hazard Quotient LOAEL
Volatile Organics				
Acetone	6.62E-09	NE	7.32E-09	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	3.72E-08	NE	4.12E-08	NE
Semi-Volatile Organics				
Acenaphthene	4.09E-04	4.09E-05	1.46E-05	1.46E-06
Acenaphthylene	1.42E-05	1.42E-06	1.57E-05	1.57E-06
Anthracene	2.16E-05	2.16E-06	2.39E-05	2.39E-06
Benzo(a)anthracene	6.17E-05	6.17E-06	6.83E-05	6.83E-06
Benzo(a)pyrene	6.18E-05	6.18E-06	6.84E-05	6.84E-06
Benzo(b)fluoranthene	6.94E-05	6.94E-06	7.68E-05	7.68E-06
Benzo(g,h,i)perylene	5.08E-05	5.08E-06	5.62E-05	5.62E-06
Benzo(k)fluoranthene	4.70E-05	4.70E-06	5.20E-05	5.20E-06
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	6.36E-05	6.36E-06	7.04E-05	7.04E-06
Dibenz(a,h)anthracene	2.65E-05	2.65E-06	2.93E-05	2.93E-06
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	8.86E-05	8.86E-06	9.80E-05	9.80E-06
Fluorene	1.26E-05	1.26E-06	1.39E-05	1.39E-06

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Table V - 53

AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Shrew Ingestion Hazard Quotient NOAEL	Mean Shrew Ingestion Hazard Quotient LOAEL	Mean Robin Ingestion Hazard Quotient NOAEL	Mean Robin Ingestion Hazard Quotient LOAEL
Indeno(1,2,3-cd)pyrene	4.60E-05	4.60E-06	5.09E-05	5.09E-06
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	6.07E-04	6.07E-05	5.60E-05	5.60E-06
Pyrene	9.33E-05	9.33E-06	1.03E-04	1.03E-05
Pesticides/PCB				
Aldrin	2.52E-04	2.52E-05	2.79E-04	2.79E-05
alpha-BHC	8.54E-06	8.54E-07	9.44E-06	9.44E-07
Aroclor - 1254	6.89E-05	6.89E-06	4.21E-03	4.21E-04
Aroclor - 1260	2.07E-04	2.07E-05	1.26E-02	1.26E-03
beta-BHC	9.54E-06	9.54E-07	1.06E-05	1.06E-06
DDD	1.35E-05	1.35E-06	1.64E-04	1.64E-05
DDT	2.43E-04	2.43E-05	2.96E-03	2.96E-04
delta-BHC	9.47E-06	9.47E-07	1.05E-05	1.05E-06
Dieldrin	1.02E-03	1.02E-04	1.13E-03	1.13E-04
Endosulfan II	7.56E-05	7.56E-06	8.36E-05	8.36E-06
Endosulfan Sulfate	4.36E-05	4.36E-06	4.82E-05	4.82E-06
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	3.22E-04	3.22E-05	3.56E-04	3.56E-05
Gamma-chlordane	2.57E-04	2.57E-05	2.85E-04	2.85E-05
gamma-BHC	9.00E-06	9.00E-07	9.96E-06	9.96E-07
Heptaclor	4.31E-07	4.31E-08	2.15E-06	2.15E-07
Heptaclor Epoxide	4.54E-07	4.54E-08	2.26E-06	2.26E-07
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	**1.89E+00**	1.89E-01	8.53E-02	8.53E-03

Table V - 53

AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Shrew Ingestion Hazard Quotient NOAEL	Mean Shrew Ingestion Hazard Quotient LOAEL	Mean Robin Ingestion Hazard Quotient NOAEL	Mean Robin Ingestion Hazard Quotient LOAEL
Inorganic Analytes				
Aluminum	**3.26E+01**	**3.26E+00**	**3.60E+01**	**3.60E+00**
Antimony	NE	NE	NE	NE
Arsenic	1.26E-02	NE	1.40E-02	NE
Barium	**1.48E+00**	1.48E-01	**1.64E+00**	1.64E-01
Beryllium	NE	NE	NE	NE
Cadmium	4.43E-03	6.68E-04	3.27E-04	4.93E-05
Chromium(III)	3.86E-02	NE	4.27E-02	NE
Cobalt	NE	NE	NE	NE
Copper	6.78E-03	NE	1.41E-03	NE
Cyanide	7.39E-02	7.39E-03	8.17E-02	8.17E-03
Iron	**9.01E+00**	NE	**9.97E+00**	NE
Lead	1.27E-02	NE	3.38E-02	NE
Manganese	5.92E-03	NE	6.55E-03	NE
Mercury	4.24E-01	4.24E-02	4.70E-01	4.70E-02
Nickel	3.04E-04	NE	3.36E-04	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	6.76E-03	6.76E-04	7.48E-03	7.48E-04
Vanadium	NE	NE	NE	NE
Zinc	6.77E-03	3.25E-04	3.90E-04	1.87E-05

