COVER PAGE

Site Number:	0990555005
Site Name:	Mendota / Black Brother's Co.
Category:	31A / Site Remediation Technical
Document Date:	08/07/2018

Volume 4 of 4

Contents:

Comprehensive Site Investigation Report
Remedial Objectives Report
Remedial Action Plan

THIS PAGE FOR IMAGING PURPOSES

2-4/2

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371578

Section I — GENERATOR (Generator completes all of Section I)

a. Generator Name: NICOR GAS

b. Generating Location: NICOR GAS – Black Bridge Company Site

c. Address: 1844 Ferry Road
Naperville, IL 60563

d. Address: 501 9th Ave
MENDOTA, IL 61342

e. Phone No.: 630-388-2381

f. Phone No.: 630-388-2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name: KEITH BODGER

h. Owner's Phone No.: 630-388-2381

i. Waste Profile No.: OHL01027

j. Description of Waste: Soil Cuttings

	Quantity	Units	TYPE
k. Quantity — Ld 1	15	Y	T
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE: D – DRUM, T – TRUCK, O – OTHER
UNITS: Y – YARDS, O – OTHER

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

TOTAL VOLUME: 15

Generator Authorized Agent Name: Micah Jones

Signature: [signature]

Shipment Date: 09 30 11

Section II — TRANSPORTER (Generator completes a-d; Transporter I completes c-g; Transporter II completes h-n.)

TRANSPORTER I

a. Name: SET Environmental

b. Address: 450 Sumac Road
Wheeling IL 60090

c. Driver Name/Title: (PRINT/TYPE)

d. Phone No.: 847-537-9221 e. Truck No.: 1216

f. Vehicle License No./State: P503005

Acknowledgement of Receipt of Materials

g. Driver Signature: [signature]

Shipment Date: 09 30 11

TRANSPORTER II

h. Name:

i. Address:

j. Driver Name/Title: (PRINT/TYPE)

k. Phone No.: l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials

n. Driver Signature:

Shipment Date:

Section III — DESTINATION (Generator completes a-d; destination site completes e-f)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.

b. Physical Address: 8290 Hwy 251
Davis Junction, IL 61020

c. Phone No.: 815-874-9000

d. Mailing Address: SAME

IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name of Authorized Agent: [signature]

Signature: [signature]

Receipt Date: 09 30 11

Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

20-37

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371580

Section I — **GENERATOR** (Generator completes all of Section I)

a. Generator Name: NICOR GAS

b. Generating Location: NICOR GAS - Black Brothers Company Site

c. Address: 1844 Ferry Road, Naperville, IL 60563

d. Address: 501 9th Ave, MENDOTA, IL 61342

e. Phone No.: 630-388-2381

f. Phone No.: 630-388-2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name: KEITH BODGER

h. Owner's Phone No.: 630-388-2381

i. Waste Profile No.: OHL01027

j. Description of Waste: Soil Cuttings

	Quantity	Units	TYPE
k. Quantity — Ld 1	15	Y	T
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE: D – DRUM, T – TRUCK, O – OTHER

UNITS: Y – YARDS, O – OTHER

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

TOTAL VOLUME: 15 CY

Megan Jones — Generator Authorized Agent Name

Signature

Shipment Date: 10/4/11

Section II — **TRANSPORTER** (Generator completes a-d; Transporter I completes e-g; Transporter II completes h-n)

TRANSPORTER I

a. Name: SET Environmental

b. Address: 450 Sumac Road, Wheeling IL 60090

c. Driver Name/Title:

d. Phone No.: 847-537-9221 (PRINT/TYPE) e. Truck No. 1216

f. Vehicle License No./State: 25325

Acknowledgement of Receipt of Materials

g. Driver Signature — Shipment Date: 10/4/11

TRANSPORTER II

h. Name:

i. Address:

j. Driver Name/Title:

k. Phone No.: (PRINT/TYPE) l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials

n. Driver Signature — Shipment Date

Section III — **DESTINATION** (Generator completes a-d; destination site completes e-f)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.

b. Physical Address: 8290 Hwy 251, Davis Junction, IL 61020

c. Phone No.: 815-874-9000

d. Mailing Address: SAME

IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent — Signature — Receipt Date: 10/4/11

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

Set 12/12

20-45

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371581

Section I — GENERATOR (Generator completes all of Section I)

a. Generator Name: NICOR GAS

b. Generating Location: NICOR GAS—Black Bottom Co Site

c. Address: 1844 Ferry Road
Naperville, IL 60563

d. Address: 501 9th Ave
MENDOTA, IL 61342

e. Phone No.: 630-388-2381

f. Phone No.: 630-388-2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name: KEITH BODGER

h. Owner's Phone No.: 630-388-2381

	Quantity	Units	TYPE
k. Quantity — Ld 1	16	Y	Y
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE: D – DRUM; T – TRUCK; O – OTHER

UNITS: Y – YARDS; O – OTHER

i. Waste Profile No.: OHL01027

j. Description of Waste: Soil Cuttings

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

TOTAL VOLUME: 16 yd

Megan Jones — Generator Authorized Agent Name

Signature

Shipment Date: 11/03/11

Section II — TRANSPORTER (Generator completes a-d, Transporter I completes e-g, Transporter II completes h-n)

TRANSPORTER I

a. Name: SET Environmental

b. Address: 450 Sumec Road
Wheeling IL 60090

c. Driver Name/Title: Gary Sumet

d. Phone No.: 847-537-9221 (PRINT/TYPE) e. Truck No.: 106

f. Vehicle License No./State: PS 32725

Acknowledgement of Receipt of Materials.

g. Driver Signature — Shipment Date: 11/03/11

TRANSPORTER II

h. Name:

i. Address:

j. Driver Name/Title:

k. Phone No.: (PRINT/TYPE) l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials.

n. Driver Signature — Shipment Date

Section III — DESTINATION (Generator completes a-d, destination site completes e-f)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.

c. Phone No.: 815-874-9000

b. Physical Address: 8290 Hwy 251
Davis Junction, IL 61020

d. Mailing Address: SAME

IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent — Signature — Receipt Date: 11/15/11

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

202-11 BTLL

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371582

Section I — GENERATOR (Generator completes all of Section I)

a. Generator Name: NICOR GAS – Black Brothers Company Site
b. Generating Location: NICOR GAS – Black Brothers Company Site
c. Address: 1844 Ferry Road, Naperville, IL 60563
d. Address: 501 9th Ave, MENDOTA, IL 61342
e. Phone No.: 630-388-2381
f. Phone No.: 630-388-2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name: KEITH BODGER
h. Owner's Phone No.: 630-388-2381

i. Waste Profile No.: OHL01027
j. Description of Waste: Soil Cuttings

	Quantity	Units	TYPE
k. Quantity – Ld 1	15	Y	X
Quantity – Ld 2			
Quantity – Ld 3			
Quantity – Ld 4			

TYPE: D – DRUM, T – TRUCK, O – OTHER
UNITS: Y – YARDS, O – OTHER

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

TOTAL VOLUME: 15 YD

Megan Jones for Nicor — Generator Authorized Agent Name
Megan Jones — Signature
10/05/11 — Shipment Date

Section II — TRANSPORTER (Generator completes a-d. Transporter I completes e-g. Transporter II completes h-n.)

TRANSPORTER I

a. Name: SET Environmental
b. Address: 450 Sumac Road, Wheeling IL 60090
c. Driver Name/Title:
d. Phone No.: 847-537-9221 (PRINT/TYPE) e. Truck No.: 1219
f. Vehicle License No./State: P40 5041

Acknowledgement of Receipt of Materials

g. Driver Signature
10/05/11 — Shipment Date

TRANSPORTER II

h. Name:
i. Address:
j. Driver Name/Title:
k. Phone No. (PRINT/TYPE) l. Truck No.:
m. Vehicle License No./State:

Acknowledgement of Receipt of Materials

n. Driver Signature
Shipment Date

Section III — DESTINATION (Generator completes a-d; destination site completes e-f)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.
b. Physical Address: 8290 Hwy 251, Davis Junction, IL 61020
c. Phone No.: 815-874-9000
d. Mailing Address: SAME
IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent
Signature
10/05/11 — Receipt Date

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

SET 1214

8/16/7

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371584

Section I — GENERATOR (Generator completes all of Section I)

a. Generator Name: NICOR GAS

b. Generating Location: NICOR GAS – Black Partners Company S/C

c. Address: 1844 Ferry Road
Naperville, IL 60563

d. Address: 501 9th Ave
MENDOTA, IL 61342

e. Phone No.: 630-388-2381

f. Phone No.: 630-388-2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name: KEITH RODGER

h. Owner's Phone No.: 630-388-2381

i. Waste Profile No.: OHL01027 – 244

j. Description of Waste: Soil Cuttings

	Quantity	Units	TYPE
k. Quantity — Ld 1	12	Y	T
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE: D – DRUM; T – TRUCK; O – OTHER

UNITS: Y – YARDS; O – OTHER

TOTAL VOLUME: 12Y

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Megan Jones for Nicor — Generator Authorized Agent Name

Signature

Shipment Date: 12/21/

Section II — TRANSPORTER (Generator completes a-d; Transporter I completes c-g, Transporter II completes h-n)

TRANSPORTER I

a. Name: SET Environmental

b. Address: 450 Sumac Road
Wheeling IL 60090

c. Driver Name/Title: [illegible] (PRINT/TYPE)

d. Phone No.: 847-537-9221

e. Truck No.: 1222

f. Vehicle License No./State: P448346

Acknowledgement of Receipt of Materials.

g. Driver Signature

Shipment Date: 12/21/

TRANSPORTER II

h. Name:

i. Address:

j. Driver Name/Title: (PRINT/TYPE)

k. Phone No.:

l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials.

n. Driver Signature

Shipment Date

Section III — DESTINATION (Generator completes a-d; destination site completes e-l)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.

b. Physical Address: 8290 Hwy 251
Davis Junction, IL 61020

c. Phone No.: 815-874-9000

d. Mailing Address: SAME

IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent

Signature

Receipt Date

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain | CANARY – Return to Generator | PINK – Transporter Retain | GOLD – Generator Retain

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371585

Section I — GENERATOR (Generator completes all of Section I)

a. Generator Name: NICOR GAS

b. Generating Location: NICOR GAS - Blue Rock Gas Storage Site

c. Address: 1844 Ferry Road
Naperville, IL 60563

d. Address: 501 9th Ave
MENDOTA, IL 61342

e. Phone No.: 630-388-2381

f. Phone No.: 630-388-2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name: KEITH BODGER

h. Owner's Phone No.: 630-388-2381

i. Waste Profile No.: OHI 01027

j. Description of Waste: Soil Cuttings

	Quantity	Units	TYPE
k. Quantity — Ld 1	12	Y	
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE: D - DRUM; T - TRUCK; O - OTHER

UNITS: Y - YARDS; O - OTHER

TOTAL VOLUME: 12

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Megan Jones for Nicor — Generator Authorized Agent Name

Signature

Shipment Date

Section II — TRANSPORTER (Generator completes a-d. Transporter I completes c-g. Transporter II completes h-n.)

TRANSPORTER I

a. Name: SET Environmental

b. Address: 450 Sumac Road
Wheeling IL 60090

c. Driver Name/Title: Gary Sue

d. Phone No.: 847-537-8221 (PRINT/TYPE) e. Truck No.: 1216

f. Vehicle License No./State: 05 03825

Acknowledgement of Receipt of Materials.

g. Driver Signature — Shipment Date

TRANSPORTER II

h. Name:

i. Address:

j. Driver Name/Title:

k. Phone No.: (PRINT/TYPE) l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials.

n. Driver Signature — Shipment Date

Section III — DESTINATION (Generator completes a-d. destination site completes e-f)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.

b. Physical Address: 8290 Hwy 251
Davis Junction, IL 61020

c. Phone No.: 815-874-9000

d. Mailing Address: SAME

IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent — Signature — Receipt Date

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371590

Section I — GENERATOR (Generator completes all of Section I)

a. Generator Name: Nicor Gas

b. Generating Location: Blue Island

c. Address: [illegible] Rd
[illegible] IL 60463

d. Address: 501 9th Ave
Maywood IL

e. Phone No.: [illegible] 388 2381

f. Phone No.: [illegible] 388 2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name:

h. Owner's Phone No.:

i. Waste Profile No.: OHL01002 HH

j. Description of Waste: [illegible]

	Quantity	Units	TYPE
k. Quantity — Ld 1	15	Y	T
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE: D – DRUM; T – TRUCK; O – OTHER

UNITS: Y – YARDS; O – OTHER

TOTAL VOLUME: [illegible] yards

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

[illegible] Nicor — Signature — Shipment Date: 02 01 11

Generator Authorized Agent Name

Section II — TRANSPORTER (Generator completes a-d; Transporter I completes c-g; Transporter II completes h-n)

TRANSPORTER I

a. Name: [illegible] Environmental

b. Address: [illegible] Rd
[illegible] IL 60490

c. Driver Name/Title: [illegible]

d. Phone No.: [illegible] e. Truck No.: [illegible]

PRINT/TYPE

f. Vehicle License No./State: [illegible]

Acknowledgement of Receipt of Materials.

g. Driver Signature — Shipment Date: 02 01 11

TRANSPORTER II

h. Name: [illegible] Environmental

i. Address: [illegible] Street
Wilmington IL 60[illegible]

j. Driver Name/Title: [illegible]

k. Phone No.: [illegible] l. Truck No.: [illegible]

PRINT/TYPE

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials.

n. Driver Signature — Shipment Date: 02 02 11

Section III — DESTINATION (Generator completes a-d; destination site completes e-f)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.

b. Physical Address: 8290 Hwy 251
Davis Junction, IL 61020

c. Phone No.: 815-874-9000

d. Mailing Address: SAME

IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent — Signature — Receipt Date: [illegible]

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

VEOLIA ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

No. 371589

Section I — GENERATOR (Generator completes all of Section I)

a. Generator Name: NICOR GAS

b. Generating Location: NICOR GAS - Black Brothers Co.

c. Address: 1844 Ferry Road
Naperville, IL 60563

d. Address: 501 9th Ave
MENDOTA, IL 61342

e. Phone No.: 630 388 2381

f. Phone No.: 630 388 2381

If owner of the generating facility differs from the generator, provide:

g. Owner's Name: KEITH BODGER

h. Owner's Phone No.: 630 388 2381

i. Waste Profile No.: OHL01027

j. Description of Waste: Soil Cuttings

	Quantity	Units	TYPE
k. Quantity — Ld 1	6	Y	T
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE
D – DRUM
T – TRUCK
O – OTHER

UNITS
Y – YARDS
O – OTHER

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

TOTAL VOLUME: 6Y

Generator Authorized Agent Name: Angel Cuevas for Nicor

Signature

Shipment Date: 7/30/12

Section II — TRANSPORTER (Generator completes a-d; Transporter I completes c-g, Transporter II completes h-n)

TRANSPORTER I

a. Name: SET Environmental

b. Address: 450 Stimac Road
Wheeling Il. 60090

c. Driver Name/Title:

d. Phone No.: 847 537 9221 (PRINT/TYPE) e. Truck No.: 222

f. Vehicle License No./State: 1 [illegible] IL

Acknowledgement of Receipt of Materials.

g. Driver Signature

Shipment Date: 7/30/12

TRANSPORTER II

h. Name:

i. Address:

j. Driver Name/Title:

k. Phone No.: (PRINT/TYPE) l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials.

n. Driver Signature

Shipment Date

Section III — DESTINATION (Generator completes a-d; destination site completes e-l)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.

b. Physical Address: 8290 Hwy 251
Davis Junction, IL 61020

c. Phone No.: 815-874-9000

d. Mailing Address: SAME

IEPA Site No.: 1410175005

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent

Signature

Receipt Date

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

VEOLIA
ENVIRONMENTAL SERVICES

CERTIFIED NON-SPECIAL WASTE MANIFEST

20-48

974346

No. 371609

Section I **GENERATOR** (Generator completes all of Section I)

a. Generator Name: NICOR GAS
b. Generating Location: NICOR GAS
c. Address: 1844 Ferry Road, Naperville, IL 60563
d. Address: 501 9th Ave, MENDOTA, IL 61342
e. Phone No.: 630-388-2381
f. Phone No.: 630-388-2381

If owner of the generating facility differs from the generator, provide:
g. Owner's Name: KEITH BODGER
h. Owner's Phone No.: 630-388-2381

i. Waste Profile No.: OHL01027 - 244
j. Description of Waste: Soil Cuttings

	Quantity	Units	TYPE
k. Quantity — Ld 1	10	Y	T
Quantity — Ld 2			
Quantity — Ld 3			
Quantity — Ld 4			

TYPE: D – DRUM, T – TRUCK, O – OTHER
UNITS: Y – YARDS, O – OTHER

*GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

TOTAL VOLUME: 10 Y

Angel Camacho for N.C.
Generator Authorized Agent Name — Signature — Shipment Date 040513

Section II **TRANSPORTER** (Generator completes a-d; Transporter I completes c-g, Transporter II completes h-n)

TRANSPORTER I

a. Name: SET Environmental
b. Address: 450 Sumac Road, Wheeling IL 60090
c. Driver Name/Title: Michael Netzel Driver
d. Phone No.: 847-537-9221 (PRINT/TYPE) e. Truck No.: 1222
f. Vehicle License No./State: P794260 IL
Acknowledgement of Receipt of Materials.
g. Driver Signature — Shipment Date 040513

TRANSPORTER II

h. Name:
i. Address:
j. Driver Name/Title:
k. Phone No.: (PRINT/TYPE) l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials.
n. Driver Signature — Shipment Date

Section III **DESTINATION** (Generator completes a-d; destination site completes e-f)

a. Site Name: Veolia ES Orchard Hills Landfill, Inc.
b. Physical Address: 8290 Hwy 251, Davis Junction, IL 61020
c. Phone No.: 815-874-9000
d. Mailing Address: SAME
IEPA Site No.: 1410175005
e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name Authorized Agent — Signature — Receipt Date 040513

* Shipper refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

WHITE – Destination Retain CANARY – Return to Generator PINK – Transporter Retain GOLD – Generator Retain

Set 1222

liquid ENVIRONMENTAL SOLUTIONS

UNIFORM WASTE PROFILE

866 • 694 • 7327
www.liquidenviro.com

Profile #:
Account #:
◯ Approved ◯ Non-Approved

Profile Information

US EPA ID#: ILD005144787 State ID#: 0990555005 TCEQ ID#(TX-Only): ◉ Analytical Attached ◯ MSDS Attached

Generator Information

Name: Nicor Gas - Black Brothers Company Site
Address: 501 9th Ave
City: Mendota State: IL Zip: 61342
Contact: Keith Bodger Title:
Phone: (630) 388-2381 Fax:
Email:

Billing Information

Name: SET Environmental
Address: 450 Sumac Road
City: Wheeling State: IL Zip: 60090
Contact: Star Sualeh Title:
Phone: (847) 537-9221 Fax:
Email:

Waste Questionnaire (Check all that apply)

Non-hazardous Waste	Yes	No	Unkown
1) Is the waste hazardous by: Ignitability? (40 CFR Part 261.21)	◯	◉	◯
Corrosivity? (40 CFR Part 261.21)	◯	◉	◯
Reactivity? (40 CFR Part 261.21)	◯	◉	◯
Toxicity? (40 CFR Part 261.21)	◯	◉	◯
2) Does the waste contain: Herbicides, pesticides, insecticides?	◯	◉	◯
Dioxins?	◯	◉	◯
Radioactive substances?	◯	◉	◯
Domestic Wastes?	◯	◉	◯
Biohazardous materials?	◯	◉	◯
3) Is this a hazardous waste (F, K, U, or P listed) as defined by 40 CFR 261 Subpart D? If yes to the above, identify the listing.	◯	◉	◯
4) Is the waste derived from outside an underground storage tank (UST)?	◯	◉	◯
5) If waste is derived from fuel, is the fuel leaded?	◯	◉	◯
Used Oil (as defined by CFR 279.1)			
1) Has this used oil been mixed with hazardous waste?	◯	◯	◯
2) Does this used oil contain chlorinated paraffins? If yes, attach MSDS	◯	◯	◯
3) Does this used oil contain TSCA (40 CFR 761) regulated levels of PCB? If yes, list PCB level:	◯	◯	◯
4) Does this used oil contain greater(>) than 1,000 mg/L Total Organic Halogens (TOX)? * If yes, rebuttal per 40 CFR 279.10(b)(1)(ii) must be included.	◯	◯	◯
5) Is this used oil soluble in water?	◯	◯	◯

Virgin Product (must include MSDS)	Yes	No	Unkown
1) Has this product been mixed with a hazardous waste?	◯	◉	◯
Off-Spec Product (must include MSDS)			
1) Has this product been mixed with a hazardous waste?	◯	◉	◯
Petroleum Contact Water (PCW)/Leaking Underground Storage Tank (Lust) Water	◯	◉	◯
Conditional Exempt Small Quantity Generator (CESQG)	◯	◉	◯

Waste Description

Common Name of Waste: Weste water

Process Generating Waste: Water removed from site remediation.

Other Process Information:

Unused Product or Chemical	◯	◉	◯
Waste by-product from process	◯	◉	◯
Spill Clean Up	◯	◉	◯
Planned Site Remediation	◯	◉	◯
Representative Sample Provided	◯	◉	◯

Waste Stream Composition (Total Must Equal 100%)

Major Components	Concentration Range		
Water	100	00	00

◯ 100% Solid Without Free Liquid
◉ 100% Liquid With No Solids
◯ Liquid/Solid Mixture
_____ % Free Liquid
_____ % Settled Solids
_____ % Total Suspended Solids

◉ Single Phase ◯ Bi-Layered ◯ Multi Layered

◯ <2 ◉ 8-12.5 ◯ 2-6 ◯ >12.5 ◯ 6-8 ◯ N/A

◯ <73 F ◯ 141-200 F ◯ 73-100 F ◯ >200 F ◯ 101-140 F ◉ N/A

Range: _____ To: _____
Describe: muddy

◉ None ◯ Mild ◯ Strong
Describe:

◉ Low ◯ Medium ◯ High

◯ Class I ◯ Class II ◯ Other:

TX-Only: Process Knowledge in Lieu of TCLP Analysis (Check Tests Not Needed)

◯ TCLP Metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver)
◯ TCLP Semivolitiles (o-Cresol, m-Cresol, p-Cresol, Cresol (total) 2-4 Dinitrotoluene, Hexachlorobenzene, Hexacchlorobutadiene, Hexachlorethane, Nitrobenzene, Pentachlorophenol, Pyridine, 2-4-5 Trichlorophenol, and 2-4-6 Trichlorophenol)
◯ TCEQ Appendix 1 (TAC 31, Section 335-Subchapter R) or Total Petroleum Table 1, Constituents Hydrocarbons)
◯ TCLP Herbicides/ Pesticides (Chlordane, 2-4 Endrin, Heptachlor, Heptachlor epoxide, Lindane, Methoxyclor, Toxaphene, and 2-4-5 TP/Silvex)
◯ TCLP Volatiles (Benzene, Carbon Tetrachloride, Chlorobenzene, Chloroform, Methyl Ethyl Ketone, 1-4 Dichlorobenzene, 1-2 Dichloroethane, 1-1 Dichloroethylene, Trichloroethylene, Tetrachloroethylene, and Vinyl Chloride)
◯ RCI (Reactive Cyanide, Reactive Sulfide, Corrosivity, Ignitability

Transportation Information

Method of Shipment: ◯ Bulk Liquid ◯ Bulk Sludge ◯ Bulk Solid ◯ Drum/Box ◉ Other: 275 gallon totes
Shipment Frequency: ◉ One Time ◯ Weekly ◯ Monthly ◯ Quarterly ◯ Annually ◯ Other:
Anticipated Volume: 550 gallons

Generator Certification

By signing this profile sheet, the generator (or representative) certifies that all information submitted on this profile and attached documents is correct to the best of my knowledge. In addition, I certify the following: 1) This waste does not contain regulated quantities of PCB's (polychlorinated Biphenyls). 2) This waste is not hazardous by reference to local state law or by reference to US EPA rules 40 CFR Part 261 Subpart C. 3) This profile sheet and its attachments contain true and accurate descriptions of the waste material. 4) relevant information regarding known or suspected hazards in the possession of the generator have been disclosed. 5) The generator will promptly notify LES of any material chang in the composition of the waste which could result in the waste otherwise being characterized as hazardous pursuant to US EPA rules. 6) The generator will not deliver or arrange fo delivery waste material to LES that does not conform to the description in the profile. 7) A representative sample initiates a chain of custody.

Keith Bodger — Generator Authorization Signature
Date: 10/31/11
Keith Bodger Environmental Consultant — Print Name and Title

LES Rev: 08/01/

847-537-9255

Liquid
ENVIRONMENTAL
SOLUTIONS

November 2, 2011

Angel
SET Environmental, Inc.
450 Sumac Road
Wheeling Illinois

Re: MATERIAL PROFILE APPROVAL #: 034011
Waste Water
Nicor Gas - Black Brothers Company Site
501 9th ave
Mendota Illinois
IL Facility ID #: 0990555005

This letter is in response to your submission of a material profile form to LES for approval and acceptance. LES would like to inform you that your material profile form has been approved for acceptance at our facility located at:

12123 South Stony Island Avenue Chicago, IL 60633
IL EPA # 0316550007 US EPA # ILR 000 115 287

When shipping this material to our facility, you must ship with a Uniform Hazardous Waste Manifest. Be sure to include the generator's IL Facility ID Number on the manifest. Also, please reference the MATERIAL PROFILE APPROVAL # on your manifest. The MPA # should be written in the additional information block of the manifest. This approval applies only to the material referenced on the profile form. All other material must be profiled separately. To schedule this load into our facility, you may contact me at (773) 646-9700, or customer service at (800) 447-3592.

This approval is valid for one year. Upon expiration of this profile, you will be prompted to re-certify the profile. Re-certification may include a profile review, re-sample and analysis of the waste stream, or submission of more current material safety data sheets and/or laboratory analyticals. If you have any questions concerning this approval number, please do not hesitate to call. LES appreciates the opportunity to serve you.

Sincerely,

Tom Reeder
General Manager

12123 South Stony Island Avenue
Chicago, IL 60633
Ph. 773-646-9700
Fax 773-646-9730

1640 Talleyrand Avenue
Jacksonville, FL 32206
Ph. 904-354-0372
Fax 904-354-7612

1980 Avenue "A"
Mobile, AL 36615
Ph. 251-694-7500
Fax 251-694-7508

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditation Numbers: IEPA ELAP 100445; ORELAP IL300001;AIHA 101160; NVLAP LabCode 101202-

October 25, 2011

Burns & McDonnell
1431 Opus Place
Suite 400
Downers Grove, IL 60515
Telephone: (630) 724-3200
Fax: (630) 724-3201

RE: 57618, Black Brother Company Site STAT Project No: 11100535

Dear Joe Chittet:

STAT Analysis received 1 sample for the referenced project on 10/18/2011 6:25:00 PM. The analytical results are presented in the following report.

All analyses were performed in accordance with the requirements of 35 IAC Part 186 / NELAC standards. Analyses were performed in accordance with methods as referenced on the analytical report. Those analytical results expressed on a dry weight basis are also noted on the analytical report.

All analyses were performed within established holding time criteria, and all Quality Control criteria met EPA or laboratory specifications except when noted in the Case Narrative or Analytical Report. If required, an estimate of uncertainty for the analyses can be provided. A listing of accredited methods/parameters can also be provided.

Thank you for the opportunity to serve you and I look forward to working with you in the future. If you have any questions regarding the enclosed materials, please contact me at (312) 733-0551.

Sincerely,

Katelin Lewis

Katelin Lewis
Project Manager

The information contained in this report and any attachments is confidential information intended only for the use of the individual or entities named above. The results of this report relate only to the samples tested. If you have received this report in error, please notify us immediately by phone. This report shall not be reproduced, except in its entirety, unless written approval has been obtained from the laboratory. This analytical report shall become property of the Customer upon payment in full. Otherwise, STAT will be under no obligation to support, defend or discuss the analytical report.

STAT Analysis Corporation

Date: October 25, 2011

Client: Burns & McDonnell
Project: 57618, Black Brother Company Site
Lab Order: 11100535

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
11100535-001A	MEN-WWC-101811		10/18/2011 1:40:00 PM	10/18/2011
11100535-001B	MEN-WWC-101811		10/18/2011 1:40:00 PM	10/18/2011
11100535-001C	MEN-WWC-101811		10/18/2011 1:40:00 PM	10/18/2011
11100535-001D	MEN-WWC-101811		10/18/2011 1:40:00 PM	10/18/2011
11100535-001E	MEN-WWC-101811		10/18/2011 1:40:00 PM	10/18/2011
11100535-001F	MEN-WWC-101811		10/18/2011 1:40:00 PM	10/18/2011

STAT Analysis Corporation **Date:** *October 25, 2011*

CLIENT:	Burns & McDonnell	
Project:	57618, Black Brother Company Site	**CASE NARRATIVE**
Lab Order:	11100535	

Please refer to Analytical QC Summary Report for QC outliers.

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATInfo@STATAnalysis.com
Accreditation Numbers: IEPA ELAP 100445; ORELAP IL300001; AIHA 101160; NVLAP LabCode 101202

Date Reported: October 25, 2011
Date Printed: October 25, 2011

Client: Burns & McDonnell
Lab Order: 11100535
Project: 57618, Black Brother Company Site
Lab ID: 11100535-001

Client Sample ID: MEN-WWC-101811
Collection Date: 10/18/2011 1:40:00 PM
Matrix: Water

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
TCLP Mercury		SW1311/7470A		Prep Date: 10/20/2011		Analyst: LB
Mercury	ND	0.0002		mg/L	1	10/20/2011
TCLP Metals by ICP/MS		SW1311/6020 (SW3005A)		Prep Date: 10/20/2011		Analyst: JG
Arsenic	0.024	0.01		mg/L	5	10/20/2011
Barium	1.1	0.5		mg/L	5	10/20/2011
Cadmium	ND	0.005		mg/L	5	10/20/2011
Chromium	0.027	0.01		mg/L	5	10/20/2011
Lead	0.0097	0.005		mg/L	5	10/20/2011
Selenium	ND	0.01		mg/L	5	10/20/2011
Silver	ND	0.01		mg/L	5	10/20/2011
Semivolatile Organic Compounds by GC/MS		SW8270C-SIM (SW3510C)		Prep Date: 10/21/2011		Analyst: VS
Acenaphthene	0.1	0.1		mg/L	10	10/25/2011
Acenaphthylene	0.32	0.1		mg/L	10	10/25/2011
Anthracene	0.3	0.1		mg/L	10	10/25/2011
Benz(a)anthracene	0.16	0.01		mg/L	10	10/25/2011
Benzo(a)pyrene	0.14	0.01		mg/L	10	10/25/2011
Benzo(b)fluoranthene	0.12	0.01		mg/L	10	10/25/2011
Benzo(g,h,i)perylene	0.051	0.01		mg/L	1	10/24/2011
Benzo(k)fluoranthene	0.038	0.001		mg/L	1	10/24/2011
Chrysene	0.13	0.01		mg/L	10	10/25/2011
Dibenz(a,h)anthracene	0.029	0.001		mg/L	1	10/24/2011
Fluoranthene	0.53	0.1		mg/L	10	10/25/2011
Fluorene	0.35	0.1		mg/L	10	10/25/2011
Indeno(1,2,3-cd)pyrene	0.058	0.001		mg/L	1	10/24/2011
Naphthalene	2.3	1		mg/L	100	10/25/2011
Phenanthrene	0.99	0.1		mg/L	10	10/25/2011
Pyrene	0.41	0.1		mg/L	10	10/25/2011
Carbazole	0.09	0.001		mg/L	1	10/24/2011
Dibenzofuran	0.27	0.1		mg/L	10	10/25/2011
2,4-Dinitrotoluene	ND	0.001		mg/L	1	10/24/2011
2,6-Dinitrotoluene	ND	0.001		mg/L	1	10/24/2011
N-Nitrosodi-n-propylamine	ND	0.001		mg/L	1	10/24/2011
Nitrobenzene	ND	0.01		mg/L	1	10/24/2011
Pentachlorophenol	0.0091	0.005		mg/L	1	10/24/2011
Semivolatile Organic Compounds by GC/MS		SW8270C (SW3510C)		Prep Date: 10/21/2011		Analyst: DM
Aniline	ND	0.005		mg/L	1	10/24/2011
Benzidine	ND	0.005		mg/L	1	10/24/2011
Benzoic acid	ND	0.025		mg/L	1	10/24/2011

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditation Numbers: IEPA ELAP 100445; ORELAP IL300001; AIHA 101160; NVLAP LabCode 101202

Date Reported: October 25, 2011
Date Printed: October 25, 2011

Client: Burns & McDonnell
Lab Order: 11100535
Project: 57618, Black Brother Company Site
Lab ID: 11100535-001

Client Sample ID: MEN-WWC-101811
Collection Date: 10/18/2011 1:40:00 PM
Matrix: Water

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Semivolatile Organic Compounds by GC/MS	**SW8270C (SW3510C)**			Prep Date: **10/21/2011**		Analyst: **DM**
Benzyl alcohol	ND	0.005		mg/L	1	10/24/2011
Bis(2-chloroethoxy)methane	ND	0.005		mg/L	1	10/24/2011
Bis(2-chloroethyl)ether	ND	0.005		mg/L	1	10/24/2011
Bis(2-ethylhexyl)phthalate	ND	0.005		mg/L	1	10/24/2011
4-Bromophenyl phenyl ether	ND	0.005		mg/L	1	10/24/2011
Butyl benzyl phthalate	ND	0.005		mg/L	1	10/24/2011
4-Chloroaniline	ND	0.005		mg/L	1	10/24/2011
4-Chloro-3-methylphenol	ND	0.005		mg/L	1	10/24/2011
2-Chloronaphthalene	ND	0.005		mg/L	1	10/24/2011
2-Chlorophenol	ND	0.005		mg/L	1	10/24/2011
4-Chlorophenyl phenyl ether	ND	0.005		mg/L	1	10/24/2011
Dibenzofuran	0.027	0.005		mg/L	1	10/24/2011
1,2-Dichlorobenzene	ND	0.005		mg/L	1	10/24/2011
1,3-Dichlorobenzene	ND	0.005		mg/L	1	10/24/2011
1,4-Dichlorobenzene	ND	0.005		mg/L	1	10/24/2011
3,3'-Dichlorobenzidine	ND	0.01		mg/L	1	10/24/2011
2,4-Dichlorophenol	ND	0.005		mg/L	1	10/24/2011
Diethyl phthalate	ND	0.005		mg/L	1	10/24/2011
2,4-Dimethylphenol	0.023	0.005		mg/L	1	10/24/2011
Dimethyl phthalate	ND	0.005		mg/L	1	10/24/2011
4,6-Dinitro-2-methylphenol	ND	0.025		mg/L	1	10/24/2011
2,4-Dinitrophenol	ND	0.025		mg/L	1	10/24/2011
Di-n-butyl phthalate	ND	0.005		mg/L	1	10/24/2011
Di-n-octyl phthalate	ND	0.005		mg/L	1	10/24/2011
Hexachlorobenzene	ND	0.005		mg/L	1	10/24/2011
Hexachlorobutadiene	ND	0.005		mg/L	1	10/24/2011
Hexachlorocyclopentadiene	ND	0.005		mg/L	1	10/24/2011
Hexachloroethane	ND	0.005		mg/L	1	10/24/2011
Isophorone	ND	0.005		mg/L	1	10/24/2011
2-Methylnaphthalene	0.12	0.005		mg/L	1	10/24/2011
2-Methylphenol	0.014	0.005		mg/L	1	10/24/2011
4-Methylphenol	0.017	0.005		mg/L	1	10/24/2011
2-Nitroaniline	ND	0.025		mg/L	1	10/24/2011
3-Nitroaniline	ND	0.025		mg/L	1	10/24/2011
4-Nitroaniline	ND	0.025		mg/L	1	10/24/2011
2-Nitrophenol	ND	0.005		mg/L	1	10/24/2011
4-Nitrophenol	ND	0.025		mg/L	1	10/24/2011
N-Nitrosodimethylamine	ND	0.005		mg/L	1	10/24/2011

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditation Numbers: IEPA ELAP 100445; ORELAP IL300001; AIHA 101160; NVLAP LabCode 101202

Date Reported: October 25, 2011
Date Printed: October 25, 2011

Client: Burns & McDonnell
Lab Order: 11100535
Project: 57618, Black Brother Company Site
Lab ID: 11100535-001

Client Sample ID: MEN-WWC-101811
Collection Date: 10/18/2011 1:40:00 PM
Matrix: Water

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Semivolatile Organic Compounds by GC/MS	**SW8270C (SW3510C)**			Prep Date: **10/21/2011**		Analyst: **DM**
N-Nitrosodiphenylamine	ND	0.005		mg/L	1	10/24/2011
2, 2'-oxybis(1-Chloropropane)	ND	0.005		mg/L	1	10/24/2011
Phenol	0.012	0.005		mg/L	1	10/24/2011
Pyridine	ND	0.005		mg/L	1	10/24/2011
1,2,4-Trichlorobenzene	ND	0.005		mg/L	1	10/24/2011
2,4,5-Trichlorophenol	ND	0.01		mg/L	1	10/24/2011
2,4,6-Trichlorophenol	ND	0.005		mg/L	1	10/24/2011
Volatile Organic Compounds by GC/MS	**SW8260B (SW5030B)**			Prep Date:		Analyst: **EJH**
Acetone	ND	0.1		mg/L	5	10/22/2011
Benzene	0.11	0.025		mg/L	5	10/22/2011
Bromodichloromethane	ND	0.025		mg/L	5	10/22/2011
Bromoform	ND	0.025		mg/L	5	10/22/2011
Bromomethane	ND	0.05		mg/L	5	10/22/2011
2-Butanone	ND	0.1		mg/L	5	10/22/2011
Carbon disulfide	ND	0.05		mg/L	5	10/22/2011
Carbon tetrachloride	ND	0.025		mg/L	5	10/22/2011
Chlorobenzene	ND	0.025		mg/L	5	10/22/2011
Chloroethane	ND	0.05		mg/L	5	10/22/2011
Chloroform	ND	0.025		mg/L	5	10/22/2011
Chloromethane	ND	0.05		mg/L	5	10/22/2011
Dibromochloromethane	ND	0.025		mg/L	5	10/22/2011
1,1-Dichloroethane	ND	0.025		mg/L	5	10/22/2011
1,2-Dichloroethane	ND	0.025		mg/L	5	10/22/2011
1,1-Dichloroethene	ND	0.025		mg/L	5	10/22/2011
cis-1,2-Dichloroethene	ND	0.025		mg/L	5	10/22/2011
trans-1,2-Dichloroethene	ND	0.025		mg/L	5	10/22/2011
1,2-Dichloropropane	ND	0.025		mg/L	5	10/22/2011
cis-1,3-Dichloropropene	ND	0.005		mg/L	5	10/22/2011
trans-1,3-Dichloropropene	ND	0.005		mg/L	5	10/22/2011
Ethylbenzene	ND	0.025		mg/L	5	10/22/2011
2-Hexanone	ND	0.1		mg/L	5	10/22/2011
4-Methyl-2-pentanone	ND	0.1		mg/L	5	10/22/2011
Methylene chloride	ND	0.025		mg/L	5	10/22/2011
Methyl tert-butyl ether	ND	0.025		mg/L	5	10/22/2011
Styrene	ND	0.025		mg/L	5	10/22/2011
1,1,2,2-Tetrachloroethane	ND	0.025		mg/L	5	10/22/2011
Tetrachloroethene	ND	0.025		mg/L	5	10/22/2011
Toluene	0.081	0.025		mg/L	5	10/22/2011

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditation Numbers: IEPA ELAP 100445; ORELAP IL300001; AIHA 101160; NVLAP LabCode 101202

Date Reported: October 25, 2011
Date Printed: October 25, 2011

Client: Burns & McDonnell
Lab Order: 11100535
Project: 57618, Black Brother Company Site
Lab ID: 11100535-001

Client Sample ID: MEN-WWC-101811
Collection Date: 10/18/2011 1:40:00 PM
Matrix: Water

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds by GC/MS	**SW8260B (SW5030B)**			Prep Date:		Analyst: **EJH**
1,1,1-Trichloroethane	ND	0.025		mg/L	5	10/22/2011
1,1,2-Trichloroethane	ND	0.025		mg/L	5	10/22/2011
Trichloroethene	ND	0.025		mg/L	5	10/22/2011
Vinyl chloride	ND	0.01		mg/L	5	10/22/2011
Xylenes, Total	0.1	0.075		mg/L	5	10/22/2011
Sulfide	**4500S2,C,D**			Prep Date:		Analyst: **SUB**
Sulfide	ND	0.05	*	mg/L	1	10/21/2011
Cyanide, Total	**SW9012A**			Prep Date: **10/19/2011**		Analyst: **YZ**
Cyanide	0.66	0.01		mg/L	1	10/19/2011
Flash Point (Closed Cup)	**SW1010**			Prep Date: **10/19/2011**		Analyst: **RW**
Flashpoint	No flash up to 212			°F	1	10/19/2011
pH	**E150.1**			Prep Date: **10/18/2011**		Analyst: **MNG**
pH	10.0			pH units	1	10/18/2011
Phenolics	**SW9066 (SW9065)**			Prep Date: **10/20/2011**		Analyst: **YZ**
Phenolics, Total Recoverable	0.89	0.05		mg/L	5	10/20/2011

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

Burns & McDonnell

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Engineering
1431 Opus Place
Downers Grove, Illinois 60515
Phone: (630) 724-3200 Fax: (630) 724-3201

Attention: Joe Chittet

Laboratory: STAT Analysis Corporation
Address: 2242 West Harrison Street
City/State/ZIP: Chicago, IL 60612
Telephone: (312) 733-0551

Document Control No.: MEN
Lab. Reference No. or Episode

Project Number: 57618

Site Name: Black Brother's Company Site

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Sample Type: Matrix: Liquid	Sample Type: Matrix: Solid	Sample Type: Matrix: Gas	Number of Containers	Parameter/Method Code: Open Cup Flashpoint	TCL VOCs	TCL SVOCs	Total Phen	TCLP	
MEN-	WWC-	101811	—	—	—	—	10/18/11	1340	X			8	X	X	X	X	X	X

10/18/11

Sampler (signature):

Sampler (signature):

Custody Seal Number
MEN-119351
MEN-119352

Special Instructio
STANDARD TAT

Relinquished By (signature): 1.
Date/Time 10/18/11 1532
Received By (signature):
Date/Time 10/18/11 1332
Ice Present in Container: Yes [✓] No [ ]
Temperature

Relinquished By (signature): 2.
Date/Time 10/18/11 2:20
Received By (signature):
Date/Time 10/18/11 1825
Laboratory Comments:

STAT Analysis Corporation

Sample Receipt Checklist

Client Name B&M

Date and Time Received: 10/18/2011 6:25:00 PM

Work Order Number 11100535

Received by: JJM

Checklist completed by: Signature 10/18 Date

Reviewed by: KL Initials 10/20/11 Date

Matrix:

Carrier name STAT Analysis

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels/containers?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container or Temp Blank temperature in compliance?	Yes ☑	No ☐	Temperature 0.4 °C
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐
Water - Samples pH checked?	Yes ☑	No ☐	Checked by: JJM
Water - Samples properly preserved?	Yes ☐	No ☑	pH Adjusted? Yes

Any No response must be detailed in the comments section below.

Comments: No H_2SO_4 Preserved bottle was submitted for Total Phenolics Analysis, therefore one was prepared in lab.