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Insect Ingestion Hazard Quotient NOAEL	Mean Insect Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Volatile Organics				
Acetone	1.41E-10	NE	1.39E-08	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	7.92E-10	NE	7.84E-08	NE
Semi-Volatile Organics				
Acenaphthene	8.42E-08	8.42E-09	4.24E-04	4.24E-05
Acenaphthylene	6.62E-08	6.62E-09	2.98E-05	2.98E-06
Anthracene	2.30E-08	2.30E-09	4.55E-05	4.55E-06
Benzo(a)anthracene	1.31E-07	1.31E-08	1.30E-04	1.30E-05
Benzo(a)pyrene	3.95E-07	3.95E-08	1.30E-04	1.30E-05
Benzo(b)fluoranthene	4.43E-07	4.43E-08	1.46E-04	1.46E-05
Benzo(g,h,i)perylene	2.16E-07	2.16E-08	1.07E-04	1.07E-05
Benzo(k)fluoranthene	3.00E-07	3.00E-08	9.90E-05	9.90E-06
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	2.71E-07	2.71E-08	1.34E-04	1.34E-05
Dibenz(a,h)anthracene	2.76E-07	2.76E-08	5.59E-05	5.59E-06
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	1.51E-07	1.51E-08	1.87E-04	1.87E-05
Fluorene	5.35E-08	5.35E-09	2.65E-05	2.65E-06

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Mean Insect Ingestion Hazard Quotient NOAEL	Mean Insect Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Indeno(1,2,3-cd)pyrene	3.92E-07	3.92E-08	9.69E-05	9.69E-06
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	1.08E-07	1.08E-08	6.63E-04	6.63E-05
Pyrene	1.79E-07	1.79E-08	1.96E-04	1.96E-05
Pesticides/PCB				
Aldrin	1.34E-06	1.34E-07	5.32E-04	5.32E-05
alpha-BHC	1.82E-07	1.82E-08	1.80E-05	1.80E-06
Aroclor - 1254	1.47E-06	1.47E-07	4.28E-03	4.28E-04
Aroclor - 1260	4.40E-06	4.40E-07	1.28E-02	1.28E-03
beta-BHC	5.07E-08	5.07E-09	2.01E-05	2.01E-06
DDD	5.75E-08	5.75E-09	1.78E-04	1.78E-05
DDT	1.29E-06	1.29E-07	3.20E-03	3.20E-04
delta-BHC	5.04E-08	5.04E-09	1.99E-05	1.99E-06
Dieldrin	5.43E-06	5.43E-07	2.15E-03	2.15E-04
Endosulfan II	4.02E-07	4.02E-08	1.59E-04	1.59E-05
Endosulfan Sulfate	2.32E-07	2.32E-08	9.19E-05	9.19E-06
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	1.71E-06	1.71E-07	6.77E-04	6.77E-05
Gamma-chlordane	1.37E-06	1.37E-07	5.42E-04	5.42E-05
gamma-BHC	4.79E-08	4.79E-09	1.90E-05	1.90E-06
Heptaclor	2.29E-09	2.29E-10	2.58E-06	2.58E-07
Heptaclor Epoxide	2.41E-09	2.41E-10	2.71E-06	2.71E-07
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	1.64E-03	1.64E-04	**1.98E+00**	1.98E-01

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**AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL)
HAZARD QUOTIENTS, PHASE II ERA
AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995**

Stressor	Mean Insect Ingestion Hazard Quotient NOAEL	Mean Insect Ingestion Hazard Quotient LOAEL	Mean Stressor Hazard Index NOAEL	Mean Stressor Hazard Index LOAEL
Inorganic Analytes				
Aluminum	6.93E-01	6.93E-02	**6.86E+01**	**6.86E+00**
Antimony	NE	NE	NE	NE
Arsenic	1.61E-05	NE	2.66E-02	NE
Barium	1.13E-02	1.13E-03	**3.11E+00**	3.11E-01
Beryllium	NE	NE	NE	NE
Cadmium	4.40E-03	6.63E-04	4.76E-03	7.17E-04
Chromium(III)	2.22E-04	NE	8.12E-02	NE
Cobalt	NE	NE	NE	NE
Copper	1.62E-04	NE	8.19E-03	NE
Cyanide	1.57E-03	1.57E-04	1.56E-01	1.56E-02
Iron	7.29E-02	NE	**1.90E+01**	NE
Lead	1.79E-03	NE	4.65E-02	NE
Manganese	5.04E-05	NE	1.25E-02	NE
Mercury	8.67E-03	8.67E-04	8.94E-01	8.94E-02
Nickel	2.65E-06	NE	6.40E-04	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	1.44E-04	1.44E-05	1.42E-02	1.42E-03
Vanadium	NE	NE	NE	NE
Zinc	3.98E-03	1.91E-04	7.16E-03	3.44E-04