Client / Person contacted: _____ Date contacted: _____ Contacted by: _____

Response: _____

STAT Analysis Corporation

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site
Test No: SW8260B **Matrix:** W

QC SUMMARY REPORT SURROGATE RECOVERIES

Sample ID	BR4FBZ	BZMED8	DBFM	DCA12D4				
VBLK102111A-3	101	99.8	103	98.2				
VLCS102111A-3	103	103	105	95.1				
VLCSD102111A-3	106	103	105	95.9				
11100535-001A:5	104	101	105	95.3				
11100544-003AMS	103	103	105	101				
11100544-003AMSD	104	103	104	95.5				

Acronym		Surrogate	QC Limits
BR4FBZ	=	4-Bromofluorobenzene	86-115
BZMED8	=	Toluene-d8	88-110
DBFM	=	Dibromofluoromethane	86-118
DCA12D4	=	1,2-Dichloroethane-d4	80-120

*** Surrogate recovery outside acceptance limit**

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: R75839

Sample ID: VBLK102111A-3 | SampType: MBLK | TestCode: VOC_W+ | Units: mg/L | Prep Date: | Run ID: VOA-3_111021B
Client ID: ZZZZZ | Batch ID: R75839 | TestNo: SW8260B | Analysis Date: 10/21/2011 | SeqNo: 2035132

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane	ND	0.0050									
1,1,2,2-Tetrachloroethane	ND	0.0050									
1,1,2-Trichloroethane	ND	0.0050									
1,1-Dichloroethane	ND	0.0050									
1,1-Dichloroethene	ND	0.0050									
1,2-Dichloroethane	ND	0.0050									
1,2-Dichloropropane	ND	0.0050									
2-Butanone	ND	0.020									
2-Hexanone	ND	0.020									
4-Methyl-2-pentanone	ND	0.020									
Acetone	ND	0.020									
Benzene	ND	0.0050									
Bromodichloromethane	ND	0.0050									
Bromoform	ND	0.0050									
Bromomethane	ND	0.010									
Carbon disulfide	0.00055	0.010									J
Carbon tetrachloride	ND	0.0050									
Chlorobenzene	ND	0.0050									
Chloroethane	ND	0.010									
Chloroform	ND	0.0050									
Chloromethane	ND	0.010									
cis-1,2-Dichloroethene	ND	0.0050									
cis-1,3-Dichloropropene	ND	0.0010									
Dibromochloromethane	ND	0.0050									
Ethylbenzene	ND	0.0050									
Methyl tert-butyl ether	ND	0.0050									
Methylene chloride	ND	0.0050									
Styrene	ND	0.0050									
Tetrachloroethene	ND	0.0050									
Toluene	ND	0.0050									
trans-1,2-Dichloroethene	ND	0.0050									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: R7583

Sample ID: VBLK102111A-3	SampType: MBLK	TestCode: VOC_W+	Units: mg/L	Prep Date:	Run
Client ID: ZZZZZ	Batch ID: R75839	TestNo: SW8260B		Analysis Date: 10/21/2011	Seq

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val
trans-1,3-Dichloropropene	ND	0.0010						
Trichloroethene	ND	0.0050						
Vinyl chloride	ND	0.0020						
Xylenes, Total	ND	0.015						

Sample ID: VLCS102111A-3	SampType: LCS	TestCode: VOC_W+	Units: mg/L	Prep Date:	Run
Client ID: ZZZZZ	Batch ID: R75839	TestNo: SW8260B		Analysis Date: 10/21/2011	Seq

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val
1,1,1-Trichloroethane	0.05531	0.0050	0.05	0	111	70	130	0
1,1,2,2-Tetrachloroethane	0.05714	0.0050	0.05	0	114	70	130	0
1,1,2-Trichloroethane	0.05181	0.0050	0.05	0	104	70	130	0
1,1-Dichloroethane	0.05603	0.0050	0.05	0	112	70	130	0
1,1-Dichloroethene	0.05562	0.0050	0.05	0	111	70	130	0
1,2-Dichloroethane	0.0545	0.0050	0.05	0	109	70	130	0
1,2-Dichloropropane	0.05521	0.0050	0.05	0	110	70	130	0
2-Butanone	0.1297	0.020	0.1	0	130	70	130	0
2-Hexanone	0.1132	0.020	0.1	0	113	70	130	0
4-Methyl-2-pentanone	0.1278	0.020	0.1	0	128	70	130	0
Acetone	0.1144	0.020	0.1	0	114	50	150	0
Benzene	0.05539	0.0050	0.05	0	111	70	130	0
Bromodichloromethane	0.05873	0.0050	0.05	0	117	70	130	0
Bromoform	0.04786	0.0050	0.05	0	95.7	70	130	0
Bromomethane	0.04146	0.010	0.05	0	82.9	70	130	0
Carbon disulfide	0.1181	0.010	0.1	0.00055	118	70	130	0
Carbon tetrachloride	0.05522	0.0050	0.05	0	110	70	130	0
Chlorobenzene	0.05134	0.0050	0.05	0	103	70	130	0
Chloroethane	0.05165	0.010	0.05	0	103	70	130	0
Chloroform	0.05667	0.0050	0.05	0	113	70	130	0
Chloromethane	0.04883	0.010	0.05	0	97.7	70	130	0
cis-1,2-Dichloroethene	0.05823	0.0050	0.05	0	116	70	130	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitati

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: R75839

Sample ID: **VLCS102111A-3** SampType: **LCS** TestCode: **VOC_W+** Units: **mg/L** Prep Date: Run I
Client ID: **ZZZZZ** Batch ID: **R75839** TestNo: **SW8260B** Analysis Date: **10/21/2011** SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
cis-1,3-Dichloropropene	0.05592	0.0010	0.05	0	112	70	130	0	
Dibromochloromethane	0.05414	0.0050	0.05	0	108	70	130	0	
Ethylbenzene	0.05289	0.0050	0.05	0	106	70	130	0	
Methyl tert-butyl ether	0.05477	0.0050	0.05	0	110	50	150	0	
Methylene chloride	0.05609	0.0050	0.05	0	112	70	130	0	
Styrene	0.05615	0.0050	0.05	0	112	70	130	0	
Tetrachloroethene	0.05131	0.0050	0.05	0	103	70	130	0	
Toluene	0.0554	0.0050	0.05	0	111	70	130	0	
trans-1,2-Dichloroethene	0.05763	0.0050	0.05	0	115	70	130	0	
trans-1,3-Dichloropropene	0.05024	0.0010	0.05	0	100	70	130	0	
Trichloroethene	0.05306	0.0050	0.05	0	106	70	130	0	
Vinyl chloride	0.04953	0.0020	0.05	0	99.1	70	130	0	
Xylenes, Total	0.1627	0.015	0.15	0	108	70	130	0	

Sample ID: **VLCSD102111A-3** SampType: **LCSD** TestCode: **VOC_W+** Units: **mg/L** Prep Date: Run I
Client ID: **ZZZZZ** Batch ID: **R75839** TestNo: **SW8260B** Analysis Date: **10/21/2011** SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
1,1,1-Trichloroethane	0.05827	0.0050	0.05	0	117	70	130	0.05531	
1,1,2,2-Tetrachloroethane	0.05866	0.0050	0.05	0	117	70	130	0.05714	
1,1,2-Trichloroethane	0.05489	0.0050	0.05	0	110	70	130	0.05181	
1,1-Dichloroethane	0.05863	0.0050	0.05	0	117	70	130	0.05603	
1,1-Dichloroethene	0.05997	0.0050	0.05	0	120	70	130	0.05562	
1,2-Dichloroethane	0.05648	0.0050	0.05	0	113	70	130	0.0545	
1,2-Dichloropropane	0.05656	0.0050	0.05	0	113	70	130	0.05521	
2-Butanone	0.1338	0.020	0.1	0	134	70	130	0.1297	
2-Hexanone	0.1198	0.020	0.1	0	120	70	130	0.1132	
4-Methyl-2-pentanone	0.13	0.020	0.1	0	130	70	130	0.1278	
Acetone	0.121	0.020	0.1	0	121	50	150	0.1144	
Benzene	0.05743	0.0050	0.05	0	115	70	130	0.05539	
Bromodichloromethane	0.05989	0.0050	0.05	0	120	70	130	0.05873	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitatio

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: R7583

Sample ID: **VLCSD102111A-3** SampType: **LCSD** TestCode: **VOC_W+** Units: **mg/L** Prep Date: Run
Client ID: **ZZZZZ** Batch ID: **R75839** TestNo: **SW8260B** Analysis Date: **10/21/2011** Seq

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Bromoform	0.0499	0.0050	0.05	0	99.8	70	130	0.04786	
Bromomethane	0.04354	0.010	0.05	0	87.1	70	130	0.04146	
Carbon disulfide	0.1254	0.010	0.1	0.00055	125	70	130	0.1181	
Carbon tetrachloride	0.05848	0.0050	0.05	0	117	70	130	0.05522	
Chlorobenzene	0.05421	0.0050	0.05	0	108	70	130	0.05134	
Chloroethane	0.05287	0.010	0.05	0	106	70	130	0.05165	
Chloroform	0.0594	0.0050	0.05	0	119	70	130	0.05667	
Chloromethane	0.05226	0.010	0.05	0	105	70	130	0.04883	
cis-1,2-Dichloroethene	0.05981	0.0050	0.05	0	120	70	130	0.05823	
cis-1,3-Dichloropropene	0.05829	0.0010	0.05	0	117	70	130	0.05592	
Dibromochloromethane	0.05766	0.0050	0.05	0	115	70	130	0.05414	
Ethylbenzene	0.0563	0.0050	0.05	0	113	70	130	0.05289	
Methyl tert-butyl ether	0.05603	0.0050	0.05	0	112	50	150	0.05477	
Methylene chloride	0.05829	0.0050	0.05	0	117	70	130	0.05609	
Styrene	0.05911	0.0050	0.05	0	118	70	130	0.05615	
Tetrachloroethene	0.05511	0.0050	0.05	0	110	70	130	0.05131	
Toluene	0.05837	0.0050	0.05	0	117	70	130	0.0554	
trans-1,2-Dichloroethene	0.06067	0.0050	0.05	0	121	70	130	0.05763	
trans-1,3-Dichloropropene	0.05253	0.0010	0.05	0	105	70	130	0.05024	
Trichloroethene	0.05584	0.0050	0.05	0	112	70	130	0.05306	
Vinyl chloride	0.05346	0.0020	0.05	0	107	70	130	0.04953	
Xylenes, Total	0.1729	0.015	0.15	0	115	70	130	0.1627	

Sample ID: **11100544-003AMS** SampType: **MS** TestCode: **VOC_W+** Units: **mg/L** Prep Date: Run
Client ID: **ZZZZZ** Batch ID: **R75839** TestNo: **SW8260B** Analysis Date: **10/22/2011** Seq

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
1,1,1-Trichloroethane	0.05835	0.0050	0.05	0	117	70	130	0	
1,1,2,2-Tetrachloroethane	0.05683	0.0050	0.05	0	114	70	130	0	
1,1,2-Trichloroethane	0.05345	0.0050	0.05	0	107	70	130	0	
1,1-Dichloroethane	0.0586	0.0050	0.05	0	117	70	130	0	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitati

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: R75839

Sample ID: 11100544-003AMS	SampType: MS	TestCode: VOC_W+	Units: mg/L	Prep Date:	Run I
Client ID: ZZZZZ	Batch ID: R75839	TestNo: SW8260B		Analysis Date: 10/22/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
1,1-Dichloroethene	0.0611	0.0050	0.05	0	122	70	130	0	
1,2-Dichloroethane	0.05712	0.0050	0.05	0	114	70	130	0	
1,2-Dichloropropane	0.05763	0.0050	0.05	0	115	70	130	0	
2-Butanone	0.1286	0.020	0.1	0	129	70	130	0	
2-Hexanone	0.1126	0.020	0.1	0	113	70	130	0	
4-Methyl-2-pentanone	0.1264	0.020	0.1	0	126	70	130	0	
Acetone	0.1176	0.020	0.1	0	118	70	130	0	
Benzene	0.0579	0.0050	0.05	0	116	70	130	0	
Bromodichloromethane	0.06067	0.0050	0.05	0	121	70	130	0	
Bromoform	0.04866	0.0050	0.05	0	97.3	70	130	0	
Bromomethane	0.03389	0.010	0.05	0	67.8	70	130	0	
Carbon disulfide	0.1301	0.010	0.1	0	130	70	130	0	
Carbon tetrachloride	0.05817	0.0050	0.05	0	116	70	130	0	
Chlorobenzene	0.05323	0.0050	0.05	0	106	70	130	0	
Chloroethane	0.05754	0.010	0.05	0	115	70	130	0	
Chloroform	0.06007	0.0050	0.05	0	120	70	130	0	
Chloromethane	0.05361	0.010	0.05	0	107	70	130	0	
cis-1,2-Dichloroethene	0.06201	0.0050	0.05	0	124	70	130	0	
cis-1,3-Dichloropropene	0.05587	0.0010	0.05	0	112	70	130	0	
Dibromochloromethane	0.05763	0.0050	0.05	0	115	70	130	0	
Ethylbenzene	0.05544	0.0050	0.05	0	111	70	130	0	
Methyl tert-butyl ether	0.0633	0.0050	0.05	0	127	50	150	0	
Methylene chloride	0.07315	0.0050	0.05	0	146	70	130	0	
Styrene	0.05757	0.0050	0.05	0	115	70	130	0	
Tetrachloroethene	0.05317	0.0050	0.05	0	106	70	130	0	
Toluene	0.05816	0.0050	0.05	0	116	70	130	0	
trans-1,2-Dichloroethene	0.07403	0.0050	0.05	0	148	70	130	0	
trans-1,3-Dichloropropene	0.05008	0.0010	0.05	0	100	70	130	0	
Trichloroethene	0.05605	0.0050	0.05	0	112	70	130	0	
Vinyl chloride	0.05111	0.0020	0.05	0	102	70	130	0	
Xylenes, Total	0.1694	0.015	0.15	0	113	70	130	0	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitatio

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: R7583

Sample ID: 11100544-003AMSD	SampType: MSD	TestCode: VOC_W+	Units: mg/L	Prep Date:	Run I
Client ID: ZZZZZ	Batch ID: R75839	TestNo: SW8260B		Analysis Date: 10/22/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
1,1,1-Trichloroethane	0.06111	0.0050	0.05	0	122	70	130	0.05835	
1,1,2,2-Tetrachloroethane	0.05767	0.0050	0.05	0	115	70	130	0.05683	
1,1,2-Trichloroethane	0.0534	0.0050	0.05	0	107	70	130	0.05345	0
1,1-Dichloroethane	0.06003	0.0050	0.05	0	120	70	130	0.0586	
1,1-Dichloroethene	0.06254	0.0050	0.05	0	125	70	130	0.0611	
1,2-Dichloroethane	0.05642	0.0050	0.05	0	113	70	130	0.05712	
1,2-Dichloropropane	0.05918	0.0050	0.05	0	118	70	130	0.05763	
2-Butanone	0.1242	0.020	0.1	0	124	70	130	0.1286	
2-Hexanone	0.112	0.020	0.1	0	112	70	130	0.1126	
4-Methyl-2-pentanone	0.1278	0.020	0.1	0	128	70	130	0.1264	
Acetone	0.1177	0.020	0.1	0	118	70	130	0.1176	
Benzene	0.05951	0.0050	0.05	0	119	70	130	0.0579	
Bromodichloromethane	0.06213	0.0050	0.05	0	124	70	130	0.06087	
Bromoform	0.0491	0.0050	0.05	0	98.2	70	130	0.04866	
Bromomethane	0.03605	0.010	0.05	0	72.1	70	130	0.03389	
Carbon disulfide	0.1405	0.010	0.1	0	140	70	130	0.1301	
Carbon tetrachloride	0.05993	0.0050	0.05	0	120	70	130	0.05817	
Chlorobenzene	0.05445	0.0050	0.05	0	109	70	130	0.05323	
Chloroethane	0.05836	0.010	0.05	0	117	70	130	0.05754	
Chloroform	0.06129	0.0050	0.05	0	123	70	130	0.06007	
Chloromethane	0.05459	0.010	0.05	0	109	70	130	0.05361	
cis-1,2-Dichloroethene	0.06299	0.0050	0.05	0	126	70	130	0.06201	
cis-1,3-Dichloropropene	0.05805	0.0010	0.05	0	116	70	130	0.05587	
Dibromochloromethane	0.05761	0.0050	0.05	0	115	70	130	0.05763	0
Ethylbenzene	0.05701	0.0050	0.05	0	114	70	130	0.05544	
Methyl tert-butyl ether	0.06476	0.0050	0.05	0	130	50	150	0.0633	
Methylene chloride	0.074	0.0050	0.05	0	148	70	130	0.07315	
Styrene	0.05905	0.0050	0.05	0	118	70	130	0.05757	
Tetrachloroethene	0.05529	0.0050	0.05	0	111	70	130	0.05317	
Toluene	0.0598	0.0050	0.05	0	120	70	130	0.05816	
trans-1,2-Dichloroethene	0.07552	0.0050	0.05	0	151	70	130	0.07403	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitatio

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: R75839

Sample ID:	11100544-003AMSD	SampType:	MSD	TestCode:	VOC_W+	Units:	mg/L	Prep Date:			Run I
Client ID:	ZZZZZ	Batch ID:	R75839	TestNo:	SW8260B			Analysis Date:	10/22/2011		SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
trans-1,3-Dichloropropene	0.0516	0.0010	0.05	0	103	70	130	0.05008	
Trichloroethene	0.05669	0.0050	0.05	0	113	70	130	0.05605	
Vinyl chloride	0.05333	0.0020	0.05	0	107	70	130	0.05111	
Xylenes, Total	0.1742	0.015	0.15	0	116	70	130	0.1694	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitatio

STAT Analysis Corporation

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site
Test No: SW8270C **Matrix:** W

QC SUMMARY REPORT
SURROGATE RECOVERIES

Sample ID	CLPH2D4	DCBZ12D4	NO2BZD5	PH246BR	PH2F	PHD5	PHEN2F	PHEND14
lcs-59338-svoc	91.2	88.8	97.1	114	70.3	49.9	97.1	132
MB-59338-SVOC	90.5	103	83.6	120	78.4	44.0	105	138
11100535-001B	58.4	71.0	53.6	92.2	48.1	30.4	64.1	39.1
11100544-003BMS	82.5	69.6	74.6	120	60.3	38.3	79.2	134
11100544-003BMSD	69.4	52.4	63.9	123 *	4.90 *	36.4	80.1	124

Acronym		Surrogate	QC Limits
CLPH2D4	=	2-Chlorophenol-d4	33-110
DCBZ12D4	=	1,2-Dichlorobenzene-d4	16-110
NO2BZD5	=	Nitrobenzene-d5	35-114
PH246BR	=	2,4,6-Tribromophenol	10-123
PH2F	=	2-Fluorophenol	21-110
PHD5	=	Phenol-d5	10-110
PHEN2F	=	2-Fluorobiphenyl	43-116
PHEND14	=	4-Terphenyl-d14	33-141

*** Surrogate recovery outside acceptance limit**

STAT Analysis Corporation

PREP BATCH

Prep Start Date: **10/21/2011 11:13:47**
Prep End Date:

Prep Factor Units: **mL / L**

Prep Batch **59338** Prep Code: **3510_SVOC** Technician: **PEM**

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart
MB-59338-SVOC			1	0	0	1	1.000	10/21/2011
LCS-59338-SVOC			1	0	0	1	1.000	10/21/2011
11100527-001B	Water		1	0	0	1	1.000	10/21/2011
11100528-001A	Soil		0.5	0	0	1	2.000	10/21/2011
11100535-001B	Water		1	0	0	1	1.000	10/21/2011
11100544-001B	Water		1	0	0	1	1.000	10/21/2011
11100544-002B	Water		1	0	0	1	1.000	10/21/2011
11100544-003B	Water		1	0	0	1	1.000	10/21/2011
11100544-003BMS	Water		1	0	0	1	1.000	10/21/2011
11100544-003BMSD	Water		1	0	0	1	1.000	10/21/2011
11100544-004B	Water		1	0	0	1	1.000	10/21/2011
11100544-005B	Water		1	0	0	1	1.000	10/21/2011
11100544-006B	Water		1	0	0	1	1.000	10/21/2011
MB-59338-TCLP			0.5	0	0	1	2.000	10/21/2011

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59338

Sample ID: MB-59338-SVOC | SampType: MBLK | TestCode: SVOC_WATE | Units: mg/L | Prep Date: 10/21/2011 | Run ID: SVOC-6_111024A
Client ID: ZZZZZ | Batch ID: 59338 | TestNo: SW8270C | Analysis Date: 10/24/2011 | SeqNo: 2036012

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aniline	ND	0.025									
Benzidine	ND	0.025									
Benzoic acid	ND	0.025									
Benzyl alcohol	ND	0.0050									
Bis(2-chloroethoxy)methane	ND	0.0050									
Bis(2-chloroethyl)ether	ND	0.0050									
Bis(2-ethylhexyl)phthalate	ND	0.0060									
4-Bromophenyl phenyl ether	ND	0.0050									
Butyl benzyl phthalate	ND	0.0050									
4-Chloroaniline	ND	0.0050									
4-Chloro-3-methylphenol	ND	0.0050									
2-Chloronaphthalene	ND	0.0050									
2-Chlorophenol	ND	0.0050									
4-Chlorophenyl phenyl ether	ND	0.0050									
Dibenzofuran	ND	0.0050									
1,2-Dichlorobenzene	ND	0.0050									
1,3-Dichlorobenzene	ND	0.0050									
1,4-Dichlorobenzene	ND	0.0050									
3,3'-Dichlorobenzidine	ND	0.010									
2,4-Dichlorophenol	ND	0.0050									
Diethyl phthalate	ND	0.0050									
2,4-Dimethylphenol	ND	0.0050									
Dimethyl phthalate	ND	0.0050									
4,6-Dinitro-2-methylphenol	ND	0.025									
2,4-Dinitrophenol	ND	0.025									
Di-n-butyl phthalate	ND	0.0050									
Di-n-octyl phthalate	ND	0.0050									
Hexachlorobenzene	ND	0.0050									
Hexachlorobutadiene	ND	0.0050									
Hexachlorocyclopentadiene	ND	0.0050									
Hexachloroethane	ND	0.0050									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59338

Sample ID: MB-59338-SVOC | SampType: MBLK | TestCode: SVOC_WATE | Units: mg/L | Prep Date: 10/21/2011 | Run ID: SVOC-6_111024A
Client ID: ZZZZZ | Batch ID: 59338 | TestNo: SW8270C | Analysis Date: 10/24/2011 | SeqNo: 2036012

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Isophorone	ND	0.0050									
2-Methylnaphthalene	0.00099	0.0050									J
2-Methylphenol	ND	0.0050									
4-Methylphenol	ND	0.0050									
2-Nitroaniline	ND	0.0050									
3-Nitroaniline	ND	0.025									
4-Nitroaniline	ND	0.025									
2-Nitrophenol	ND	0.0050									
4-Nitrophenol	ND	0.025									
N-Nitrosodimethylamine	ND	0.0050									
N-Nitrosodiphenylamine	ND	0.0050									
2, 2'-oxybis(1-Chloropropane)	ND	0.0050									
Phenol	ND	0.0050									
Pyridine	ND	0.0050									
1,2,4-Trichlorobenzene	ND	0.0050									
2,4,5-Trichlorophenol	ND	0.010									
2,4,6-Trichlorophenol	ND	0.0050									

Sample ID: lcs-59338-svoc | SampType: lcs | TestCode: SVOC_water | Units: mg/L | Prep Date: 10/21/2011 | Run ID: SVOC-6_111021A
Client ID: ZZZZZ | Batch ID: 59338 | TestNo: SW8270C | Analysis Date: 10/21/2011 | SeqNo: 2035542