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Shrew Ingestion Hazard Quotient NOAEL	95% UCL Shrew Ingestion Hazard Quotient LOAEL	95% UCL Robin Ingestion Hazard Quotient NOAEL	95% UCL Robin Ingestion Hazard Quotient LOAEL
Volatile Organics				
Acetone	7.74E-09	NE	8.57E-09	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	3.78E-08	NE	4.19E-08	NE
Semi-Volatile Organics				
Acenaphthene	9.52E-04	9.52E-05	3.40E-05	3.40E-06
Acenaphthylene	3.07E-05	3.07E-06	3.40E-05	3.40E-06
Anthracene	4.64E-05	4.64E-06	5.13E-05	5.13E-06
Benzo(a)anthracene	2.67E-04	2.67E-05	2.96E-04	2.96E-05
Benzo(a)pyrene	2.35E-04	2.35E-05	2.60E-04	2.60E-05
Benzo(b)fluoranthene	2.75E-04	2.75E-05	3.05E-04	3.05E-05
Benzo(g,h,i)perylene	1.71E-04	1.71E-05	1.89E-04	1.89E-05
Benzo(k)fluoranthene	2.07E-04	2.07E-05	2.29E-04	2.29E-05
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	3.18E-04	3.18E-05	3.52E-04	3.52E-05
Dibenz(a,h)anthracene	4.28E-05	4.28E-06	4.73E-05	4.73E-06
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	4.33E-04	4.33E-05	4.79E-04	4.79E-05
Fluorene	3.12E-05	3.12E-06	3.45E-05	3.45E-06

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Shrew Ingestion Hazard Quotient NOAEL	95% UCL Shrew Ingestion Hazard Quotient LOAEL	95% UCL Robin Ingestion Hazard Quotient NOAEL	95% UCL Robin Ingestion Hazard Quotient LOAEL
Indeno(1,2,3-cd)pyrene	1.50E-04	1.50E-05	1.66E-04	1.66E-05
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	1.77E-03	1.77E-04	1.63E-04	1.63E-05
Pyrene	4.45E-04	4.45E-05	4.92E-04	4.92E-05
Pesticides/PCB				
Aldrin	4.84E-04	4.84E-05	5.35E-04	5.35E-05
alpha-BHC	1.33E-05	1.33E-06	1.48E-05	1.48E-06
Aroclor - 1254	3.04E-04	3.04E-05	1.85E-02	1.85E-03
Aroclor - 1260	7.29E-04	7.29E-05	4.45E-02	4.45E-03
beta-BHC	1.80E-05	1.80E-06	1.99E-05	1.99E-06
DDD	1.27E-04	1.27E-05	1.54E-03	1.54E-04
DDT	1.87E-03	1.87E-04	2.28E-02	2.28E-03
delta-BHC	1.63E-05	1.63E-06	1.81E-05	1.81E-06
Dieldrin	4.69E-03	4.69E-04	5.18E-03	5.18E-04
Endosulfan II	2.88E-04	2.88E-05	3.18E-04	3.18E-05
Endosulfan Sulfate	8.55E-05	8.55E-06	9.46E-05	9.46E-06
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	1.61E-03	1.61E-04	1.78E-03	1.78E-04
Gamma-chlordane	9.65E-04	9.65E-05	1.07E-03	1.07E-04
gamma-BHC	1.47E-05	1.47E-06	1.62E-05	1.62E-06
Heptaclor	8.57E-07	8.57E-08	4.27E-06	4.27E-07
Heptaclor Epoxide	1.11E-06	1.11E-07	5.53E-06	5.53E-07
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	**5.68E+00**	5.68E-01	2.56E-01	2.56E-02