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	0.04727	0.0050	0.05	0	94.5	54	116	0	0		
4-Chloro-3-methylphenol	0.09581	0.0050	0.1	0	95.8	49	117	0	0		
2-Chlorophenol	0.08807	0.0050	0.1	0	88.1	44	103	0	0		
1,4-Dichlorobenzene	0.04375	0.0050	0.05	0	87.5	41	90	0	0		
2,4-Dinitrotoluene	0.04185	0.0050	0.05	0	83.7	46	122	0	0		
4-Nitrophenol	0.04844	0.025	0.1	0	48.4	15	78	0	0		
N-Nitrosodi-n-propylamine	0.03963	0.0050	0.05	0	79.3	43	108	0	0		
Pentachlorophenol	0.09453	0.025	0.1	0	94.5	10	221	0	0		
Phenol	0.04649	0.0050	0.1	0	46.5	23	58	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59338

Sample ID: lcs-59338-svoc SampType: lcs TestCode: SVOC_water Units: mg/L Prep Date: 10/21/2011 Run ID: SVOC-6_111021A
Client ID: ZZZZZ Batch ID: 59338 TestNo: SW8270C Analysis Date: 10/21/2011 SeqNo: 2035542

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pyrene	0.05086	0.0050	0.05	0	102	53	140	0	0		
1,2,4-Trichlorobenzene	0.04178	0.0050	0.05	0	83.6	42	96	0	0		

Sample ID: 11100544-003BMS SampType: MS TestCode: SVOC_WATE Units: mg/L Prep Date: 10/21/2011 Run ID: SVOC-6_111024A
Client ID: ZZZZZ Batch ID: 59338 TestNo: SW8270C Analysis Date: 10/24/2011 SeqNo: 2036243

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	0.0454	0.0050	0.05	0	90.8	62	97	0	0		
4-Chloro-3-methylphenol	0.08329	0.0050	0.1	0	83.3	64	104	0	0		
2-Chlorophenol	0.08178	0.0050	0.1	0	81.8	41	95	0	0		
1,4-Dichlorobenzene	0.03175	0.0050	0.05	0	63.5	44	85	0	0		
2,4-Dinitrotoluene	0.04526	0.0050	0.05	0	90.5	66	106	0	0		
4-Nitrophenol	0.02899	0.025	0.1	0	29	22	77	0	0		
N-Nitrosodi-n-propylamine	0.03434	0.0050	0.05	0	68.7	47	93	0	0		
Pentachlorophenol	0.08657	0.025	0.1	0	86.6	50	151	0	0		
Phenol	0.04194	0.0050	0.1	0	41.9	27	52	0	0		
Pyrene	0.05234	0.0050	0.05	0	105	67	104	0	0		S
1,2,4-Trichlorobenzene	0.03641	0.0050	0.05	0	72.8	48	90	0	0		

Sample ID: 11100544-003BMSD SampType: MSD TestCode: SVOC_WATE Units: mg/L Prep Date: 10/21/2011 Run ID: SVOC-6_111024A
Client ID: ZZZZZ Batch ID: 59338 TestNo: SW8270C Analysis Date: 10/24/2011 SeqNo: 2036244

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	0.04722	0.0050	0.05	0	94.4	62	97	0.0454	3.93	18	
4-Chloro-3-methylphenol	0.07712	0.0050	0.1	0	77.1	64	104	0.08329	7.69	22	
2-Chlorophenol	0.07401	0.0050	0.1	0	74	41	95	0.08178	9.97	37	
1,4-Dichlorobenzene	0.02477	0.0050	0.05	0	49.5	44	85	0.03175	24.7	24	R
2,4-Dinitrotoluene	0.04951	0.0050	0.05	0	99	66	106	0.04526	8.97	21	
4-Nitrophenol	0.03278	0.025	0.1	0	32.8	22	77	0.02899	12.3	31	
N-Nitrosodi-n-propylamine	0.03161	0.0050	0.05	0	63.2	47	93	0.03434	8.28	29	
Pentachlorophenol	0.08801	0.025	0.1	0	88	50	151	0.08657	1.65	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59338

Sample ID: **11100544-003BMSD** SampType: **MSD** TestCode: **SVOC_WATE** Units: **mg/L** Prep Date: **10/21/2011** Run ID: **SVOC-6_111024A**
Client ID: **ZZZZZ** Batch ID: **59338** TestNo: **SW8270C** Analysis Date: **10/24/2011** SeqNo: **2036244**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	0.03633	0.0050	0.1	0	36.3	27	52	0.04194	14.3	33	
Pyrene	0.04882	0.0050	0.05	0	97.6	67	104	0.05234	6.96	19	
1,2,4-Trichlorobenzene	0.03461	0.0050	0.05	0	69.2	48	90	0.03641	5.07	25	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

STAT Analysis Corporation

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site
Test No: SW8270C-SIM **Matrix:** W

QC SUMMARY REPORT
SURROGATE RECOVERIES

Sample ID	DCBZ12D4	NO2BZD5	PHEN2F	PHEND14				
11100544-003BMS	52.0	96.2	63.0	94.2				
11100544-003BMSD	55.2	93.6	60.4	84.8				
LCS-59337-PNA	81.2	124 *	84.0	106				
MB-59337-PNA	75.6	113	85.2	119				
11100535-001B	52.9	87.5	37.5 *	24.1 *				

Acronym		Surrogate	QC Limits
DCBZ12D4	=	1,2-Dichlorobenzene-d4	16-110
NO2BZD5	=	Nitrobenzene-d5	35-114
PHEN2F	=	2-Fluorobiphenyl	43-116
PHEND14	=	4-Terphenyl-d14	33-141

*** Surrogate recovery outside acceptance limit**

STAT Analysis Corporation

PREP BATCH REPORT

Prep Start Date: **10/21/2011 11:12:33**
Prep End Date:

Prep Batch **59337** Prep Code: **3510_PNA** Technician: **PEM**

Prep Factor Units: **mL / L**

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-59337-PNA			1	0	0	1	1.000	10/21/2011	10/21/2011
LCS-59337-PNA			1	0	0	1	1.000	10/21/2011	10/21/2011
11100527-001B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100535-001B	Water		0.1	0	0	1	10.000	10/21/2011	10/21/2011
11100543-001B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100543-002B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-001B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-002B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-003B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-003BMS	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-003BMSD	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-004B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-005B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011
11100544-006B	Water		1	0	0	1	1.000	10/21/2011	10/21/2011

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59337

Sample ID: MB-59337-PNA | SampType: MBLK | TestCode: PNA_WATER | Units: mg/L | Prep Date: 10/21/2011 | Run ID: SVOC-3_111023A
Client ID: ZZZZZ | Batch ID: 59337 | TestNo: SW8270C-SI | Analysis Date: 10/24/2011 | SeqNo: 2035794

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	0.00010									
2,6-Dinitrotoluene	ND	0.00010									
Acenaphthene	ND	0.0010									
Acenaphthylene	ND	0.0010									
Anthracene	ND	0.0010									
Benz(a)anthracene	ND	0.00010									
Benzo(a)pyrene	ND	0.00010									
Benzo(b)fluoranthene	ND	0.00010									
Benzo(g,h,i)perylene	ND	0.0010									
Benzo(k)fluoranthene	ND	0.00010									
Carbazole	ND	0.00010									
Chrysene	ND	0.00010									
Dibenz(a,h)anthracene	ND	0.00010									
Fluoranthene	ND	0.0010									
Fluorene	ND	0.0010									
Indeno(1,2,3-cd)pyrene	ND	0.00010									
N-Nitrosodi-n-propylamine	ND	0.00010									
Naphthalene	0.00019	0.0010									J
Nitrobenzene	ND	0.0010									
Pentachlorophenol	ND	0.00050									
Phenanthrene	ND	0.0010									
Pyrene	ND	0.0010									

Sample ID: LCS-59337-PNA | SampType: LCS | TestCode: PNA_WATER | Units: mg/L | Prep Date: 10/21/2011 | Run ID: SVOC-3_111023A
Client ID: ZZZZZ | Batch ID: 59337 | TestNo: SW8270C-SI | Analysis Date: 10/24/2011 | SeqNo: 2035793

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	0.03859	0.00010	0.005	0	772	50	125	0	0		SE
2,6-Dinitrotoluene	0.00683	0.00010	0.005	0	137	50	125	0	0		S
Acenaphthene	0.00599	0.0010	0.005	0	120	50	125	0	0		
Acenaphthylene	0.00542	0.0010	0.005	0	108	50	125	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59337

Sample ID: LCS-59337-PNA | SampType: LCS | TestCode: PNA_WATER | Units: mg/L | Prep Date: 10/21/2011 | Run ID: SVOC-3_111023A
Client ID: ZZZZZ | Batch ID: 59337 | TestNo: SW8270C-SI | Analysis Date: 10/24/2011 | SeqNo: 2035793

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Anthracene	0.00638	0.0010	0.005	0	128	50	125	0	0		S
Benz(a)anthracene	0.00623	0.00010	0.005	0	125	50	125	0	0		
Benzo(a)pyrene	0.00675	0.00010	0.005	0	135	50	125	0	0		S
Benzo(b)fluoranthene	0.00682	0.00010	0.005	0	136	50	125	0	0		S
Benzo(g,h,i)perylene	0.00399	0.0010	0.005	0	79.8	50	125	0	0		
Benzo(k)fluoranthene	0.00762	0.00010	0.005	0	152	50	125	0	0		S
Carbazole	0.00651	0.00010	0.005	0	130	50	125	0	0		S
Chrysene	0.00565	0.00010	0.005	0	113	50	125	0	0		
Dibenz(a,h)anthracene	0.00525	0.00010	0.005	0	105	50	125	0	0		
Fluoranthene	0.00606	0.0010	0.005	0	121	50	125	0	0		
Fluorene	0.00591	0.0010	0.005	0	118	50	125	0	0		
Indeno(1,2,3-cd)pyrene	0.00474	0.00010	0.005	0	94.8	50	125	0	0		
N-Nitrosodi-n-propylamine	0.00747	0.00010	0.005	0	149	50	125	0	0		S
Naphthalene	0.0055	0.0010	0.005	0.00019	106	50	125	0	0		
Nitrobenzene	0.00678	0.0010	0.005	0	136	50	125	0	0		S
Pentachlorophenol	0.01266	0.00050	0.005	0	253	50	125	0	0		SE
Phenanthrene	0.0055	0.0010	0.005	0	110	50	125	0	0		
Pyrene	0.00597	0.0010	0.005	0	119	50	125	0	0		

Sample ID: 11100544-003BMS | SampType: MS | TestCode: PNA_WATER | Units: mg/L | Prep Date: 10/21/2011 | Run ID: SVOC-3_111023A
Client ID: ZZZZZ | Batch ID: 59337 | TestNo: SW8270C-SI | Analysis Date: 10/24/2011 | SeqNo: 2035791

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	0.00884	0.00010	0.005	0	177	50	125	0	0		S
2,6-Dinitrotoluene	0.00645	0.00010	0.005	0	129	50	125	0	0		S
Acenaphthene	0.00527	0.0010	0.005	0.00015	102	50	125	0	0		
Acenaphthylene	0.00431	0.0010	0.005	0	86.2	50	125	0	0		
Anthracene	0.0057	0.0010	0.005	0	114	50	125	0	0		
Benz(a)anthracene	0.00584	0.00010	0.005	0	117	50	125	0	0		
Benzo(a)pyrene	0.00632	0.00010	0.005	0	126	50	125	0	0		S
Benzo(b)fluoranthene	0.00492	0.00010	0.005	0	98.4	50	125	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59337

Sample ID: 11100544-003BMS SampType: MS TestCode: PNA_WATER Units: mg/L Prep Date: 10/21/2011 Run ID: SVOC-3_111023A
Client ID: ZZZZZ Batch ID: 59337 TestNo: SW8270C-SI Analysis Date: 10/24/2011 SeqNo: 2035791

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(g,h,i)perylene	0.00391	0.0010	0.005	0	78.2	50	125	0	0		
Benzo(k)fluoranthene	0.00571	0.00010	0.005	0	114	50	125	0	0		
Carbazole	0.00593	0.00010	0.005	0	119	50	125	0	0		
Chrysene	0.00505	0.00010	0.005	0	101	50	125	0	0		
Dibenz(a,h)anthracene	0.00502	0.00010	0.005	0	100	50	125	0	0		
Fluoranthene	0.00529	0.0010	0.005	0	106	50	125	0	0		
Fluorene	0.00533	0.0010	0.005	0	107	50	125	0	0		
Indeno(1,2,3-cd)pyrene	0.00448	0.00010	0.005	0	89.6	50	125	0	0		
N-Nitrosodi-n-propylamine	0.00597	0.00010	0.005	0	119	50	125	0	0		
Naphthalene	0.00438	0.0010	0.005	0.00025	82.6	50	125	0	0		
Nitrobenzene	0.00542	0.0010	0.005	0	108	50	125	0	0		
Pentachlorophenol	0.00751	0.00050	0.005	0	150	50	125	0	0		S
Phenanthrene	0.00501	0.0010	0.005	0.00015	97.2	50	125	0	0		
Pyrene	0.00523	0.0010	0.005	0	105	50	125	0	0		

Sample ID: 11100544-003BMSD SampType: MSD TestCode: PNA_WATER Units: mg/L Prep Date: 10/21/2011 Run ID: SVOC-3_111023A
Client ID: ZZZZZ Batch ID: 59337 TestNo: SW8270C-SI Analysis Date: 10/24/2011 SeqNo: 2035792

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	0.00513	0.0010	0.005	0	103	50	125	0.00527	2.69	25	
Acenaphthylene	0.00361	0.0010	0.005	0	72.2	50	125	0.00431	17.7	25	
Anthracene	0.00513	0.0010	0.005	0	103	50	125	0.0057	10.5	25	
Benz(a)anthracene	0.00512	0.00010	0.005	0	102	50	125	0.00584	13.1	25	
Benzo(a)pyrene	0.00562	0.00010	0.005	0	112	50	125	0.00632	11.7	25	
Benzo(b)fluoranthene	0.0054	0.00010	0.005	0	108	50	125	0.00492	9.30	25	
Benzo(g,h,i)perylene	0.00354	0.0010	0.005	0	70.8	50	125	0.00391	9.93	25	
Benzo(k)fluoranthene	0.00304	0.00010	0.005	0	60.8	50	125	0.00571	61.0	25	R
Chrysene	0.00465	0.00010	0.005	0	93	50	125	0.00505	8.25	25	
Dibenz(a,h)anthracene	0.00461	0.00010	0.005	0	92.2	50	125	0.00502	8.52	25	
Fluoranthene	0.00477	0.0010	0.005	0	95.4	50	125	0.00529	10.3	25	
Fluorene	0.00498	0.0010	0.005	0	99.6	50	125	0.00533	6.79	25	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range.

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59337

Sample ID: **11100544-003BMSD** SampType: **MSD** TestCode: **PNA_WATER** Units: **mg/L** Prep Date: **10/21/2011** Run ID: **SVOC-3_111023A**
Client ID: **ZZZZZ** Batch ID: **59337** TestNo: **SW8270C-SI** Analysis Date: **10/24/2011** SeqNo: **2035792**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	0.00413	0.00010	0.005	0	82.6	50	125	0.00448	8.13	25	
Naphthalene	0.00422	0.0010	0.005	0	84.4	50	125	0.00438	3.72	25	
Phenanthrene	0.00449	0.0010	0.005	0	89.8	50	125	0.00501	10.9	25	
Pyrene	0.0047	0.0010	0.005	0	94	50	125	0.00523	10.7	25	
Carbazole	0.00557	0.00010	0.005	0	111	50	125	0.00593	6.26	25	
2,4-Dinitrotoluene	0.00822	0.00010	0.005	0	164	50	125	0.00884	7.27	25	S
2,6-Dinitrotoluene	0.00473	0.00010	0.005	0	94.6	50	125	0.00645	30.8	25	R
N-Nitrosodi-n-propylamine	0.00586	0.00010	0.005	0	117	50	125	0.00597	1.86	25	
Nitrobenzene	0.00524	0.0010	0.005	0	105	50	125	0.00542	3.38	25	
Pentachlorophenol	0.00664	0.00050	0.005	0	133	50	125	0.00751	12.3	25	S

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

STAT Analysis Corporation

PREP BATCH REPORT

Prep Start Date: 10/20/2011 12:00:00
Prep End Date: 10/20/2011 1:50:00

Prep Batch 59304 Prep Code: M_W_PREP Technician: DMR

Prep Factor Units: mL / mL

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
IMBW1 10/20/11			50	0	0	50	1.000	10/20/2011	10/20/2011
ILCSW1 10/20/11			50	0	0	50	1.000	10/20/2011	10/20/2011
IMBTA1 10/19/11			50	0	0	50	1.000	10/20/2011	10/20/2011
11100379-001B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100379-002B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100379-003B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100379-004B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100379-005B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100379-006B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100535-001B	Water		50	0	0	50	1.000	10/20/2011	10/20/2011
11100536-002A	Water		50	0	0	50	1.000	10/20/2011	10/20/2011
11100537-001A	Solid		50	0	0	50	1.000	10/20/2011	10/20/2011
11100537-003A	Solid		50	0	0	50	1.000	10/20/2011	10/20/2011
11100580-001B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100580-002B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100580-003B	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100585-001A	Sludge		50	0	0	50	1.000	10/20/2011	10/20/2011
11100585-002A	Sludge		50	0	0	50	1.000	10/20/2011	10/20/2011
11100586-001A	Water		50	0	0	50	1.000	10/20/2011	10/20/2011
11100586-002A	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100587-002A	Sludge		50	0	0	50	1.000	10/20/2011	10/20/2011
11100588-002A	Sludge		50	0	0	50	1.000	10/20/2011	10/20/2011
11100588-003A	Sludge		50	0	0	50	1.000	10/20/2011	10/20/2011
11100580-003BMS	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011
11100580-003BMSD	Soil		50	0	0	50	1.000	10/20/2011	10/20/2011

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59304

Sample ID: IMBTA1 10/19/11 SampType: MBLK TestCode: M_ICPMS_T+ Units: mg/L Prep Date: 10/20/2011 Run ID: ICPMS_111020A
Client ID: ZZZZZ Batch ID: 59304 TestNo: SW1311/6020 Analysis Date: 10/20/2011 SeqNo: 2033683

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.010									
Barium	0.00285	0.50									J
Cadmium	ND	0.0050									
Chromium	ND	0.010									
Lead	ND	0.0050									
Selenium	ND	0.010									
Silver	0.0028	0.010									J

Sample ID: 11100580-003BMS SampType: MS TestCode: M_ICPMS_T+ Units: mg/L Prep Date: 10/20/2011 Run ID: ICPMS_111020A
Client ID: ZZZZZ Batch ID: 59304 TestNo: SW1311/6020 Analysis Date: 10/20/2011 SeqNo: 2033688

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.4859	0.010	0.5	0	97.2	75	125	0	0		
Barium	0.6213	0.50	0.5	0.1186	101	75	125	0	0		
Cadmium	0.4391	0.0050	0.5	0	87.8	75	125	0	0		
Chromium	0.4903	0.010	0.5	0	98.1	75	125	0	0		
Lead	0.5242	0.0050	0.5	0	105	75	125	0	0		
Selenium	0.4224	0.010	0.5	0	84.5	75	125	0	0		
Silver	0.1799	0.010	0.2	0.00268	88.6	75	125	0	0		

Sample ID: 11100580-003BMSD SampType: MSD TestCode: M_ICPMS_T+ Units: mg/L Prep Date: 10/20/2011 Run ID: ICPMS_111020A
Client ID: ZZZZZ Batch ID: 59304 TestNo: SW1311/6020 Analysis Date: 10/20/2011 SeqNo: 2033689

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.4811	0.010	0.5	0	96.2	75	125	0.4859	0.993	20	
Barium	0.6387	0.50	0.5	0.1186	104	75	125	0.6213	2.76	20	
Cadmium	0.4532	0.0050	0.5	0	90.6	75	125	0.4391	3.16	20	
Chromium	0.4986	0.010	0.5	0	99.7	75	125	0.4903	1.68	20	
Lead	0.533	0.0050	0.5	0	107	75	125	0.5242	1.66	20	
Selenium	0.4255	0.010	0.5	0	85.1	75	125	0.4224	0.731	20	
Silver	0.1835	0.010	0.2	0.00268	90.4	75	125	0.1799	1.98	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank.
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59304

Sample ID: IMBW1 10/20/11 | SampType: MBLK | TestCode: M_ICPMS_W | Units: mg/L | Prep Date: 10/20/2011 | Run ID: ICPMS_111020A
Client ID: ZZZZZ | Batch ID: 59304 | TestNo: SW6020 | Analysis Date: 10/20/2011 | SeqNo: 2033684

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.0040									
Barium	ND	0.0040									
Cadmium	ND	0.0020									
Chromium	ND	0.0040									
Lead	ND	0.0020									
Ruthenium	ND	0.0020									
Selenium	ND	0.0040									
Silver	0.00113	0.0040									J
Tungsten	ND	0.010									

Sample ID: ILCSW1 10/20/11 | SampType: LCS | TestCode: M_ICPMS_W | Units: mg/L | Prep Date: 10/20/2011 | Run ID: ICPMS_111020A
Client ID: ZZZZZ | Batch ID: 59304 | TestNo: SW6020 | Analysis Date: 10/20/2011 | SeqNo: 2033685

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.5001	0.0040	0.5	0	100	80	120	0	0		
Barium	0.5005	0.0040	0.5	0	100	80	120	0	0		
Cadmium	0.4908	0.0020	0.5	0	98.2	80	120	0	0		
Chromium	0.4968	0.0040	0.5	0	99.4	80	120	0	0		
Lead	0.4997	0.0020	0.5	0	99.9	80	120	0	0		
Ruthenium	ND	0.0020	0.5	0	0	80	120	0	0		S*
Selenium	0.49	0.0040	0.5	0	98	80	120	0	0		
Silver	0.198	0.0040	0.2	0.00113	98.4	80	120	0	0		
Tungsten	ND	0.010	0.5	0	0	80	120	0	0		S*

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

STAT Analysis Corporation

PREP BATCH REPORT

Prep Start Date: **10/20/2011 1:10:00**
Prep End Date:

Prep Batch **59281** Prep Code: **M_HG_W_PRE** Technician: **LB**

Prep Factor Units: **mL / mL**

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
HGMBW1 10/19/11			30	0	0	30	1.000	10/19/2011	10/19/2011
HGLCSW1 10/19/11			30	0	0	30	1.000	10/19/2011	10/19/2011
11100526-001B	Soil		30	0	0	30	1.000	10/19/2011	10/19/2011
11100526-002B	Soil		30	0	0	30	1.000	10/19/2011	10/19/2011
11100526-003B	Soil		30	0	0	30	1.000	10/19/2011	10/19/2011
11100526-004B	Soil		30	0	0	30	1.000	10/19/2011	10/19/2011
11100526-001BMS	Soil		30	0	0	30	1.000	10/19/2011	10/19/2011
11100526-001BMSD	Soil		30	0	0	30	1.000	10/19/2011	10/19/2011
HGMBTA1 10/19/11			30	0	0	30	1.000	10/20/2011	10/20/2011
11100379-001B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100379-002B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100379-003B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100379-004B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100379-005B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100379-006B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100535-001B	Water		30	0	0	30	1.000	10/20/2011	10/20/2011
11100580-001B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100580-002B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100580-003B	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011
11100580-002BMS	Soil		30	0	0	30	1.000	10/20/2011	10/20/2011

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59281

Sample ID: HGMBTA1 10/19/11	SampType: MBLK	TestCode: M_1311_HG	Units: mg/L	Prep Date: 10/20/2011	Run ID: CETAC_111020C
Client ID: ZZZZZ	Batch ID: 59281	TestNo: SW1311/7470		Analysis Date: 10/20/2011	SeqNo: 2033813

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.00020									

Sample ID: 11100526-001BMS	SampType: MS	TestCode: M_1311_HG	Units: mg/L	Prep Date: 10/19/2011	Run ID: CETAC_111019C
Client ID: ZZZZZ	Batch ID: 59281	TestNo: SW1311/7470		Analysis Date: 10/19/2011	SeqNo: 2032476

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.0027	0.00020	0.0025	0	108	75	125	0	0		

Sample ID: 11100580-002BMS	SampType: MS	TestCode: M_1311_HG	Units: mg/L	Prep Date: 10/20/2011	Run ID: CETAC_111020C
Client ID: ZZZZZ	Batch ID: 59281	TestNo: SW1311/7470		Analysis Date: 10/20/2011	SeqNo: 2033822

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.0029	0.00020	0.0025	0	116	75	125	0	0		

Sample ID: 11100526-001BMSD	SampType: MSD	TestCode: M_1311_HG	Units: mg/L	Prep Date: 10/19/2011	Run ID: CETAC_111019C
Client ID: ZZZZZ	Batch ID: 59281	TestNo: SW1311/7470		Analysis Date: 10/19/2011	SeqNo: 2032477

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00285	0.00020	0.0025	0	114	75	125	0.0027	5.41	20	

Sample ID: HGMBW1 10/19/11	SampType: MBLK	TestCode: M_HG_WATE	Units: mg/L	Prep Date: 10/19/2011	Run ID: CETAC_111019C
Client ID: ZZZZZ	Batch ID: 59281	TestNo: SW7470A		Analysis Date: 10/19/2011	SeqNo: 2032473

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.00020									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMMARY REPORT

BatchID: 59281

Sample ID: **HGLCSW1 10/19/11** SampType: **LCS** TestCode: **M_HG_WATE** Units: **mg/L** Prep Date: **10/19/2011** Run ID: **CETAC_111019C**
Client ID: **ZZZZZ** Batch ID: **59281** TestNo: **SW7470A** Analysis Date: **10/19/2011** SeqNo: **2032474**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00232	0.00020	0.0025	0	92.8	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

STAT Analysis Corporation

PREP BATCH

Prep Start Date: **10/19/2011 10:00:00**
Prep End Date: **10/19/2011 11:45:00**

Prep Batch **59279** Prep Code: **TCNPREP_W** Technician: **YZ**

Prep Factor Units: **mL / mL**

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart
TCNMBW1 101911			50	0	0	50	1.000	10/19/2011
TCNLCSW1 101911			50	0	0	50	1.000	10/19/2011
11100518-001D	Water		50	0	0	50	1.000	10/19/2011
11100527-001D	Water		50	0	0	50	1.000	10/19/2011
11100535-001D	Water		25	0	0	50	2.000	10/19/2011
11100544-001D	Water		50	0	0	50	1.000	10/19/2011
11100544-002D	Water		50	0	0	50	1.000	10/19/2011
11100544-003D	Water		50	0	0	50	1.000	10/19/2011
11100544-003DMS	Water		50	0	0	50	1.000	10/19/2011
11100544-003DMSD	Water		50	0	0	50	1.000	10/19/2011
11100544-004D	Water		50	0	0	50	1.000	10/19/2011
11100544-005D	Water		50	0	0	50	1.000	10/19/2011
11100544-006D	Water		50	0	0	50	1.000	10/19/2011

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: 59279

Sample ID: TCNMBW1 101911	SampType: MBLK	TestCode: CN_TW	Units: mg/L	Prep Date: 10/19/2011	Run I
Client ID: ZZZZZ	Batch ID: 59279	TestNo: SW9012A		Analysis Date: 10/19/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Cyanide	ND	0.0050							

Sample ID: TCNLCSW1 101911	SampType: LCS	TestCode: CN_TW	Units: mg/L	Prep Date: 10/19/2011	Run I
Client ID: ZZZZZ	Batch ID: 59279	TestNo: SW9012A		Analysis Date: 10/19/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Cyanide	0.208	0.0050	0.2	0	104	90	110	0	

Sample ID: 11100544-003DMS	SampType: MS	TestCode: CN_TW	Units: mg/L	Prep Date: 10/19/2011	Run I
Client ID: ZZZZZ	Batch ID: 59279	TestNo: SW9012A		Analysis Date: 10/19/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Cyanide	0.1862	0.0050	0.2	0.005126	90.6	75	125	0	

Sample ID: 11100544-003DMSD	SampType: MSD	TestCode: CN_TW	Units: mg/L	Prep Date: 10/19/2011	Run I
Client ID: ZZZZZ	Batch ID: 59279	TestNo: SW9012A		Analysis Date: 10/19/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Cyanide	0.2187	0.0050	0.2	0.005126	107	75	125	0.1862	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitatio

STAT Analysis Corporation

PREP BATCH

Prep Start Date: **10/20/2011 2:00:00**
Prep End Date:

Prep Factor Units: **mL / mL**

Prep Batch **59311** Prep Code: **PHENOLPR_W** Technician: **YZ**

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart
PHMBW1 102011			50	0	0	50	1.000	10/20/2011
PHLCSW1 102011			50	0	0	50	1.000	10/20/2011
11100535-001E	Water		25	0	0	50	2.000	10/20/2011
11100535-001EMS	Water		25	0	0	50	2.000	10/20/2011
11100535-001EMSD	Water		25	0	0	50	2.000	10/20/2011
11100629-001C	Water		50	0	0	50	1.000	10/20/2011

CLIENT: Burns & McDonnell
Work Order: 11100535
Project: 57618, Black Brother Company Site

ANALYTICAL QC SUMM

BatchID: 59311

Sample ID: PHMBW1 102011	SampType: MBLK	TestCode: PHENOLICS_	Units: mg/L	Prep Date: 10/20/2011	Run I
Client ID: ZZZZZ	Batch ID: 59311	TestNo: SW9066		Analysis Date: 10/20/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Phenolics, Total Recoverable	ND	0.0050							

Sample ID: PHLCSW1 102011	SampType: LCS	TestCode: PHENOLICS_	Units: mg/L	Prep Date: 10/20/2011	Run I
Client ID: ZZZZZ	Batch ID: 59311	TestNo: SW9066		Analysis Date: 10/20/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Phenolics, Total Recoverable	0.1001	0.0050	0.1	0	100	80	120	0	

Sample ID: 11100535-001EMS	SampType: MS	TestCode: PHENOLICS_	Units: mg/L	Prep Date: 10/20/2011	Run I
Client ID: MEN-WWC-101811	Batch ID: 59311	TestNo: SW9066		Analysis Date: 10/20/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Phenolics, Total Recoverable	1.063	0.050	0.2	0.8934	84.7	75	125	0	

Sample ID: 11100535-001EMSD	SampType: MSD	TestCode: PHENOLICS_	Units: mg/L	Prep Date: 10/20/2011	Run I
Client ID: MEN-WWC-101811	Batch ID: 59311	TestNo: SW9066		Analysis Date: 10/20/2011	SeqN

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%
Phenolics, Total Recoverable	1.08	0.050	0.2	0.8934	93.2	75	125	1.063	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the
E - Value above quantitatio

900532

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	ILD005144767	1	877-437-7455	008497951 JJK

5. Generator's Name and Mailing Address
Nicor-Mendota Black Brothers Company/Site
1844 Ferry Road
Naperville, IL 60563
Generator's Phone: 630-388-2381

Generator's Site Address (if different than mailing address)
501 9th Ave
Mendota, IL 61342

6. Transporter 1 Company Name: SET Environmental, Inc.
U.S. EPA ID Number: ILD981957236

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Liquid Environmental Solutions
12123 S. Stony Island Ave
Chicago, IL 60633
Facility's Phone: (773) 646-8700
U.S. EPA ID Number: ILR000115287

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Not Regulated	001	TT	620	G	
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1=034011: Waste water

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Megan Jones for Nicor
Signature: [signature]
Month 11 Day 16 Year 11

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Ebeid Alshawi
Signature: [signature]
Month 11 Day 16 Year 11
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: [illegible]
Signature: [signature]
Month 11 Day 16 Year 11

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR STATE (IF REQUIRED)

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
ILD005144787	1	877-437-7455	008499563 JJK

5. Generator's Name and Mailing Address
Nicor-Mendota Black Brothers Company Site
1844 Ferry Road
Naperville, IL 60563
Generator's Phone: 920-265-9773

Generator's Site Address (if different than mailing address)
501 9th Ave
Mendota, IL 61342

6. Transporter 1 Company Name: SET Environmental, Inc.
U.S. EPA ID Number: ILD981957236

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Liquid Environmental Solutions
12123 S. Stony Island Ave
Chicago, IL 60633
Facility's Phone: (773) 646-9700
U.S. EPA ID Number: ILR000115287

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Not Regulated	1	DM	30	G	
	2. NOT REGULATED	1	DM	30	P	
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1=034011: Waste water (CXSJ)
2 = PPE/DEBRIS (CXSJ)

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Megan Jones for Nicor
Signature: Megan Jones
Month Day Year: 2 13 12

INTL
16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER
17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: STEVE SCHMIDT
Signature:
Month Day Year: 2 13 12
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year:

DESIGNATED FACILITY
18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month Day Year:
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name:
Signature:
Month Day Year:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

55747

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

57758

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
ILD005144787	1	877-437-7455	008496280 JJK

GENERATOR

5. Generator's Name and Mailing Address
Nicor-Mendota Black Brothers Company Site
1844 Ferry Road
Naperville, IL 60563
Generator's Phone: 630-388-2381

Generator's Site Address (if different than mailing address)
501 9th Ave
Mendota, IL 61342

6. Transporter 1 Company Name: SET Environmental, Inc.
U.S. EPA ID Number: ILD981957236

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Liquid Environmental Solutions
12123 S. Stony Island Ave
Chicago, IL 60633
Facility's Phone: (773) 646-9700
U.S. EPA ID Number: ILR000115287

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Not Regulated	1	DM	30	G	
	2. Not Regulated	1	DM	50	P	
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1=034011:Waste water 2=034361:PPE and debris.
(1X55) (1X55)

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Angel Camacho for Nicor
Signature: [signature]
Month Day Year: 5 22 12

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Steve Schmidt
Signature: [signature]
Month Day Year: 5 22 12
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year:

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name
Signature
Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: ILD005144787
2. Page 1 of 1
3. Emergency Response Phone: 877-437-7455
4. Manifest Tracking Number: 010094659 JJK

GENERATOR

5. Generator's Name and Mailing Address
Nicor-Mendota Black Brothers Company Site
1844 Ferry Road
Naperville, IL 60563
Generator's Phone: 630-388-2381

Generator's Site Address (if different than mailing address)
501 9th Ave
Mendota, IL 61342

6. Transporter 1 Company Name: SET Environmental, Inc.
U.S. EPA ID Number: ILD981957236

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Liquid Environmental Solutions
12123 S. Stony Island Ave
Chicago, IL 60633
Facility's Phone: (773) 646-9700
U.S. EPA ID Number: ILR000115287

9a. HM	9b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Not Regulated	01	TP	75	G	
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
I=034011: Waste water

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Angel Camacho for Nicor
Signature:
Month Day Year: 07 25 12

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: James Kocina
Signature:
Month Day Year: 07 25 12
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year:

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Signature: Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: ILD005144787
2. Page 1 of 1
3. Emergency Response Phone: 877-437-7455
4. Manifest Tracking Number: 010096329 JJK

5. Generator's Name and Mailing Address
Nicor-Mendota Black Brothers Company Site
1844 Ferry Road
Naperville, IL 60563
Generator's Phone: ~~630-388-2381~~

Generator's Site Address (if different than mailing address)
501 9th Ave
Mendota, IL 61342

6. Transporter 1 Company Name: SET Environmental, Inc — U.S. EPA ID Number: ILD981957236

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Valley City Environmental Services
1040 Market Street SW
Grand Rapids, MI 49503
Facility's Phone: ~~(616) 235-1500~~
U.S. EPA ID Number: MID981956063

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. Not regulated (waste water)	3	DM	120	G		D29I.	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1=: Waste water (3x55)

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Angel Camacho for Nicor — Signature: [signature] — Month 3 Day 28 Year 13

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:
Transporter signature (for exports only):

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Steven Schmidt — Signature: [signature] — Month 3 Day 28 Year 13
Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name — Signature — Month Day Year

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Form Approved. OMB No. 2050-0039

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: ILD005144787
2. Page 1 of 1
3. Emergency Response Phone: 877-437-7455
4. Manifest Tracking Number: 010096392 JJK

5. Generator's Name and Mailing Address
Nicor-Mendota Black Brothers Company Site
1844 Ferry Road
Naperville, IL 60563
Generator's Phone: 630-388-2381

Generator's Site Address (if different than mailing address)
501 9th Ave
Mendota, IL 61342

6. Transporter 1 Company Name
SET Environmental, Inc.
U.S. EPA ID Number: ILD981957236

7. Transporter 2 Company Name
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Valley City Environmental Services
1040 Market Street SW
Grand Rapids, MI 49503
Facility's Phone: (616) 235-1500
U.S. EPA ID Number: MID981956063

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Not regulated (waste water)	1	PM	15	G	029L
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1=: Waste water
0327130 LIW (1x55)

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Angel Camacho for Nicor
Signature:
Month 04 Day 05 Year 13

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: ~~Michael Nolan~~ Steven Schmidt
Signature:
Month 04 Day 05 Year 13
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name:
Signature:
Month Day Year

GENERATOR
INT'L
TRANSPORTER
DESIGNATED FACILITY

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

APPENDIX L
Non-TACO Remediation Objectives
Mendota MGP - Black Brothers Company Site
Revised SI/ROR/RAP

Appendix L
Tier 1 Non-TACO Remediation Objective Calculations
Revised Site Investigation/Remediation Objectives/Remedial Action Plan
Mendota MGP – Black Brothers Company Site

L.1 INTRODUCTION

The Mendota MGP – Black Brothers Company Site is enrolled in the Illinois Environmental Protection Agency (Illinois EPA) Site Remediation Program (SRP), which uses the Tiered Approach to Corrective Action Objectives (TACO) (35 Illinois Administrative Code [IAC], Part 742, 2013) to evaluate sites. Some non-TACO chemicals included in the SRP target compound and analyte lists are being used for the manufactured gas plant (MGP) focused evaluation of the Site. Table 1 includes a list of these chemicals.

In 2016, Illinois EPA removed the tables containing TACO Tier 1 soil remediation objectives for non-TACO chemicals from their website. These tables were replaced by on-line procedures for calculating Tier 1 remediation objectives entitled "Procedures for Determining Soil Remediation Objectives for Chemicals Not Listed in TACO Regulations" (Illinois EPA 2016a). The table containing Tier 1 groundwater remediation objectives for non-TACO chemicals was updated on March 31, 2016, and is retained on the website (Illinois EPA 2016b).

This appendix presents the calculations of non-TACO soil Tier 1 remediation objectives for these chemicals. The calculations were performed for the ingestion and outdoor inhalation exposure routes for residential, industrial/commercial and construction worker receptor scenarios. In addition, Tier 1 remediation objectives were calculated for the soil component of the Class I and Class II groundwater ingestion exposure route.

L.2 CALCULATIONS

The non-TACO Tier 1 remediation objectives were calculated according to the procedures outlined on the Illinois EPA website as follows:

- The Soil Screening Level (SSL) equations found in TACO, Appendix C, Table A: SSL Equations, were used to calculate the Tier 1 remediation objectives (35 IAC, Part 742, 2013).
- Default human intake factors, e.g. body weight and exposure duration, and default soil physical parameters found in TACO, Appendix C, Table B: SSL Parameters, were used in the calculations (35 IAC, Part 742, 2013).
- The toxicity data and chemical/physical data listed for each chemical in the United States Environmental Protection Agency (USEPA) Regional Screening Level (RSL) tables were used as input parameters (USEPA 2017).
- Subchronic toxicity values not listed in the RSL tables for construction worker ingestion and outdoor inhalation exposure routes were provided by Illinois EPA in an on-line Excel table,

"Subchronic Toxicity Values for Non-TACO Chemicals" posted in 2016. This table also provided a statement that hexachlorobutadiene and 4-nitroaniline "do not meet the Illinois EPA regulatory definition of a carcinogen." (Illinois EPA 2016c). The USEPA RSL Summary Table (USEPA 2017) provides a carcinogenic oral slope factor and inhalation unit risk for hexachlorobutadiene, and a carcinogenic oral slope factor for 4-nitroaniline. In light of the Illinois EPA statement in the subchronic toxicity table, no carcinogenic remediation objectives were calculated for either of these chemicals (Illinois EPA 2016c).

- Non-TACO Tier 1 remediation objectives for Class I and Class II groundwater found in the Illinois EPA on-line Excel table, "Non-TACO Class I and Class II Groundwater Objectives" dated March 31, 2016, were used in the soil component of groundwater ingestion remediation objective calculations (Illinois EPA 2016b).

Some additional input parameters and equations were required to complete the calculations.

- Organic carbon partitioning coefficient (K_{oc}) and unitless Henry's Law Constant (H') for acenaphthylene, benzo(g,h,i)perylene, and phenanthrene required for soil component of groundwater ingestion calculations were obtained from the on-line Oak Ridge National Laboratory (ORNL) Risk Assessment Information System (ORNL 2016).

- No oral reference dose (RfD) value was available in the RSL Summary Table for acenaphthylene, benzo(g,h,i)perylene, or phenanthrene. The RfD for the noncarcinogenic polynuclear aromatic hydrocarbon (PAH) pyrene of 0.03 mg/kg-day from the RSL Summary Table (USEPA 2017) was used to calculate noncarcinogenic soil ingestion Tier 1 remediation objectives for these three chemicals. This substitution is recommended in ASTM International's Standard E1739-95, "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites" (ASTM 2015).

- A set of pH-specific K_{oc} values were required for calculating pH-specific soil component of groundwater ingestion remediation objectives for the ionizing organic chemical 4,6-dinitro-2-methylphenol. The K_{oc} values were calculated using equations found in the USEPA *Soil Screening Guidance: Technical Background Document* (USEPA 1996). A value for 4,6-dinitro-2-methylphenol acid dissociation constant (pKa) needed for an input value calculation was found in the SRC, Inc. PhysProp Database (SRC 2016). $K_{oc,i}$ and $K_{oc,n}$ values required for the pH-specific K_{oc} calculations were not available. $K_{oc,i}$ and $K_{oc,n}$ values for 2,4-dinitrophenol found in the USEPA SSL technical guidance (USEPA 1996) were used in the calculations. The pH-specific concentration for each pH range used in TACO, Appendix B, Tables C and D were determined by calculating a concentration for pH in 0.05 pH unit increments, (e.g., 4.5, 4.55, 4.6, etc.) and calculating an average concentration over the range from the individually calculated concentrations.

Table 1 presents a summary of the calculated non-TACO remediation objectives for soil ingestion and soil outdoor inhalation exposure routes for residential, industrial/commercial and construction worker receptor scenarios, and the soil component of Class I and Class II groundwater ingestion exposure route. Tables 2 through 5 present the input parameters and equations used in the calculations. Tables 6 through 10 present the calculations of the non-TACO Tier 1 remediation objectives.

L.3 REFERENCES

ASTM International, 2015. Standard E1937-95: *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites*, West Conshohocken, Pennsylvania.

Illinois Administrative Code (IAC), 2013. Title 35: Environmental Protection, Subtitle G: Waste Disposal, Chapter I: Pollution Control Board, Subchapter f: Risk Based Cleanup Objectives, Part 742, Tiered Approach to Corrective Action Objectives.

Illinois Environmental Protection Agency (Illinois EPA), 2016a. Procedures for Determining Soil Remediation Objectives for Chemicals Not Listed in TACO Regulations.
Internet Address: http://www.epa.illinois.gov/topics/cleanup-programs/taco/procedures-for-determining-soil-remediation-objectives-for-non-taco-chemicals/index
Accessed May 2016

Illinois EPA, 2016b. Non-TACO Class I and Class II Groundwater Objectives, Excel format.
Internet Address: http://www.epa.illinois.gov/topics/cleanup-programs/taco/other-chemicals/index
Accessed May 2016

Illinois EPA, 2016c. Subchronic Toxicity Values for Non-TACO Chemicals, Excel format.
Internet Address: http://www.epa.illinois.gov/topics/cleanup-programs/taco/index
Accessed May 2016

Oak Ridge National Laboratory, 2016. The Risk Assessment Information System (RAIS), RAIS Toxicity and Properties—Chemical Specific Parameters
Internet Address: https://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem_spef
Accessed June 2016

SRC, Inc., 2016. SRC FatePointers/PhysProp Database—Entry for 4,6-Dinitro-o-Cresol [4,6-Dinitro-2-Methylphenol].
Internet Address: http://esc.syrres.com/fatepointer/webprop.asp?CAS=534521
Accessed June 2016

United States Environmental Protection Agency (USEPA), 1996. *Soil Screening Guidance: Technical Background Document*. Office of Emergency and Remedial Response, Washington, DC. EPA/540/R95/128.

USEPA, 2017. Risk Assessment » Regional Screening Levels (RSLs) - Generic Tables (June 2017), Internet Address: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-june-2017 Accessed June 2017
Files Accessed: (1) Summary Table, Excel format, and (2) Chemical Specific Parameters, Excel format.