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Shrew Ingestion Hazard Quotient NOAEL	95% UCL Shrew Ingestion Hazard Quotient LOAEL	95% UCL Robin Ingestion Hazard Quotient NOAEL	95% UCL Robin Ingestion Hazard Quotient LOAEL
Inorganic Analytes				
Aluminum	**4.01E+01**	**4.01E+00**	**4.44E+01**	**4.44E+00**
Antimony	NE	NE	NE	NE
Arsenic	2.26E-02	NE	2.50E-02	NE
Barium	**2.32E+00**	2.32E-01	**2.57E+00**	2.57E-01
Beryllium	NE	NE	NE	NE
Cadmium	1.82E-02	2.75E-03	1.35E-03	2.03E-04
Chromium(III)	6.70E-02	NE	7.41E-02	NE
Cobalt	NE	NE	NE	NE
Copper	3.83E-02	NE	7.95E-03	NE
Cyanide	1.51E-01	1.51E-02	1.67E-01	1.67E-02
Iron	**2.29E+01**	NE	**2.53E+01**	NE
Lead	4.82E-02	NE	1.28E-01	NE
Manganese	9.38E-03	NE	1.04E-02	NE
Mercury	**1.23E+00**	1.23E-01	**1.36E+00**	1.36E-01
Nickel	5.28E-04	NE	5.84E-04	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	1.78E-02	1.78E-03	1.97E-02	1.97E-03
Vanadium	NE	NE	NE	NE
Zinc	2.17E-02	1.04E-03	1.25E-03	6.01E-05

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Insect Ingestion Hazard Quotient NOAEL	95% UCL Insect Ingestion Hazard Quotient LOAEL	95% UCL Stressor Hazard Index NOAEL	95% UCL Stressor Hazard Index LOAEL
Volatile Organics				
Acetone	1.65E-10	NE	1.63E-08	NE
1,1-Dichloroethene	NE	NE	NE	NE
1,2-Dichloroethene	NE	NE	NE	NE
Methylene Chloride	NE	NE	NE	NE
Toluene	NE	NE	NE	NE
1,1,1-Trichloroethane	NE	NE	NE	NE
Xylene	8.05E-10	NE	7.97E-08	NE
Semi-Volatile Organics				
Acenaphthene	1.96E-07	1.96E-08	9.86E-04	9.86E-05
Acenaphthylene	1.44E-07	1.44E-08	6.47E-05	6.47E-06
Anthracene	4.93E-08	4.93E-09	9.76E-05	9.76E-06
Benzo(a)anthracene	5.69E-07	5.69E-08	5.63E-04	5.63E-05
Benzo(a)pyrene	1.50E-06	1.50E-07	4.95E-04	4.95E-05
Benzo(b)fluoranthene	1.76E-06	1.76E-07	5.80E-04	5.80E-05
Benzo(g,h,i)perylene	7.29E-07	7.29E-08	3.61E-04	3.61E-05
Benzo(k)fluoranthene	1.32E-06	1.32E-07	4.37E-04	4.37E-05
Bis(2-ethylhexyl)phthalate	NE	NE	NE	NE
Butylbenzylphthalate	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE
Chrysene	1.35E-06	1.35E-07	6.70E-04	6.70E-05
Dibenz(a,h)anthracene	4.46E-07	4.46E-08	9.01E-05	9.01E-06
Dibenzofuran	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE
Di-N-butylphthalate	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE
Fluoranthene	7.37E-07	7.37E-08	9.13E-04	9.13E-05
Fluorene	1.33E-07	1.33E-08	6.57E-05	6.57E-06

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AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Insect Ingestion Hazard Quotient NOAEL	95% UCL Insect Ingestion Hazard Quotient LOAEL	95% UCL Stressor Hazard Index NOAEL	95% UCL Stressor Hazard Index LOAEL
Indeno(1,2,3-cd)pyrene	1.28E-06	1.28E-07	3.17E-04	3.17E-05
2-Methylnapthalene	NE	NE	NE	NE
Naphthalene	NE	NE	NE	NE
Phenanthrene	3.13E-07	3.13E-08	1.93E-03	1.93E-04
Pyrene	8.51E-07	8.51E-08	9.36E-04	9.36E-05
Pesticides/PCB				
Aldrin	2.57E-06	2.57E-07	1.02E-03	1.02E-04
alpha-BHC	2.84E-07	2.84E-08	2.81E-05	2.81E-06
Aroclor - 1254	6.46E-06	6.46E-07	1.88E-02	1.88E-03
Aroclor - 1260	1.55E-05	1.55E-06	4.53E-02	4.53E-03
beta-BHC	9.58E-08	9.58E-09	3.79E-05	3.79E-06
DDD	5.38E-07	5.38E-08	1.67E-03	1.67E-04
DDT	9.96E-06	9.96E-07	2.47E-02	2.47E-03
delta-BHC	8.69E-08	8.69E-09	3.44E-05	3.44E-06
Dieldrin	2.49E-05	2.49E-06	9.87E-03	9.87E-04
Endosulfan II	1.53E-06	1.53E-07	6.06E-04	6.06E-05
Endosulfan Sulfate	4.55E-07	4.55E-08	1.80E-04	1.80E-05
Endrin	NE	NE	NE	NE
Endrin Aldehyde	NE	NE	NE	NE
Endrin Ketone	NE	NE	NE	NE
Alpha-chlordane	8.55E-06	8.55E-07	3.39E-03	3.39E-04
Gamma-chlordane	5.13E-06	5.13E-07	2.03E-03	2.03E-04
gamma-BHC	7.80E-08	7.80E-09	3.09E-05	3.09E-06
Heptaclor	4.56E-09	4.56E-10	5.12E-06	5.12E-07
Heptaclor Epoxide	5.91E-09	5.91E-10	6.64E-06	6.64E-07
Methoxyclor	NE	NE	NE	NE
Dioxins/Furans				
2,3,7,8-TCDD	4.92E-03	4.92E-04	**5.93E+00**	5.93E-01

001160.1274

Table V - 53

AMERICAN KESTREL MEAN AND 95% UPPER CONFIDENCE LIMIT (95% UCL) HAZARD QUOTIENTS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	95% UCL Insect Ingestion Hazard Quotient NOAEL	95% UCL Insect Ingestion Hazard Quotient LOAEL	95% UCL Stressor Hazard Index NOAEL	95% UCL Stressor Hazard Index LOAEL
Inorganic Analytes				
Aluminum	8.53E-01	8.53E-02	**8.45E+01**	**8.45E+00**
Antimony	NE	NE	NE	NE
Arsenic	2.88E-05	NE	4.75E-02	NE
Barium	1.78E-02	1.78E-03	**4.90E+00**	4.90E-01
Beryllium	NE	NE	NE	NE
Cadmium	1.81E-02	2.73E-03	1.96E-02	2.96E-03
Chromium(III)	3.85E-04	NE	1.41E-01	NE
Cobalt	NE	NE	NE	NE
Copper	9.17E-04	NE	4.63E-02	NE
Cyanide	3.21E-03	3.21E-04	3.18E-01	3.18E-02
Iron	1.85E-01	NE	**4.82E+01**	NE
Lead	6.77E-03	NE	1.76E-01	NE
Manganese	7.99E-05	NE	1.98E-02	NE
Mercury	2.50E-02	2.50E-03	**2.58E+00**	2.58E-01
Nickel	4.60E-06	NE	1.11E-03	NE
Selenium	NE	NE	NE	NE
Silver	NE	NE	NE	NE
Thallium	3.78E-04	3.78E-05	3.75E-02	3.75E-03
Vanadium	NE	NE	NE	NE
Zinc	1.28E-02	6.13E-04	2.30E-02	1.10E-03

NE - Not evaluated due to lack of data.

Bold numbers indicate a hazard quotient/hazard index greater than one for that SOPC for that medium and/or pathway.

- SOPC presents a potential risk to the kestrel.

001160.1275

Table V - 54

STRESSOR-SPECIFIC RISK-BASED SOIL CONCENTRATIONS FOR UNDEVELOPED LANDFILL MEASUREMENT SPECIES, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Short-Tailed Shrew Stressor Specific RBSC (NOAEL)	Short-Tailed Shrew Stressor Specific RBSC (LOAEL)	American Robin Stressor Specific RBSC (NOAEL)	American Robin Stressor Specific RBSC (LOAEL)	American Kestrel Stressor Specific RBSC (NOAEL)	American Kestrel Stressor Specific RBSC (LOAEL)
Volatile Organics						
Acetone	7.70E+02	3.85E+03	1.79E+05	NE	5.52E+05	NE
1,1-Dichloroethene	2.31E+02	NE	NE	NE	NE	NE
1,2-Dichloroethene	1.31E+02	1.35E+03	NE	NE	NE	NE
Methylene Chloride	1.73E+03	1.92E+03	NE	NE	NE	NE
Toluene	2.00E+02	2.00E+03	NE	NE	NE	NE
1,1,1-Trichloroethane	4.32E+04	NE	NE	NE	NE	NE
Xylene	7.70E+03	NE	1.72E+04	NE	7.53E+04	NE
Semivolatile Organics						
Acenaphthene	3.68E+03	NE	5.94E+02	5.94E+03	2.80E+02	2.80E+03
Acenaphthylene	NE	NE	2.35E+03	2.35E+04	4.26E+03	4.26E+04
Anthracene	5.52E+04	NE	4.61E+03	4.61E+04	4.26E+03	4.26E+04
Benzo(a)anthracene	6.25E+03	NE	5.05E+03	5.05E+04	4.26E+03	4.26E+04
Benzo(a)pyrene	1.05E+01	1.05E+02	3.21E+03	3.21E+04	4.26E+03	4.26E+04
Benzo(b)fluoranthene	NE	NE	3.21E+03	3.21E+04	4.26E+03	4.26E+04
Benzo(g,h,i)perylene	NE	NE	4.02E+03	4.02E+04	4.26E+03	4.26E+04
Benzo(k)fluoranthene	NE	NE	3.21E+03	3.21E+04	4.26E+03	4.26E+04
Bis(2-ethylhexyl)phthalate	3.85E+01	3.85E+02	NE	NE	NE	NE
Butylbenzylphthalate	1.23E+03	2.11E+03	NE	NE	NE	NE
Carbazole	NE	NE	NE	NE	NE	NE
Chrysene	NE	NE	3.88E+03	3.88E+04	4.26E+03	4.26E+04
Dibenz(a,h)anthracene	NE	NE	2.38E+03	2.38E+04	4.26E+03	4.26E+04
Dibenzofuran	NE	NE	NE	NE	NE	NE
Diethylphthalate	NE	NE	NE	NE	NE	NE
Di-N-butylphthalate	9.62E+02	4.62E+03	NE	NE	NE	NE
Di-N-octylphthalate	NE	NE	NE	NE	NE	NE