Table L-1
Summary of Tier 1 Remediation Objectives - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	Residential		Industrial/Commercial		Construction Worker		Soil Migration to Gr	
	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	
Volatile Organic Compounds (VOCs)								
2-Butanone	47,000	28,000	1,000,000	28,000	410,000	150	18	
Chloroethane	NC	2,100	NC	2,100	20,000	63	NC	
Chloromethane	NC	120	NC	200	NC	42	NC	
2-Hexanone	390	460	10,000	730	1,000	4.7	0.16	
4-Methyl-2-pentanone	NC	3,400	NC	3,400	160,000	100	NC	
1,1,2,2-Tetrachloroethane	3.2	0.7	29	1.3	620	1.9	0.0034	
Semivolatile Organic Compounds (SVOCs)								
2-Chloronaphthalene	6,300	NC	160,000	NC	41,000	NC	58	
Dibenzofuran	78	NC	2,000	NC	820	NC	2.6	
4,6-Dinitro-2-methylphenol	6.3	NC	160	NC	160	NC	See Table L-10	S
Hexachlorobutadiene	78	NC	2,000	NC	200	NC	0.27	
2-Methylnaphthalene	310	NC	8,200	NC	820	NC	2.9	
3-Methylphenol (co-elutes with 4-methylphenol)	3,900	43,000	100,000	43,000	100,000	2,500	5.6	
4-Methylphenol	7,800	230,000	200,000	370,000	4,100	2,400	11	
2-Nitroaniline	780	24	20,000	39	20,000	2	0.88	
4-Nitroaniline	310	2,700	8,200	4,300	2,000	93	0.24	
2,2'-Oxybis(1-chloropropane)	3,100	NC	82,000	NC	200	NC	2.1	
Acenaphthylene	2,300	NC	61,000	NC	61,000	NC	43	
Benzo(g,h,i)perylene	2,300	NC	61,000	NC	61,000	NC	16,000	
Phenanthrene	2,300	NC	61,000	NC	61,000	NC	140	
Metals								
Aluminum*	78,000	1,000,000	1,000,000	1,000,000	200,000	870,000	3.5	
Pesticides								
Dicamba	2,300	NC	61,000	NC	6,100	NC	1.1	
2,4-DB	630	NC	16,000	NC	16,000	NC	See Table L-11	S

Notes:
1) mg/kg - milligrams per kilogram
2) NC - Not calculated; chemical toxicity for this exposure route not available (USEPA 2017) or not applicable per Illinois EPA (Illinois EPA 2016c)
3) * - Soil migration to groundwater remediation objectives are in units of milligrams per liter (mg/L).
4) See Tables L-2 through L-5 for inputs and equations and Tables L-6 through L-11 for calculations of ROs.

Table L-2
Input Values for Residential Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Soil Ingestion Exposure Parameters				
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	6
BW_{nc}	Body weight for noncarcinogens	kg	TACO Appendix C, Table B	15
ED	Exposure duration	year	TACO Appendix C, Table B	6
EF	Exposure frequency	day/year	TACO Appendix C, Table B	350
$IF_{soil\text{-}adj}$	Age adjusted soil ingestion factor for carcinogens	(mg-yr)/(kg-day)	TACO Appendix C, Table B	114
IR_{soil}	Ingestion rate	mg/day	TACO Appendix C, Table B	200
RfD_o	Reference dose	mg/kg-day	USEPA RSL Summary Table[3,4]	Chemical-Specific
SF_o	Oral slope factor	$(mg/kg\text{-}day)^{-1}$	USEPA RSL Summary Table[3]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
Soil Ingestion Tier 1 Remediation Objectives Equations[2]				
$RO_{ingestion}^{carc}$	Soil ingestion remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet AT_c \bullet 365 \frac{d}{yr}}{SF_o \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet IF_{soil-adj}}$	
$RO_{ingestion}^{nc}$	Soil ingestion remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet BW \bullet AT \bullet 365 \frac{d}{yr}}{\frac{1}{RfD_O} \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).
4) No RfD is available for noncarcinogenic PAHs acenaphthylene, benzo(g,h,i)perylene, or phenanthrene. The RfD for noncarcinogenic PAH pyrene was

Table L-2 (Continued)
Input Values for Residential Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Soil Inhalation Exposure Parameters				
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	30
ED	Exposure duration	year	TACO Appendix C, Table B	30
EF	Exposure frequency	day/year	TACO Appendix C, Table B	350
PEF	Particulate emission factor for fugitive dust	m^3/kg	TACO Appendix C, Table B	1.32×10^9
RfC	Reference concentration	$\mu g/m^3$	USEPA RSL Summary Table[3]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
URF	Unit risk factor	$(\mu g/m^3)^{-1}$	USEPA RSL Summary Table[3]	Chemical-Specific
VF	Volatilization factor for organic compounds and mercury	m^3/kg	TACO Appendix C, Table A	Calculated Value
Soil Inhalation Tier 1 Remediation Objectives Equations[2]				
$RO_{inhalation}^{carc}$ Organic Compounds and Mercury	Soil inhalation remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet AT_c \bullet 365 \frac{d}{yr}}{URF \bullet 1{,}000 \frac{ug}{mg} \bullet EF \bullet ED \bullet \frac{1}{VF}}$	
$RO_{inhalation}^{nc}$ Organic Compounds and Mercury	Soil inhalation remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet AT \bullet 365 \frac{d}{yr}}{EF \bullet ED \bullet \left(\frac{1}{RfC} \bullet \frac{1}{VF}\right)}$	
$RO_{inhalation}^{nc}$ Fugitive Dust	Soil inhalation remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet AT \bullet 365 \frac{d}{yr}}{EF \bullet ED \bullet \left(\frac{1}{RfC} \bullet \frac{1}{PEF}\right)}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).

Table L-2 (Continued)
Input Values for Residential Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Variables for Calculated Soil Inhalation Remediation Objectives Parameters				
D_A	Apparent diffusivity	cm^2/s	TACO Appendix C, Table A	Calculated Value
D_i	Diffusivity in air	cm^2/s	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
D_w	Diffusivity in water	cm^2/s	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
$f_{oc}^{surface}$	Organic carbon content	g/g	TACO Appendix C, Table B	0.006
H'	Henry's Law constant	unitless	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
K_d Non-ionizing Organics	Soil-water partition coefficient	cm^3/g or L/kg	TACO Appendix C, Table A	Calculated Value
K_{oc}	Organic carbon partition coefficient	cm^3/g or L/kg	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
Q/C_{VF}	Inverse of the mean concentration at the center of a square source	$(g/m^2\text{-}s)/(kg/m^3)$	TACO Appendix C, Table B	68.81
S	Solubility in water	mg/L	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
T	Exposure interval	s	TACO Appendix C, Table B	9.5×10^8
η	Total soil porosity	L_{pore}/L_{soil}	TACO Appendix C, Table B	0.43
$\theta_a^{surface}$	Air-filled soil porosity	L_{air}/L_{soil}	TACO Appendix C, Table B	0.28
$\theta_w^{surface}$	Water-filled soil porosity	L_{water}/L_{soil}	TACO Appendix C, Table B	0.15
ρ_b	Dry soil bulk density	kg/L or g/cm^3	TACO Appendix C, Table B	1.5
Soil Inhalation Tier 1 Remediation Objectives Input Parameter Equations[2]				
VF Residential and Industrial Commercial	Volatilization factor for organic compounds and mercury	(m^3/kg)	$VF = \frac{Q}{C} \bullet \frac{(3.14 \bullet D_A \bullet T)^{1/2}}{(2 \bullet \rho_b \bullet D_A)} \bullet 10^{-4} \frac{m^2}{cm^2}$	
D_A	Apparent diffusivity	cm^2/s	$D_A = \frac{(\theta_a^{3.33} \bullet D_i \bullet H') + (\theta_w^{3.33} \bullet D_w)}{\eta^2} \bullet \frac{1}{(\rho_b \bullet K_d) + \theta_w + (\theta_a \bullet H')}$	
C_{sat}	Soil saturation concentration	mg/kg	$C_{sat} = \frac{S}{\rho_b} \bullet [(K_d \bullet \rho_b) + \theta_w + (H' \bullet \theta_a)]$	
K_d Non-ionizing Organics	Soil-water partition coefficient	cm^3/g or L/kg	$K_d = K_{oc} \bullet f_{oc}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).

Table L-3
Input Values for Industrial/Commercial Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brother Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
			Soil Ingestion Exposure Parameters	
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	25
BW_c	Body weight for carcinogens	kg	TACO Appendix C, Table B	70
BW_{nc}	Body weight for noncarcinogens	kg	TACO Appendix C, Table B	70
ED	Exposure duration	year	TACO Appendix C, Table B	25
EF	Exposure frequency	day/year	TACO Appendix C, Table B	250
IR_{soil}	Ingestion rate	mg/day	TACO Appendix C, Table B	50
RfD_o	Reference dose	mg/kg-day	USEPA RSL Summary Table[3,4]	Chemical-Specific
SF_o	Oral slope factor	$(mg/kg\text{-}day)^{-1}$	USEPA RSL Summary Table[3]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
			Soil Ingestion Tier 1 Remediation Objectives Equations[2]	
$RO_{ingestion}^{carc}$	Soil ingestion remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet BW \bullet AT_c \bullet 365 \frac{d}{yr}}{SF_o \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	
$RO_{ingestion}^{nc}$	Soil ingestion remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet BW \bullet AT \bullet 365 \frac{d}{yr}}{\frac{1}{RfD_O} \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).
4) No RfD is available for noncarcinogenic PAHs acenaphthylene, benzo(g,h,i)perylene, or phenanthrene. The RfD for noncarcinogenic PAH pyrene was used.

Table L-3 (Continued)
Input Values for Industrial/Commercial Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brother Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Soil Inhalation Exposure Parameters				
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	25
ED	Exposure duration	year	TACO Appendix C, Table B	25
EF	Exposure frequency	day/year	TACO Appendix C, Table B	250
PEF	Particulate emission factor for fugitive dust	m^3/kg	TACO Appendix C, Table A	1.24×10^9
RfC	Reference concentration	$\mu g/m^3$	USEPA RSL Summary Table[3]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
URF	Unit risk factor	$(\mu g/m^3)^{-1}$	USEPA RSL Summary Table[3]	Chemical-Specific
VF	Volatilization factor for organic compounds and mercury	m^3/kg	TACO Appendix C, Table A	Calculated Value
Soil Inhalation Tier 1 Remediation Objectives Equations[2]				
$RO_{inhalation}^{carc}$ Organic Compounds and Mercury	Soil inhalation remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet AT_c \bullet 365 \frac{d}{yr}}{URF \bullet 1{,}000 \frac{ug}{mg} \bullet EF \bullet ED \bullet \frac{1}{VF}}$	
$RO_{inhalation}^{nc}$ Organic Compounds and Mercury	Soil inhalation remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet AT \bullet 365 \frac{d}{yr}}{EF \bullet ED \bullet \left(\frac{1}{RfC} \bullet \frac{1}{VF}\right)}$	
$RO_{inhalation}^{nc}$ Fugitive Dust	Soil inhalation remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet AT \bullet 365 \frac{d}{yr}}{EF \bullet ED \bullet \left(\frac{1}{RfC} \bullet \frac{1}{PEF}\right)}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).

Table L-3 (Continued)
Input Values for Industrial/Commercial Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brother Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Variables for Calculated Soil Inhalation Remediation Objectives Parameters				
D_A	Apparent diffusivity	cm^2/s	TACO Appendix C, Table A	Calculated Value
D_i	Diffusivity in air	cm^2/s	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
D_w	Diffusivity in water	cm^2/s	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
$f_{oc}^{surface}$	Organic carbon content	g/g	TACO Appendix C, Table B	0.006
H'	Henry's Law constant	unitless	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
K_d Non-ionizing Organics	Soil-water partition coefficient	cm^3/g or L/kg	TACO Appendix C, Table A	Calculated Value
K_{oc}	Organic carbon partition coefficient	cm^3/g or L/kg	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
Q/C_{VF}	Inverse of the mean concentration at the center of a square source	$(g/m^2\text{-}s)/(kg/m^3)$	TACO Appendix C, Table B	85.81
S	Solubility in water	mg/L	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
T	Exposure interval	s	TACO Appendix C, Table B	7.9×10^8
η	Total soil porosity	L_{pore}/L_{soil}	TACO Appendix C, Table B	0.43
$\theta_a^{surface}$	Air-filled soil porosity	L_{air}/L_{soil}	TACO Appendix C, Table B	0.28
$\theta_w^{surface}$	Water-filled soil porosity	L_{water}/L_{soil}	TACO Appendix C, Table B	0.15
ρ_b	Dry soil bulk density	kg/L or g/cm^3	TACO Appendix C, Table B	1.5
Soil Inhalation Tier 1 Remediation Objectives Input Parameter Equations[2]				
VF Residential and Industrial Commercial	Volatilization factor for organic compounds and mercury	(m^3/kg)	$VF = \frac{Q}{C} \bullet \frac{(3.14 \bullet D_A \bullet T)^{1/2}}{(2 \bullet \rho_b \bullet D_A)} \bullet 10^{-4} \frac{m^2}{cm^2}$	
D_A	Apparent diffusivity	cm^2/s	$D_A = \frac{(\theta_a^{3.33} \bullet D_i \bullet H') + (\theta_w^{3.33} \bullet D_w)}{\eta^2} \bullet \frac{1}{(\rho_b \bullet K_d) + \theta_w + (\theta_a \bullet H')}$	
C_{sat}	Soil saturation concentration	mg/kg	$C_{sat} = \frac{S}{\rho_b} \bullet [(K_d \bullet \rho_b) + \theta_w + (H' \bullet \theta_a)]$	
K_d Non-ionizing Organics	Soil-water partition coefficient	(m^3/kg)	$K_d = K_{oc} \bullet f_{oc}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Chemical Specific Parameters Table - USEPA Regional Screening Level (RSL) tables (see references).

Table L-4
Input Values for Construction Worker Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brother Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
		Soil Ingestion Exposure Parameters		
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	0.115
BW_c	Body weight for carcinogens	kg	TACO Appendix C, Table B	70
BW_{nc}	Body weight for noncarcinogens	kg	TACO Appendix C, Table B	70
ED	Exposure duration	year	TACO Appendix C, Table B	1
EF	Exposure frequency	day/year	TACO Appendix C, Table B	30
IR_{soil}	Ingestion rate	mg/day	TACO Appendix C, Table B	480
RfD_o	Reference dose	mg/kg-day	USEPA RSL Summary Table[3,4]	Chemical-Specific
SF_o	Oral slope factor	$(mg/kg\text{-}day)^{-1}$	USEPA RSL Summary Table[3]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
		Soil Ingestion Tier 1 Remediation Objectives Equations[2]		
$RO_{ingestion}^{carc}$	Soil ingestion remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet BW \bullet AT_c \bullet 365 \frac{d}{yr}}{SF_o \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	
$RO_{ingestion}^{nc}$	Soil ingestion remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet BW \bullet AT \bullet 365 \frac{d}{yr}}{\frac{1}{RfD_O} \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).
4) No RfD is available for noncarcinogenic PAHs acenaphthylene, benzo(g,h,i)perylene, or phenanthrene. The RfD for noncarcinogenic PAH pyrene was used.

Table L-4 (Continued)
Input Values for Construction Worker Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brother Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Soil Inhalation Exposure Parameters				
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	0.115
ED	Exposure duration	year	TACO Appendix C, Table B	1
EF	Exposure frequency	day/year	TACO Appendix C, Table B	30
PEF'	Particulate emission factor for fugitive dust	m^3/kg	TACO Appendix C, Table A	1.24×10^8
RfC	Reference concentration	$\mu g/m^3$	USEPA RSL Summary Table[3]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
URF	Unit risk factor	$(\mu g/m^3)^{-1}$	USEPA RSL Summary Table[3]	Chemical-Specific
VF	Volatilization factor for organic compounds and mercury	m^3/kg	TACO Appendix C, Table A	Calculated Value
Soil Inhalation Tier 1 Remediation Objectives Equations[2]				
$RO_{inhalation}^{carc}$ Organic Compounds and Mercury	Soil inhalation remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet AT_c \bullet 365 \frac{d}{yr}}{URF \bullet 1{,}000 \frac{ug}{mg} \bullet EF \bullet ED \bullet \frac{1}{VF'}}$	
$RO_{inhalation}^{nc}$ Organic Compounds and Mercury	Soil inhalation remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet AT \bullet 365 \frac{d}{yr}}{EF \bullet ED \bullet \left(\frac{1}{RfC} \bullet \frac{1}{VF'}\right)}$	
$RO_{inhalation}^{nc}$ Fugitive Dust	Soil inhalation remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet AT \bullet 365 \frac{d}{yr}}{EF \bullet ED \bullet \left(\frac{1}{RfC} \bullet \frac{1}{PEF'}\right)}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).

Table L-4 (Continued)
Input Values for Construction Worker Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brother Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Variables for Calculated Soil Inhalation Remediation Objectives Parameters				
D_A	Apparent diffusivity	cm^2/s	TACO Appendix C, Table A	Calculated Value
D_i	Diffusivity in air	cm^2/s	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
D_w	Diffusivity in water	cm^2/s	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
$f_{oc}^{surface}$	Organic carbon content	g/g	TACO Appendix C, Table B	0.006
H'	Henry's Law constant	unitless	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
K_d Non-ionizing Organics	Soil-water partition coefficient	cm^3/g or L/kg	TACO Appendix C, Table A	Calculated Value
K_{oc}	Organic carbon partition coefficient	cm^3/g or L/kg	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
Q/C_{VF}	Inverse of the mean concentration at the center of a square source	$(g/m^2\text{-}s)/(kg/m^3)$	TACO Appendix C, Table B	85.81
S	Solubility in water	mg/L	USEPA RSL Chemical Specific Parameters Table[3]	Chemical-Specific
T	Exposure interval	s	TACO Appendix C, Table B	3.6×10^6
η	Total soil porosity	L_{pore}/L_{soil}	TACO Appendix C, Table B	0.43
$\theta_a^{surface}$	Air-filled soil porosity	L_{air}/L_{soil}	TACO Appendix C, Table B	0.28
$\theta_w^{surface}$	Water-filled soil porosity	L_{water}/L_{soil}	TACO Appendix C, Table B	0.15
ρ_b	Dry soil bulk density	kg/L or g/cm^3	TACO Appendix C, Table B	1.5
Soil Inhalation Tier 1 Remediation Objectives Input Parameter Equations[2]				
VF' Construction Worker	Volatilization factor for organic compounds and mercury	(m^3/kg)	$VF' = \frac{VF}{10}$ Use calculated Industrial/Commercial VF in equation.	
VF Construction Worker	Volatilization factor for organic compounds and mercury	(m^3/kg)	$VF = \frac{Q}{C} \bullet \frac{(3.14 \bullet D_A \bullet T)^{1/2}}{(2 \bullet \rho_b \bullet D_A)} \bullet 10^{-4} \frac{m^2}{cm^2}$	
D_A	Apparent diffusivity	cm^2/s	$D_A = \frac{(\theta_a^{3.33} \bullet D_i \bullet H') + (\theta_w^{3.33} \bullet D_w)}{\eta^2} \bullet \frac{1}{(\rho_b \bullet K_d) + \theta_w + (\theta_a \bullet H')}$	
C_{sat}	Soil saturation concentration	mg/kg	$C_{sat} = \frac{S}{\rho_b} \bullet [(K_d \bullet \rho_b) + \theta_w + (H' \bullet \theta_a)]$	
K_d Non-ionizing Organics	Soil-water partition coefficient	(m^3/kg)	$K_d = K_{oc} \bullet f_{oc}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) USEPA RSL Summary Table - USEPA Regional Screening Level (RSL) tables (see references).

Table L-5
Input Values for Soil Migration to Groundwater Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Soil Component of the Groundwater Ingestion Exposure Parameters				
C_W	Target soil leachate concentration	mg/L	TACO Appendix C, Table A	Calculated Value
H'	Henry's Law constant	unitless	USEPA RSL Chemical Specific Parameters Table[3,4]	Chemical Specific
K_d	Soil-water partition coefficient	cm^3/g or L/kg	TACO Appendix C, Table A	Calculated Value
$\theta_a^{subsurface}$	Air-filled soil porosity	L_{air}/L_{soil}	TACO Appendix C, Table B	0.13
$\theta_w^{subsurface}$	Water-filled soil porosity	L_{water}/L_{soil}	TACO Appendix C, Table B	0.30
ρ_b	Dry soil bulk density	kg/L or g/cm^3	TACO Appendix C, Table B	1.5
Soil Component of Groundwater Ingestion Tier 1 Remediation Objectives Equation[2]				
RO	Soil Component of Groundwater Ingestion	mg/kg	$C_w \bullet \left[K_d + \frac{(\theta_w + \theta_a \bullet H')}{\rho_b} \right]$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) Source for H' and K_{oc} for acenaphthylene, benzo(g,h,i)perylene, and phenanthrene is Oak Ridge National Laboratory Risk Assessment Information System (see references)
4) USEPA RSL Chemical Specific Parameters Table - USEPA Regional Screening Level (RSL) tables (see references)

Table L-5 (Continued)
Input Values for Soil Migration to Groundwater Calculations - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Variables for Calculated Soil Component of Groundwater Ingestion Remediation Objectives Parameters				
DF	Dilution factor	unitless	TACO Appendix C, Table B	20
$f_{oc}^{subsurface}$	Organic carbon content	g/g	TACO Appendix C, Table B	0.002
GW_{obj}	Groundwater remediation objective	mg/L	Non-TACO Table (2016b)[3]	Chemical-Specific
K_{oc}	Organic carbon partition coefficient	cm^3/g or L/kg	USEPA RSL Chemical Specific Parameters Table[4,5]	Chemical-Specific
$K_{oc,i}$	Organic carbon partition coefficient for the ionized species	cm^3/g or L/kg	USEPA Technical Background Document[6]	Chemical-Specific
$K_{oc,n}$	Organic carbon partition coefficient for the neutral species	cm^3/g or L/kg	USEPA Technical Background Document[6]	Chemical-Specific
pH	Negative logarithm to base 10 of the concentration of hydrogen ion	pH units	USEPA Technical Background Document[6]	Varies
pKa	Acid dissociation constant	unitless	USEPA Technical Background Document[6]	Chemical-Specific
Equations for Calculated Soil Component of Groundwater Ingestion Remediation Objectives Parameters[2]				
C_W[1]	Target soil leachate concentration	mg/L	$C_w = DF \bullet GW_{obj}$	
K_d[1]	Soil-water partition coefficient	(m^3/kg)	$K_d = K_{oc} \bullet f_{oc}$	
K_{oc}*[6,7]	Organic carbon partition coefficient	cm^3/g or L/kg	$K_{oc} = K_{oc,n} \cdot \Phi_n + K_{oc,i} \cdot (1 - \Phi_n)$	
$\Phi_{n,\,acid}$[6]	Fraction of neutral species present for acids	cm^3/g or L/kg	$(1 + 10^{pH-pKa})^{-1}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Equations are from TACO, Appendix C, Table A.
3) Groundwater objective listed for acenaphthalene, benzo(g,h,i)perylene, and phenanthrene in non-TACO table was calculated using pyrene RfD.
4) USEPA RSL Chemical Specific Parameters Table - USEPA Regional Screening Level (RSL) tables (see references).
5) Source for H' and K_{oc} for acenaphthylene, benzo(g,h,i)perylene, and phenanthrene is Oak Ridge National Laboratory Risk Assessment Information System (see references).
6) USEPA Soil Screening Guidance: Technical Background Document (see references).
7) * - Koc for ionizing organic chemicals requires pH-specific calculations. See Tables L-10 and L-11 for pH-specific calculations for the soil migration to groundwater remediation objectives.

Tal
Calculation of Residential Soil Ingestion and Inhal
Revised Site Investigation/Remedi
Mendota MGP - Blac

Compound/Analyte	Chemical-Specific Input Parameters								
	Ingestion		Inhalation						
	SF_o $(mg/kg\text{-}day)^{-1}$	RfD_o (mg/kg-day)	D_i (cm^2/sec)	D_w (cm^2/sec)	H' (unitless)	K_{oc} (cm^3/g)	URF $(\mu g/m^3)^{-1}$	RfC (mg/m^3)	
Volatile Organic									
2-Butanone	NA	6.0E-01	9.1E-02	1.0E-05	2.3E-03	4.5E+00	NA	5.0E+00	
Chloroethane	NA	NA	1.0E-01	1.2E-05	4.5E-01	2.2E+01	NA	1.0E+01	
Chloromethane	NA	NA	1.2E-01	1.4E-05	3.6E-01	1.3E+01	NA	9.0E-02	
2-Hexanone	NA	5.0E-03	7.0E-02	8.4E-06	3.8E-03	1.5E+01	NA	3.0E-02	
4-Methyl-2-pentanone	NA	NA	7.0E-02	8.3E-06	5.6E-03	1.3E+01	NA	3.0E+00	
1,1,2,2-Tetrachloroethane	2.0E-01	2.0E-02	4.9E-02	9.3E-06	1.5E-02	9.5E+01	5.80E-05	NA	
Semivolatile Organic									
2-Chloronaphthalene	NA	8.0E-02	NAp	NAp	NAp	NAp	NA	NA	
Dibenzofuran	NA	1.0E-03	NAp	NAp	NAp	NAp	NA	NA	
4,6-Dinitro-2-methylphenol	NA	8.0E-05	NAp	NAp	NAp	NAp	NA	NA	
Hexachlorobutadiene	NR	1.0E-03	NAp	NAp	NAp	NAp	NR	NA	
2-Methylnaphthalene	NA	4.0E-03	NAp	NAp	NAp	NAp	NA	NA	
3-Methylphenol	NA	5.0E-02	7.3E-02	9.3E-06	3.5E-05	3.0E+02	NA	6.0E-01	
4-Methylphenol	NA	1.0E-01	7.2E-02	9.2E-06	4.1E-05	3.0E+02	NA	6.0E-01	
2-Nitroaniline	NA	1.0E-02	5.2E-02	7.4E-06	2.4E-06	1.1E+02	NA	5.0E-05	
4-Nitroaniline	NR	4.0E-03	6.4E-02	9.8E-06	5.2E-08	1.1E+02	NA	6.0E-03	
2,2'-Oxybis(1-chloropropane)	NA	4.0E-02	NAp	NAp	NAp	NAp	NA	NA	
Acenaphthylene*	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA	
Benzo(g,h,i)perylene*	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA	
Phenanthrene*	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA	
M									
Aluminum	NA	1.0E+00	NA	NA	NA	NA	NA	5.0E-03	
Pes									
Dicamba	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA	
2,4-DB	NA	8.0E-03	NAp	NAp	NAp	NAp	NA	NA	

Notes:
1) See Table L-2 for chemical-specific parameter sources.
2) See Table L-2 for calculated input parameter equations and remediation objective (RO) equations.
3) NA - Toxicity information is not available for the exposure route.
4) NAp - Not applicable to the evaluation of this chemical.
5) NC - Not calculated because toxicity information is not available for the exposure route.
6) NR - Chemical does not meet the Illinois EPA regulatory definition of a carcinogen, (Illinois EPA 2016c).
7) If carcinogenic and non-carcinogenic ROs were calculated for a constituent for the ingestion or inhalation exposure route, the lower of the two RO
8) For the outdoor inhalation exposure route, C_{sat} was calculated for constituents with a melting point less than 30°C, and was selected as the RO if
9) * - No RfD is available for noncarcinogenic PAHs acenaphthylene, benzo(g,h,i)perylene, or phenanthrene. The RfD for noncarcinogenic PAH pyre

T

Calculation of Industrial/Commercial Soil Ingestion an
Revised Site Investigation/Remed
Mendota MGP - Bla

Compound/Analyte	Chemical-Specific Input Parameters							
	Ingestion		Inhalation					
	SF_o $(mg/kg\text{-}day)^{-1}$	RfD_o (mg/kg-day)	D_i (cm^2/sec)	D_w (cm^2/sec)	H' (unitless)	K_{oc} (cm^3/g)	URF $(\mu g/m^3)^{-1}$	RfC (mg/m^3)
Volatile Organi								
2-Butanone	NA	6.0E-01	9.1E-02	1.0E-05	2.30E-03	4.5E+00	NA	5.0E+00
Chloroethane	NA	NA	1.0E-01	1.2E-05	4.5E-01	2.2E+01	NA	1.0E+01
Chloromethane	NA	NA	1.2E-01	1.4E-05	3.6E-01	1.3E+01	NA	9.0E-02
2-Hexanone	NA	5.0E-03	7.0E-02	8.4E-06	3.80E-03	1.5E+01	NA	3.0E-02
4-Methyl-2-pentanone	NA	NA	7.0E-02	8.3E-06	5.6E-03	1.3E+01	NA	3.0E+00
1,1,2,2-Tetrachloroethane	2.0E-01	2.0E-02	4.9E-02	9.3E-06	1.5E-02	9.5E+01	5.80E-05	NA
Semivolatile Orga								
2-Chloronaphthalene	NA	8.0E-02	NAp	NAp	NAp	NAp	NA	NA
Dibenzofuran	NA	1.0E-03	NAp	NAp	NAp	NAp	NA	NA
4,6-Dinitro-2-methylphenol	NA	8.0E-05	NAp	NAp	NAp	NAp	NA	NA
Hexachlorobutadiene	NR	1.0E-03	NAp	NAp	NAp	NAp	NR	NA
2-Methylnaphthalene	NA	4.0E-03	NAp	NAp	NAp	NAp	NA	NA
3-Methylphenol	NA	5.0E-02	7.3E-02	9.3E-06	3.5E-05	3.0E+02	NA	6.0E-01
4-Methylphenol	NA	1.0E-01	7.2E-02	9.2E-06	4.1E-05	3.0E+02	NA	6.0E-01
2-Nitroaniline	NA	1.0E-02	5.2E-02	7.4E-06	2.4E-06	1.1E+02	NA	5.0E-05
4-Nitroaniline	NR	4.0E-03	6.4E-02	9.8E-06	5.2E-08	1.1E+02	NA	6.0E-03
2,2'-Oxybis(1-chloropropane)	NA	4.0E-02	NAp	NAp	NAp	NAp	NA	NA
Acenaphthylene*	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA
Benzo(g,h,i)perylene*	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA
Phenanthrene*	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA
Aluminum	NA	1.0E+00	NA	NA	NA	NA	NA	5.0E-03
P								
Dicamba	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA
2,4-DB	NA	8.0E-03	NAp	NAp	NAp	NAp	NA	NA

Notes:

1) See Table L-3 for chemical-specific parameter sources.
2) See Table L-3 for calculated input parameter equations and remediation objective (RO) equations.
3) NA - Toxicity information is not available for the exposure route.
4) NAp - Not applicable to the evaluation of this chemical.
5) NC - Not calculated because toxicity information is not available for the exposure route.
6) NR - Chemical does not meet the Illinois EPA regulatory definition of a carcinogen, (Illinois EPA 2016c).
7) If carcinogenic and non-carcinogenic ROs were calculated for a constituent for the ingestion or inhalation exposure route, the lower of the two R
8) For the outdoor inhalation exposure route, C_{sat} was calculated for constituents with a melting point less than 30°C, and was selected as the RO i
9) * - No RfD is available for noncarcinogenic PAHs acenaphthylene, benzo(g,h,i)perylene, or phenanthrene. The RfD for noncarcinogenic PAH py

Table L-8
Calculation of Construction Worker Soil Ingestion and Inhalation Remediation Objectives - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

	Chemical-Specific Input Parameters									Calculated Input Parameters					Calculation of Soil Ingestion Remediation Objectives			Calculation of Soil Inhalation Remediation Objectives			
	Ingestion		Inhalation							Inhalation											
Compound/Analyte	SF_o (mg/kg-day)$^{-1}$	RfD_o (mg/kg-day)	D_i (cm^2/sec)	D_w (cm^2/sec)	H' (unitless)	K_{oc} (cm^3/g)	URF ($\mu g/m^3)^{-1}$	RfC (mg/m^3)	S (mg/L)	K_d Non-ionizing organics Input-D_A Eq. (cm^3/g)	D_A Input-VF Eq. (cm^2/s)	VF_{CW} (m^3/kg)	VF' (m^3/kg)	PEF (m^3/kg)	$RO_{ingestion}^{carc}$ (mg/kg)	$RO_{ingestion}^{nc}$ (mg/kg)	Selected $RO_{ingestion}$ (mg/kg)	$RO_{inhalation}^{carc}$ (mg/kg)	$RO_{inhalation}^{nc}$ (mg/kg)	C_{sat} (mg/kg)	Selected $RO_{inhalation}$ (mg/kg)
Volatile Organic Compounds (VOCs)																					
2-Butanone	NA	2.0E+00	9.1E-02	1.0E-05	2.30E-03	4.50E+00	NA	1.0E+00	2.2E+05	2.7E-02	8.6E-05	1.0E+03	1.0E+02	NA	NC	4.1E+05	410,000	NC	1.5E+02	2.8E+04	150
Chloroethane	NA	1.0E-01	1.0E-01	1.2E-05	4.5E-01	2.2E+01	NA	4.0E+00	6.7E+03	1.3E-01	7.4E-03	1.1E+02	1.1E+01	NA	NC	2.0E+04	20,000	NC	6.3E+01	2.1E+03	63
Chloromethane	NA	NA	1.2E-01	1.4E-05	3.6E-01	1.3E+01	NA	3.0E+00	5.3E+03	7.8E-02	9.2E-03	1.0E+02	1.0E+01	NA	NC	NC	NC	NC	4.2E+01	1.3E+03	42
2-Hexanone	NA	5.0E-03	7.0E-02	8.4E-06	3.80E-03	1.50E+01	NA	3.0E-02	1.7E+04	9.0E-02	7.3E-05	1.1E+03	1.1E+02	NA	NC	1.0E+03	1,000	NC	4.7E+00	3.3E+03	4.7
4-Methyl-2-pentanone	NA	8.0E-01	7.0E-02	8.3E-06	5.6E-03	1.3E+01	NA	8.0E-01	1.9E+04	7.8E-02	1.1E-04	9.0E+02	9.0E+01	NA	NC	1.6E+05	160,000	NC	1.0E+02	3.4E+03	100
1,1,2,2-Tetrachloroethane	2.0E-01	5.0E-01	4.9E-02	9.3E-06	1.5E-02	9.5E+01	5.8E-05	NA	2.8E+03	5.7E-01	5.7E-05	1.3E+03	1.3E+02	NA	6.2E+02	1.0E+05	620	1.9E+00	NC	1.9E+03	1.9
Semivolatile Organic Compounds (SVOCs)																					
2-Chloronaphthalene	NA	2.0E-01	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	4.1E+04	41,000	NC	NC	NC	NC
Dibenzofuran	NA	4.0E-03	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	8.2E+02	820	NC	NC	NC	NC
4,6-Dinitro-2-methylphenol	NA	8.0E-04	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	1.6E+02	160	NC	NC	NC	NC
Hexachlorobutadiene	NR	1.0E-03	NAp	NAp	NAp	NAp	NR	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	2.0E+02	200	NC	NC	NC	NC
2-Methylnaphthalene	NA	4.0E-03	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	8.2E+02	820	NC	NC	NC	NC
3-Methylphenol	NA	5.0E-01	7.3E-02	9.3E-06	3.5E-05	3.0E+02	NA	6.0E-01	2.3E+04	1.8E+00	1.0E-07	3.0E+04	3.0E+03	NA	NC	1.0E+05	100,000	NC	2.5E+03	4.3E+04	2,500
4-Methylphenol	NA	2.0E-02	7.2E-02	9.2E-06	4.1E-05	3.0E+02	NA	6.0E-01	NAp	1.8E+00	1.1E-07	2.9E+04	2.9E+03	NA	NC	4.1E+03	4,100	NC	2.4E+03	NC	2,400
2-Nitroaniline	NA	1.0E-01	5.2E-02	7.4E-06	2.4E-06	1.1E+02	NA	4.0E-04	NAp	6.6E-01	7.2E-08	3.6E+04	3.6E+03	NA	NC	2.0E+04	20,000	NC	2.0E+00	NC	2.0
4-Nitroaniline	NR	1.0E-02	6.4E-02	9.8E-06	5.2E-08	1.1E+02	NA	2.0E-02	NAp	6.6E-01	8.4E-08	3.3E+04	3.3E+03	NA	NC	2.0E+03	2,000	NC	9.3E+01	NC	93
2,2'-Oxybis(1-chloropropane)	NA	1.0E-03	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	2.0E+02	200	NC	NC	NC	NC
Acenaphthylene*	NA	3.0E-01	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	6.1E+04	61,000	NC	NC	NC	NC
Benzo(g,h,i)perylene*	NA	3.0E-01	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	6.1E+04	61,000	NC	NC	NC	NC
Phenanthrene*	NA	3.0E-01	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	6.1E+04	61,000	NC	NC	NC	NC
Metals																					
Aluminum	NA	1.0E+00	NA	NA	NA	NA	NA	5.0E-03	NAp	NAp	NA	NA	NA	NA	NC	2.0E+05	200,000	NC	8.7E+05	NC	870,000
Pesticides																					
Dicamba	NA	3.0E-02	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	6.1E+03	6,100	NC	NC	NC	NC
2,4-DB	NA	8.0E-02	NAp	NAp	NAp	NAp	NA	NA	NAp	NAp	NAp	NAp	NAp	NA	NC	1.6E+04	16,000	NC	NC	NC	NC

Notes:
1) See Table L-4 for chemical-specific parameter sources.
2) See Table L-4 for calculated input parameter equations and remediation objective (RO) equations.
3) NA - Toxicity information is not available for the exposure route.
4) NAp - Not applicable to the evaluation of this chemical.
5) NC - Not calculated because toxicity information is not available for the exposure route.
6) NR - Chemical does not meet the Illinois EPA regulatory definition of a carcinogen, (Illinois EPA 2016c).
7) If carcinogenic and non-carcinogenic ROs were calculated for a constituent for the ingestion or inhalation exposure route, the lower of the two ROs was selected to evaluate the exposure route.
8) For the outdoor inhalation exposure route, C_{sat} was calculated for constituents with a melting point less than 30°C, and was selected as the RO if C_{sat} was lower than the toxicity-based RO(s).
9) * - No RfD is available for noncarcinogenic PAHs acenaphthylene, benzo(g,h,i)perylene, or phenanthrene. The RfD for noncarcinogenic PAH pyrene was used.

Table L-9
Calculation of Soil Migration to Groundwater Remediation Objectives - Non-TACO Chemicals
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	Class I Groundwater Remediation Objective Parameters		Class II Groundwater Remediation Objective Parameters		Groundwater Remediation Objective Input Parameters			Calculation of Class I Soil Migration to GW ROs	Calculation of Class II Soil Migration to GW ROs
	GW_{obj} (mg/L)	C_w (mg/L)	GW_{obj} (mg/L)	C_w (mg/L)	K_{oc} (cm^3/g)	K_D (cm^3/g)	H' (unitless)	RO_{SMGW} (mg/kg)	RO_{SMGW} (mg/kg)
Volatile Organic Compounds (VOCs)									
2-Butanone	4.2E+00	8.4E+01	4.2E+00	8.4E+01	4.5E+00	9.0E-03	2.3E-03	18	18
Chloroethane	NA	NA	NA	NA	2.2E+01	4.4E-02	4.5E-01	NC	NC
Chloromethane	NA	NA	NA	NA	1.3E+01	2.6E-02	3.6E-01	NC	NC
2-Hexanone	3.5E-02	7.0E-01	3.5E-02	7.0E-01	1.5E+01	3.0E-02	3.8E-03	0.16	0.16
4-Methyl-2-pentanone	NA	NA	NA	NA	1.3E+01	2.6E-02	5.6E-03	NC	NC
1,1,2,2-Tetrachloroethane	4.3E-04	8.6E-03	4.3E-04	8.6E-03	9.5E+01	1.9E-01	1.5E-02	0.0034	0.0034
Semivolatile Organic Compounds (SVOCs)									
2-Chloronaphthalene	5.6E-01	1.1E+01	2.8E+00	5.6E+01	2.5E+03	5.0E+00	1.3E-02	58	290
Dibenzofuran	7.0E-03	1.4E-01	3.5E-02	7.0E-01	9.2E+03	1.8E+01	8.7E-03	2.6	13
4,6-Dinitro-2-methylphenol*	5.6E-04	1.1E-02	2.8E-03	5.6E-02	See Table L-10	See Table L-10	5.7E-05	See Table L-10	See Table L-10
Hexachlorobutadiene	7.0E-03	1.4E-01	3.5E-02	7.0E-01	8.5E+02	1.7E+00	4.2E-01	0.27	1.4
2-Methylnaphthalene	2.8E-02	5.6E-01	1.4E-01	2.8E+00	2.5E+03	5.0E+00	2.1E-02	2.9	15
3-Methylphenol	3.5E-01	7.0E+00	3.5E-01	7.0E+00	3.0E+02	6.0E-01	3.5E-05	5.6	5.6
4-Methylphenol	7.0E-01	1.4E+01	7.0E-01	1.4E+01	3.0E+02	6.0E-01	4.1E-05	11	11
2-Nitroaniline	1.1E-01	2.1E+00	1.1E-01	2.1E+00	1.1E+02	2.2E-01	2.4E-06	0.88	0.88
4-Nitroaniline	2.8E-02	5.6E-01	2.8E-02	5.6E-01	1.1E+02	2.2E-01	5.2E-08	0.24	0.24
2,2'-Oxybis(1-chloropropane)	2.8E-01	5.6E+00	2.8E-01	5.6E+00	8.3E+01	1.7E-01	3.0E-03	2.1	2.1
Acenaphthylene**	2.1E-01	4.2E+00	1.1E+00	2.1E+01	5.0E+03	1.0E+01	4.7E-03	43	220
Benzo(g,h,i)perylene**	2.1E-01	4.2E+00	1.1E+00	2.2E+01	2.0E+06	3.9E+03	1.4E-05	16,000	86,000
Phenanthrene**	2.1E-01	4.2E+00	1.1E+00	2.1E+01	1.7E+04	3.3E+01	1.7E-03	140	710
Metals									
Aluminum (SPLP in mg/L)	3.5E+00	NC	5.0E+00	NC	NA	NA	NA	3.5	3.5
Pesticides									
Dicamba	2.1E-01	4.2E+00	2.1E-01	4.2E+00	2.9E+01	5.8E-02	8.9E-08	1.1	1.1
2,4-DB*	5.6E-02	1.1E+00	5.6E-02	1.1E+00	See Table L-11	See Table L-11	9.4E-08	See Table L-11	See Table L-11

Notes:
1) NA - Toxicity information is not available for the exposure route.
2) NC - Not calculated because toxicity information is not available for the exposure route.
3) * - 4,6-Dinitro-2-methylphenol and 2,4-DB are ionizing organic chemicals. See Tables L-10 and L-11 for the pH-specific calculations for the soil migration to groundwater remediation objectives.
4) See Table L-5 for chemical-specific parameter sources.
5) See Table L-5 for calculated input parameter equations and remediation objective (RO) equations.
6) ** - Groundwater objective listed for acenaphthalene, benzo(g,h,i)perylene, and phenanthrene in non-TACO table was calculated using pyrene RfD.
7) Source for H' and K_{oc} for acenaphthylene, benzo(g,h,i)pyrene, and phenanthrene is Oak Ridge National Laboratory Risk Assessment Information System (see references).