Table V - 54

STRESSOR-SPECIFIC RISK-BASED SOIL CONCENTRATIONS FOR UNDEVELOPED LANDFILL MEASUREMENT SPECIES, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Short-Tailed Shrew Stressor Specific RBSC (NOAEL)	Short-Tailed Shrew Stressor Specific RBSC (LOAEL)	American Robin Stressor Specific RBSC (NOAEL)	American Robin Stressor Specific RBSC (LOAEL)	American Kestrel Stressor Specific RBSC (NOAEL)	American Kestrel Stressor Specific RBSC (LOAEL)
Fluoranthene	5.77E+03	9.24E+03	4.84E+03	4.84E+04	4.26E+03	4.26E+04
Fluorene	3.50E+03	NE	3.02E+03	3.02E+04	4.26E+03	4.26E+04
Indeno(1,2,3-cd)pyrene	NE	NE	2.71E+03	2.71E+04	4.26E+03	4.26E+04
2-Methylnapthalene	4.56E+02	4.56E+03	NE	NE	NE	NE
Naphthalene	1.11E+03	4.82E+03	NE	NE	NE	NE
Phenanthrene	2.92E+02	2.92E+03	1.11E+02	1.11E+03	6.85E+02	6.85E+03
Pyrene	3.29E+03	NE	4.68E+03	4.68E+04	4.26E+03	4.26E+04
Pesticides/PCBs						
Aldrin	1.20E+00	3.00E+00	1.06E+00	1.06E+01	3.14E+00	3.14E+01
alpha-BHC	1.92E+01	NE	1.96E+01	1.96E+02	7.12E+01	7.12E+02
Aroclor - 1254	3.85E+01	NE	8.57E+01	8.57E+02	9.02E+00	9.02E+01
Aroclor - 1260	5.31E+01	NE	2.97E+01	2.97E+02	3.12E+00	3.12E+01
beta-BHC	1.20E+00	1.20E+01	4.14E+01	4.14E+02	7.12E+01	7.12E+02
DDD	1.20E+04	NE	3.79E+02	3.79E+03	6.46E+01	6.46E+02
DDT	8.40E-01	8.40E+00	4.82E+01	4.82E+02	9.21E+00	9.21E+01
delta-BHC	1.20E+00	1.20E+01	4.47E+01	4.47E+02	7.12E+01	7.12E+02
Dieldrin	1.20E+00	3.00E+00	1.49E+00	1.49E+01	3.14E+00	3.14E+01
Endosulfan II	1.20E+02	NE	1.60E+01	1.60E+02	3.27E+01	3.27E+02
Endosulfan Sulfate	1.80E+01	NE	1.60E+01	1.60E+02	3.27E+01	3.27E+02
Endrin	6.00E+00	NE	NE	NE	NE	NE
Endrin Aldehyde	6.00E+00	NE	NE	NE	NE	NE
Endrin Ketone	6.00E+00	NE	NE	NE	NE	NE
Alpha-chlordane	1.99E+02	4.90E+02	6.25E+00	6.25E+01	1.48E+01	1.48E+02
Gamma-chlordane	1.44E+01	1.44E+02	6.25E+00	6.25E+01	1.48E+01	1.48E+02
gamma-BHC	4.80E+01	1.20E+02	4.14E+01	4.14E+02	7.12E+01	7.12E+02
Heptaclor	6.00E-01	6.00E+00	1.44E+03	1.44E+04	7.38E+02	7.38E+03

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STRESSOR-SPECIFIC RISK-BASED SOIL CONCENTRATIONS FOR UNDEVELOPED LANDFILL MEASUREMENT SPECIES, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Short-Tailed Shrew Stressor Specific RBSC (NOAEL)	Short-Tailed Shrew Stressor Specific RBSC (LOAEL)	American Robin Stressor Specific RBSC (NOAEL)	American Robin Stressor Specific RBSC (LOAEL)	American Kestrel Stressor Specific RBSC (NOAEL)	American Kestrel Stressor Specific RBSC (LOAEL)
Heptaclor Epoxide	1.44E+01	1.44E+02	1.44E+03	1.44E+04	7.38E+02	7.38E+03
Methoxyclor	7.20E+02	1.20E+03	NE	NE	NE	NE
Dioxins/Furans						
2,3,7,8-TCDD	1.15E-04	NE	3.36E-04	3.36E-03	8.60E-05	8.60E-04
Inorganic Analytes						
Aluminum	1.46E+02	NE	3.77E+01	3.77E+02	1.16E+02	1.16E+03
Antimony	4.04E+01	4.04E+02	NE	NE	NE	NE
Arsenic	3.63E+01	2.04E+02	1.10E+03	NE	7.66E+02	NE
Barium	2.56E+03	NE	1.16E+02	1.16E+03	1.73E+02	1.73E+03
Beryllium	2.39E+02	NE	NE	NE	NE	NE
Cadmium	7.05E-02	7.05E-01	3.28E+00	2.17E+01	7.76E+02	5.14E+03
Chromium(III)	1.30E+02	1.30E+03	4.04E+02	NE	4.97E+02	NE
Cobalt	3.85E+00	3.85E+01	NE	NE	NE	NE
Copper	7.69E+00	7.69E+01	3.47E+03	NE	4.05E+04	NE
Cyanide	2.62E-01	2.62E+00	8.36E-01	8.36E+00	4.71E+00	4.71E+01
Iron	5.37E+01	5.37E+02	2.05E+03	NE	3.09E+03	NE
Lead	4.34E+02	NE	1.31E+03	NE	1.69E+04	NE
Manganese	2.95E+02	2.95E+03	2.67E+04	NE	4.48E+04	NE
Mercury	3.36E+00	5.59E+00	7.07E-01	7.07E+00	6.70E-01	6.70E+00
Nickel	8.27E+01	4.13E+02	4.31E+04	NE	7.46E+04	NE
Selenium	7.70E-02	7.70E-01	NE	NE	NE	NE
Silver	1.39E+01	1.39E+02	NE	NE	NE	NE
Thallium	1.92E+00	5.39E+00	6.42E+00	6.42E+01	3.62E+01	3.62E+02
Vanadium	3.85E+00	3.85E+01	NE	NE	NE	NE
Zinc	1.94E+02	NE	1.21E+03	2.51E+04	1.75E+05	3.65E+06

NE - Not evaluated due to lack of data

Table V - 55

COMPARISON OF ANALYTICAL DETECTION LIMITS TO RISK BASED SOIL CONCENTRATIONS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Detection Limit	Short-Tailed Shrew Stressor Specific RBSC (NOAEL)	American Robin Stressor Specific RBSC (NOAEL)	American Kestrel Stressor Specific RBSC (NOAEL)	Invertebrate RBSC	Plantlife RBSC
Volatile Organics						
Acetone	8.90E-02	2.72E+02	1.70E+04	2.00E+05	NE	NE
Chloroform	1.80E-02	2.72E+02	NE	NE	NE	NE
Ethylbenzene	1.80E-02	1.11E+02	NE	NE	NE	NE
Tetrachloroethane	1.80E-02	5.43E+01	NE	NE	NE	NE
Toluene	1.80E-02	7.07E+01	NE	NE	NE	NE
Xylene	1.80E-02	2.72E+03	1.63E+03	2.72E+04	NE	NE
Semivolatile Organics						
Acenaphthene	2.10E+00	1.30E+03	5.64E+01	1.02E+02	NE	NE
Acenaphthylene	8.80E-01	NE	2.23E+02	1.55E+03	NE	NE
Anthracene	5.20E-01	1.95E+04	4.38E+02	1.56E+03	NE	NE
Benzo(a)anthracene	4.20E-01	2.21E+03	4.79E+02	1.56E+03	NE	NE
Benzo(a)pyrene	4.10E-01	3.71E+00	3.04E+02	1.55E+03	NE	NE
Benzo(b)fluoranthene	4.20E-01	NE	3.04E+02	1.55E+03	NE	NE
Benzo(g,h,i)perylene	4.10E-01	NE	3.82E+02	1.55E+03	NE	NE
Benzo(k)fluoranthene	8.60E-01	NE	3.04E+02	1.55E+03	NE	NE
Carbazole	8.60E-01	NE	NE	NE	NE	NE
Chrysene	NND	NE	3.68E+02	1.55E+03	NE	NE
Dibenz(a,h)anthracene	2.10E+00	NE	2.25E+02	1.55E+03	NE	NE
Dibenzofuran	2.10E+00	NE	NE	NE	NE	NE
Diethylphthalate	8.80E-01	NE	NE	NE	NE	NE
Di-N-butylphthalate	2.10E+00	3.40E+02	NE	NE	NE	2.00E+03
Di-N-ocytlphthalate	2.10E+00	NE	NE	NE	NE	NE
Fluoranthene	4.10E-01	2.04E+03	4.59E+02	1.56E+03	NE	NE
Fluorene	2.10E+00	1.23E+03	2.86E+02	1.55E+03	1.73E+02	NE
Indeno(1,2,3-c,d)pyrene	4.20E-01	NE	2.57E+02	1.55E+03	NE	NE
4-Methylphenol	2.10E+00	NE	NE	NE	NE	NE
2-Methylnaphthalene	2.10E+00	1.61E+02	NE	NE	NE	NE
Naphthalene	2.10E+00	3.92E+02	NE	NE	NE	NE
Phenanthrene	5.20E-01	1.03E+02	1.05E+01	2.50E+02	NE	NE
Pyrene	4.20E-01	1.16E+03	4.44E+02	1.56E+03	NE	NE
Pesticides/PCBs						
DDD	5.90E-03	4.22E+03	3.59E+01	2.36E+01	1.50E+00	1.25E+01
DDE	6.10E-03	1.02E+01	3.31E+00	2.40E+00	1.50E+00	1.25E+01
DDT	5.70E-02	2.97E-01	4.57E+00	3.36E+00	1.25E+01	1.25E+01
Endosulfan-II	6.10E-03	4.24E+01	NE	NE	NE	NE
Endrin	6.10E-03	2.12E+00	NE	NE	NE	NE
alpha-Chlordane	1.90E-01	7.03E+01	5.93E-01	5.38E+00	2.25E+00	1.25E+01
gamma-Chlordane	1.90E-01	5.08E+00	5.93E-01	5.38E+00	2.25E+00	1.25E+01
Inorganics						
Aluminum	NND	5.16E+01	3.57E+00	4.20E+01	NE	NE
Antimony	1.44E+01	**1.43E+01**	NE	NE	NE	NE
Arsenic	NND	1.28E+01	1.04E+02	2.80E+02	NE	8.00E+00
Barium	NND	9.05E+02	1.10E+01	6.29E+01	NE	NE
Beryllium	4.20E-01	8.42E+01	NE	NE	NE	5.00E-01

Table V - 55

COMPARISON OF ANALYTICAL DETECTION LIMITS TO RISK BASED SOIL CONCENTRATIONS, PHASE II ERA AGRICULTURE STREET LANDFILL, NEW ORLEANS, LOUISIANA, 1995

Stressor	Detection Limit	Short-Tailed Shrew Stressor Specific RBSC (NOAEL)	American Robin Stressor Specific RBSC (NOAEL)	American Kestrel Stressor Specific RBSC (NOAEL)	Invertebrate RBSC	Plantlife RBSC
Cadmium	8.30E-01	**2.49E-02**	**3.11E-01**	1.47E+02	1.84E+03	2.50E+00
Chromium	NND	4.57E+01	3.83E+01	1.81E+02	NE	3.20E+02
Cobalt	NND	1.36E+00	NE	NE	3.00E+03	NE
Copper	NND	2.72E+00	3.29E+02	1.45E+04	1.31E+02	4.20E+01
Iron	NND	1.90E+01	1.95E+02	1.12E+03	NE	2.13E+03
Lead	NND	1.53E+02	1.24E+02	5.95E+03	5.00E+02	5.00E+01
Manganese	NND	1.04E+02	2.53E+03	1.63E+04	NE	NE
Mercury	1.38E-01	1.18E+00	**6.71E-02**	2.43E-01	NE	**3.00E-03**
Nickel	1.47E+01	2.92E+01	4.09E+03	2.72E+04	2.50E+01	**1.25E+01**
Silver	2.49E+00	4.92E+00	NE	NE	NE	NE
Thallium	1.80E+00	6.79E-01	**1.11E+00**	1.31E+01	NE	NE
Vanadium	1.00E+00	1.36E+00	NE	NE	NE	NE
Zinc	NND	6.85E+01	1.14E+02	4.12E+04	5.00E+01	1.80E+02

NND - No Non-detects.

NE - Not Evaluated Due to Lack of Data.

Bold numbers represent RBSCs which are below the detection limits used for the RRII investigation.

- Represents an SOPC with an RBSC below a selected detection limit.