Table L-10
Calculation of pH-Specific Ionizing Organics Soil Migration to Groundwater Remediation Objectives - 4,6-Dinitro-2-methylphenol
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

		K_{oc} Input Parameters				Groundwater Remediation Objective Calculated Input Parameters					Class I Soil Migration to GW ROs		Class II Soil Migration to GW ROs	
Compound/Analyte	pH Range	$K_{oc,n}$ (L/kg)	pH	pKa	$K_{oc,i}$ (L/kg)	K_{oc}* (cm^3/g)	K_D (cm^3/g)	H' (unitless)	$C_{w,Class\ I}$ (mg/L)	$C_{w,Class\ II}$ (mg/L)	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range
4,6-Dinitro-2-methylphenol	4.5 - 4.74	0.8	4.5	4.31	0.01	3.2E-01	6.4E-04	5.7E-05	1.1E-02	5.6E-02	0.00225	0.0022	0.01124	0.011
		0.8	4.55	4.31	0.01	3.0E-01	6.0E-04	5.7E-05	1.1E-02	5.6E-02	0.00225		0.01123	
		0.8	4.6	4.31	0.01	2.8E-01	5.6E-04	5.7E-05	1.1E-02	5.6E-02	0.00225		0.01123	
		0.8	4.65	4.31	0.01	2.6E-01	5.2E-04	5.7E-05	1.1E-02	5.6E-02	0.00225		0.01123	
		0.8	4.7	4.31	0.01	2.4E-01	4.8E-04	5.7E-05	1.1E-02	5.6E-02	0.00225		0.01123	
	4.75 - 5.24	0.8	4.75	4.31	0.01	2.2E-01	4.4E-04	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01122	0.011
		0.8	4.8	4.31	0.01	2.0E-01	4.1E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01122	
		0.8	4.85	4.31	0.01	1.9E-01	3.7E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01122	
		0.8	4.9	4.31	0.01	1.7E-01	3.4E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01122	
		0.8	4.95	4.31	0.01	1.6E-01	3.1E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01122	
		0.8	5.0	4.31	0.01	1.4E-01	2.9E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01122	
		0.8	5.05	4.31	0.01	1.3E-01	2.6E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01122	
		0.8	5.1	4.31	0.01	1.2E-01	2.4E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.15	4.31	0.01	1.1E-01	2.2E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.2	4.31	0.01	1.0E-01	2.0E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
	5.25 - 5.74	0.8	5.25	4.31	0.01	9.1E-02	1.8E-04	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01121	0.011
		0.8	5.3	4.31	0.01	8.3E-02	1.7E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.35	4.31	0.01	7.6E-02	1.5E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.4	4.31	0.01	6.9E-02	1.4E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.45	4.31	0.01	6.3E-02	1.3E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.5	4.31	0.01	5.8E-02	1.2E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.55	4.31	0.01	5.3E-02	1.1E-04	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.6	4.31	0.01	4.9E-02	9.7E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.65	4.31	0.01	4.5E-02	8.9E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01121	
		0.8	5.7	4.31	0.01	4.1E-02	8.2E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
	5.75 - 6.24	0.8	5.75	4.31	0.01	3.8E-02	7.5E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	5.8	4.31	0.01	3.5E-02	7.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	5.85	4.31	0.01	3.2E-02	6.4E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	5.9	4.31	0.01	3.0E-02	6.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	5.95	4.31	0.01	2.8E-02	5.5E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.0	4.31	0.01	2.6E-02	5.2E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.05	4.31	0.01	2.4E-02	4.8E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.1	4.31	0.01	2.3E-02	4.5E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.15	4.31	0.01	2.1E-02	4.3E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.2	4.31	0.01	2.0E-02	4.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	

Notes:
1) * - K_{oc} was calculated according to USEPA guidance on determining K_{oc} for ionizing organic chemicals (see references).
2) Koc,n and Koc,i were not presented in USEPA guidance so input values for similarly acting compound 2,4-dinitrophenol were used.
3) RO is average of values calculated for each 0.05 pH increment within TACO pH range.
3) See Table L-5 for chemical-specific parameter sources.
4) See Table L-5 for calculated input parameter equations and remediation objective (RO) equations.
5) See Table L-9 for groundwater objective values used to calculate Cw values.

Table L-10 (Continued)
Calculation of pH-Specific Ionizing Organics Soil Migration to Groundwater Remediation Objectives - 4,6-Dinitro-2-methylphenol
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

		K_{oc} Input Parameters				Groundwater Remediation Objective Calculated Input Parameters					Class I Soil Migration to GW ROs		Class II Soil Migration to GW ROs	
Compound/Analyte	pH Range	$K_{oc,n}$ (L/kg)	pH	pKa	$K_{oc,i}$ (L/kg)	K_{oc}* (cm^3/g)	K_D (cm^3/g)	H' (unitless)	$C_{w,Class\ I}$ (mg/L)	$C_{w,Class\ II}$ (mg/L)	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range
4,6-Dinitro-2-methylphenol	6.25 - 6.64	0.8	6.25	4.31	0.01	1.9E-02	3.8E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	6.3	4.31	0.01	1.8E-02	3.6E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.35	4.31	0.01	1.7E-02	3.4E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.4	4.31	0.01	1.6E-02	3.3E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.45	4.31	0.01	1.6E-02	3.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.5	4.31	0.01	1.5E-02	3.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.55	4.31	0.01	1.5E-02	2.9E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.6	4.31	0.01	1.4E-02	2.8E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
	6.65 - 6.89	0.8	6.65	4.31	0.01	1.4E-02	2.7E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	6.7	4.31	0.01	1.3E-02	2.6E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.75	4.31	0.01	1.3E-02	2.6E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.8	4.31	0.01	1.3E-02	2.5E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	6.85	4.31	0.01	1.2E-02	2.5E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
	6.9 - 7.24	0.8	6.9	4.31	0.01	1.2E-02	2.4E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	6.95	4.31	0.01	1.2E-02	2.4E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.0	4.31	0.01	1.2E-02	2.3E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.05	4.31	0.01	1.1E-02	2.3E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.1	4.31	0.01	1.1E-02	2.3E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.15	4.31	0.01	1.1E-02	2.2E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.2	4.31	0.01	1.1E-02	2.2E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
	7.25 - 7.74	0.8	7.25	4.31	0.01	1.1E-02	2.2E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	7.3	4.31	0.01	1.1E-02	2.2E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.35	4.31	0.01	1.1E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.4	4.31	0.01	1.1E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.45	4.31	0.01	1.1E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.5	4.31	0.01	1.1E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.55	4.31	0.01	1.0E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.6	4.31	0.01	1.0E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.65	4.31	0.01	1.0E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.7	4.31	0.01	1.0E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	

Notes:
1) * - K_{oc} was calculated according to USEPA guidance on determining K_{oc} for ionizing organic chemicals (see references).
2) Koc,n and Koc,i were not presented in USEPA guidance so input values for similarly acting compound 2,4-dinitrophenol were used.
3) RO is average of values calculated for each 0.05 pH increment within TACO pH range.
3) See Table L-5 for chemical-specific parameter sources.
4) See Table L-5 for calculated input parameter equations and remediation objective (RO) equations.
5) See Table L-9 for groundwater objective values used to calculate Cw values.

Table L-10 (Continued)
Calculation of pH-Specific Ionizing Organics Soil Migration to Groundwater Remediation Objectives - 4,6-Dinitro-2-methylphenol
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

		K_{oc} Input Parameters				Groundwater Remediation Objective Calculated Input Parameters					Class I Soil Migration to GW ROs		Class II Soil Migration to GW ROs	
Compound/Analyte	pH Range	$K_{oc,n}$ (L/kg)	pH	pKa	$K_{oc,i}$ (L/kg)	K_{oc}* (cm^3/g)	K_D (cm^3/g)	H' (unitless)	$C_{w,Class\ I}$ (mg/L)	$C_{w,Class\ II}$ (mg/L)	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range
4,6-Dinitro-2-methylphenol	7.75 - 8.24	0.8	7.75	4.31	0.01	1.0E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	7.8	4.31	0.01	1.0E-02	2.1E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.85	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.9	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	7.95	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.0	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.05	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.1	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.15	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.2	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
	8.25 - 8.74	0.8	8.25	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	8.3	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.35	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.4	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.45	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.5	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.55	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.6	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.65	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.7	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
	8.75 - 9.0	0.8	8.75	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224	0.0022	0.01120	0.011
		0.8	8.8	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.85	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.9	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	8.95	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	
		0.8	9.0	4.31	0.01	1.0E-02	2.0E-05	5.7E-05	1.1E-02	5.6E-02	0.00224		0.01120	

Notes:
1) * - K_{oc} was calculated according to USEPA guidance on determining K_{oc} for ionizing organic chemicals (see references).
2) Koc,n and Koc,i were not presented in USEPA guidance so input values for similarly acting compound 2,4-dinitrophenol were used.
3) RO is average of values calculated for each 0.05 pH increment within TACO pH range.
3) See Table L-5 for chemical-specific parameter sources.
4) See Table L-5 for calculated input parameter equations and remediation objective (RO) equations.
5) See Table L-9 for groundwater objective values used to calculate Cw values.

Table L-11
Calculation of pH-Specific Ionizing Organics Soil Migration to Groundwater Remediation Objectives - 2,4-DB
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	pH Range	K_{oc} Input Parameters				Groundwater Remediation Objective Calculated Input Parameters					Class I Soil Migration to GW ROs		Class II Soil Migration to GW ROs	
		$K_{oc,n}$ (L/kg)	pH	pKa	$K_{oc,i}$ (L/kg)	K_{oc}* (cm^3/g)	K_D (cm^3/g)	H' (unitless)	$C_{w,Class\ I}$ (mg/L)	$C_{w,Class\ II}$ (mg/L)	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range
2,4-DB	4.5 - 4.74	2380	4.5	4.95	36	1.8E+03	3.5E+00	9.4E-08	1.1E+00	1.1E+00	4.18	3.9	4.18	3.9
		2380	4.55	4.95	36	1.7E+03	3.4E+00	9.4E-08	1.1E+00	1.1E+00	4.06		4.06	
		2380	4.6	4.95	36	1.7E+03	3.3E+00	9.4E-08	1.1E+00	1.1E+00	3.93		3.93	
		2380	4.65	4.95	36	1.6E+03	3.2E+00	9.4E-08	1.1E+00	1.1E+00	3.80		3.80	
		2380	4.7	4.95	36	1.5E+03	3.1E+00	9.4E-08	1.1E+00	1.1E+00	3.67		3.67	
	4.75 - 5.24	2380	4.75	4.95	36	1.5E+03	2.9E+00	9.4E-08	1.1E+00	1.1E+00	3.52	2.9	3.52	2.9
		2380	4.8	4.95	36	1.4E+03	2.8E+00	9.4E-08	1.1E+00	1.1E+00	3.38		3.38	
		2380	4.85	4.95	36	1.3E+03	2.7E+00	9.4E-08	1.1E+00	1.1E+00	3.23		3.23	
		2380	4.9	4.95	36	1.3E+03	2.6E+00	9.4E-08	1.1E+00	1.1E+00	3.08		3.08	
		2380	4.95	4.95	36	1.2E+03	2.4E+00	9.4E-08	1.1E+00	1.1E+00	2.93		2.93	
		2380	5.0	4.95	36	1.1E+03	2.3E+00	9.4E-08	1.1E+00	1.1E+00	2.78		2.78	
		2380	5.05	4.95	36	1.1E+03	2.1E+00	9.4E-08	1.1E+00	1.1E+00	2.63		2.63	
		2380	5.1	4.95	36	1.0E+03	2.0E+00	9.4E-08	1.1E+00	1.1E+00	2.48		2.48	
		2380	5.15	4.95	36	9.4E+02	1.9E+00	9.4E-08	1.1E+00	1.1E+00	2.34		2.34	
		2380	5.2	4.95	36	8.8E+02	1.8E+00	9.4E-08	1.1E+00	1.1E+00	2.19		2.19	
	5.25 - 5.74	2380	5.25	4.95	36	8.2E+02	1.6E+00	9.4E-08	1.1E+00	1.1E+00	2.06	1.5	2.06	1.5
		2380	5.3	4.95	36	7.6E+02	1.5E+00	9.4E-08	1.1E+00	1.1E+00	1.93		1.93	
		2380	5.35	4.95	36	7.0E+02	1.4E+00	9.4E-08	1.1E+00	1.1E+00	1.80		1.80	
		2380	5.4	4.95	36	6.5E+02	1.3E+00	9.4E-08	1.1E+00	1.1E+00	1.68		1.68	
		2380	5.45	4.95	36	6.0E+02	1.2E+00	9.4E-08	1.1E+00	1.1E+00	1.57		1.57	
		2380	5.5	4.95	36	5.5E+02	1.1E+00	9.4E-08	1.1E+00	1.1E+00	1.46		1.46	
		2380	5.55	4.95	36	5.1E+02	1.0E+00	9.4E-08	1.1E+00	1.1E+00	1.36		1.36	
		2380	5.6	4.95	36	4.6E+02	9.3E-01	9.4E-08	1.1E+00	1.1E+00	1.27		1.27	
		2380	5.65	4.95	36	4.3E+02	8.5E-01	9.4E-08	1.1E+00	1.1E+00	1.18		1.18	
		2380	5.7	4.95	36	3.9E+02	7.8E-01	9.4E-08	1.1E+00	1.1E+00	1.10		1.10	
	5.75 - 6.24	2380	5.75	4.95	36	3.6E+02	7.1E-01	9.4E-08	1.1E+00	1.1E+00	1.02	0.78	1.02	0.78
		2380	5.8	4.95	36	3.3E+02	6.5E-01	9.4E-08	1.1E+00	1.1E+00	0.955		0.955	
		2380	5.85	4.95	36	3.0E+02	6.0E-01	9.4E-08	1.1E+00	1.1E+00	0.892		0.892	
		2380	5.9	4.95	36	2.7E+02	5.4E-01	9.4E-08	1.1E+00	1.1E+00	0.834		0.834	
		2380	5.95	4.95	36	2.5E+02	5.0E-01	9.4E-08	1.1E+00	1.1E+00	0.782		0.782	
		2380	6.0	4.95	36	2.3E+02	4.6E-01	9.4E-08	1.1E+00	1.1E+00	0.734		0.734	
		2380	6.05	4.95	36	2.1E+02	4.2E-01	9.4E-08	1.1E+00	1.1E+00	0.691		0.691	
		2380	6.1	4.95	36	1.9E+02	3.8E-01	9.4E-08	1.1E+00	1.1E+00	0.652		0.652	
		2380	6.15	4.95	36	1.8E+02	3.5E-01	9.4E-08	1.1E+00	1.1E+00	0.616		0.616	
		2380	6.2	4.95	36	1.6E+02	3.2E-01	9.4E-08	1.1E+00	1.1E+00	0.584		0.584	

Notes:
1) * - K_{oc} was calculated according to USEPA guidance on determining K_{oc} for ionizing organic chemicals (see references).
2) Koc,n and Koc,i were not presented in USEPA guidance so input values for similarly acting compound 2,4,5-trichlorophenol were used.
3) RO is average of values calculated for each 0.05 pH increment within TACO pH range.
3) See Table L-5 for chemical-specific parameter sources.
4) See Table L-5 for calculated input parameter equations and remediation objective (RO) equations.
5) See Table L-9 for groundwater objective values used to calculate Cw values.

Table L-11 (Continued)
Calculation of pH-Specific Ionizing Organics Soil Migration to Groundwater Remediation Objectives - 2,4-DB
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

		K_{oc} Input Parameters				Groundwater Remediation Objective Calculated Input Parameters					Class I Soil Migration to GW ROs		Class I Soil Migration to GW ROs	
Compound/Analyte	pH Range	$K_{oc,n}$ (L/kg)	pH	pKa	$K_{oc,i}$ (L/kg)	K_{oc}* (cm^3/g)	K_D (cm^3/g)	H' (unitless)	$C_{w,Class\ I}$ (mg/L)	$C_{w,Class\ II}$ (mg/L)	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range
2,4-DB	6.25 - 6.64	2380	6.25	4.95	36	1.5E+02	3.0E-01	9.4E-08	1.1E+00	1.1E+00	0.555	0.48	0.555	0.48
		2380	6.3	4.95	36	1.4E+02	2.7E-01	9.4E-08	1.1E+00	1.1E+00	0.529		0.529	
		2380	6.35	4.95	36	1.3E+02	2.5E-01	9.4E-08	1.1E+00	1.1E+00	0.506		0.506	
		2380	6.4	4.95	36	1.2E+02	2.3E-01	9.4E-08	1.1E+00	1.1E+00	0.485		0.485	
		2380	6.45	4.95	36	1.1E+02	2.2E-01	9.4E-08	1.1E+00	1.1E+00	0.466		0.466	
		2380	6.5	4.95	36	1.0E+02	2.0E-01	9.4E-08	1.1E+00	1.1E+00	0.449		0.449	
		2380	6.55	4.95	36	9.3E+01	1.9E-01	9.4E-08	1.1E+00	1.1E+00	0.433		0.433	
		2380	6.6	4.95	36	8.7E+01	1.7E-01	9.4E-08	1.1E+00	1.1E+00	0.420		0.420	
	6.65 - 6.89	2380	6.65	4.95	36	8.2E+01	1.6E-01	9.4E-08	1.1E+00	1.1E+00	0.407	0.39	0.407	0.39
		2380	6.7	4.95	36	7.7E+01	1.5E-01	9.4E-08	1.1E+00	1.1E+00	0.396		0.396	
		2380	6.75	4.95	36	7.3E+01	1.5E-01	9.4E-08	1.1E+00	1.1E+00	0.387		0.387	
		2380	6.8	4.95	36	6.9E+01	1.4E-01	9.4E-08	1.1E+00	1.1E+00	0.378		0.378	
		2380	6.85	4.95	36	6.5E+01	1.3E-01	9.4E-08	1.1E+00	1.1E+00	0.370		0.370	
	6.9 - 7.24	2380	6.9	4.95	36	6.2E+01	1.2E-01	9.4E-08	1.1E+00	1.1E+00	0.363	0.35	0.363	0.35
		2380	6.95	4.95	36	5.9E+01	1.2E-01	9.4E-08	1.1E+00	1.1E+00	0.357		0.357	
		2380	7.0	4.95	36	5.7E+01	1.1E-01	9.4E-08	1.1E+00	1.1E+00	0.351		0.351	
		2380	7.05	4.95	36	5.4E+01	1.1E-01	9.4E-08	1.1E+00	1.1E+00	0.346		0.346	
		2380	7.1	4.95	36	5.2E+01	1.0E-01	9.4E-08	1.1E+00	1.1E+00	0.342		0.342	
		2380	7.15	4.95	36	5.1E+01	1.0E-01	9.4E-08	1.1E+00	1.1E+00	0.338		0.338	
		2380	7.2	4.95	36	4.9E+01	9.8E-02	9.4E-08	1.1E+00	1.1E+00	0.334		0.334	
	7.25 - 7.74	2380	7.25	4.95	36	4.8E+01	9.5E-02	9.4E-08	1.1E+00	1.1E+00	0.331	0.32	0.331	0.32
		2380	7.3	4.95	36	4.6E+01	9.3E-02	9.4E-08	1.1E+00	1.1E+00	0.328		0.328	
		2380	7.35	4.95	36	4.5E+01	9.1E-02	9.4E-08	1.1E+00	1.1E+00	0.325		0.325	
		2380	7.4	4.95	36	4.4E+01	8.9E-02	9.4E-08	1.1E+00	1.1E+00	0.323		0.323	
		2380	7.45	4.95	36	4.3E+01	8.7E-02	9.4E-08	1.1E+00	1.1E+00	0.321		0.321	
		2380	7.5	4.95	36	4.3E+01	8.5E-02	9.4E-08	1.1E+00	1.1E+00	0.319		0.319	
		2380	7.55	4.95	36	4.2E+01	8.4E-02	9.4E-08	1.1E+00	1.1E+00	0.318		0.318	
		2380	7.6	4.95	36	4.1E+01	8.2E-02	9.4E-08	1.1E+00	1.1E+00	0.316		0.316	
		2380	7.65	4.95	36	4.1E+01	8.1E-02	9.4E-08	1.1E+00	1.1E+00	0.315		0.315	
		2380	7.7	4.95	36	4.0E+01	8.0E-02	9.4E-08	1.1E+00	1.1E+00	0.314		0.314	

Notes:
1) * - K_{oc} was calculated according to USEPA guidance on determining K_{oc} for ionizing organic chemicals (see references).
2) Koc,n and Koc,i were not presented in USEPA guidance so input values for similarly acting compound 2,4,5-trichlorophenol were used.
3) RO is average of values calculated for each 0.05 pH increment within TACO pH range.
3) See Table L-5 for chemical-specific parameter sources.
4) See Table L-5 for calculated input parameter equations and remediation objective (RO) equations.
5) See Table L-9 for groundwater objective values used to calculate Cw values.

Table L-11 (Continued)
Calculation of pH-Specific Ionizing Organics Soil Migration to Groundwater Remediation Objectives - 2,4-DB
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

		K_{oc} Input Parameters				Groundwater Remediation Objective Calculated Input Parameters					Class I Soil Migration to GW ROs		Class I Soil Migration to GW ROs	
Compound/Analyte	pH Range	$K_{oc,n}$ (L/kg)	pH	pKa	$K_{oc,i}$ (L/kg)	K_{oc}* (cm^3/g)	K_D (cm^3/g)	H' (unitless)	$C_{w,Class\ I}$ (mg/L)	$C_{w,Class\ II}$ (mg/L)	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range	RO_{SMGW} (mg/kg)	RO_{SMGW} Average Over pH Range
2,4-DB	7.75 - 8.24	2380	7.75	4.95	36	4.0E+01	7.9E-02	9.4E-08	1.1E+00	1.1E+00	0.313	0.31	0.313	0.31
		2380	7.8	4.95	36	3.9E+01	7.9E-02	9.4E-08	1.1E+00	1.1E+00	0.312		0.312	
		2380	7.85	4.95	36	3.9E+01	7.8E-02	9.4E-08	1.1E+00	1.1E+00	0.311		0.311	
		2380	7.9	4.95	36	3.9E+01	7.7E-02	9.4E-08	1.1E+00	1.1E+00	0.311		0.311	
		2380	7.95	4.95	36	3.8E+01	7.7E-02	9.4E-08	1.1E+00	1.1E+00	0.310		0.310	
		2380	8.0	4.95	36	3.8E+01	7.6E-02	9.4E-08	1.1E+00	1.1E+00	0.309		0.309	
		2380	8.05	4.95	36	3.8E+01	7.6E-02	9.4E-08	1.1E+00	1.1E+00	0.309		0.309	
		2380	8.1	4.95	36	3.8E+01	7.5E-02	9.4E-08	1.1E+00	1.1E+00	0.308		0.308	
		2380	8.15	4.95	36	3.7E+01	7.5E-02	9.4E-08	1.1E+00	1.1E+00	0.308		0.308	
		2380	8.2	4.95	36	3.7E+01	7.5E-02	9.4E-08	1.1E+00	1.1E+00	0.308		0.308	
	8.25 - 8.74	2380	8.25	4.95	36	3.7E+01	7.4E-02	9.4E-08	1.1E+00	1.1E+00	0.307	0.31	0.307	0.31
		2380	8.3	4.95	36	3.7E+01	7.4E-02	9.4E-08	1.1E+00	1.1E+00	0.307		0.307	
		2380	8.35	4.95	36	3.7E+01	7.4E-02	9.4E-08	1.1E+00	1.1E+00	0.307		0.307	
		2380	8.4	4.95	36	3.7E+01	7.4E-02	9.4E-08	1.1E+00	1.1E+00	0.307		0.307	
		2380	8.45	4.95	36	3.7E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.306		0.306	
		2380	8.5	4.95	36	3.7E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.306		0.306	
		2380	8.55	4.95	36	3.7E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.306		0.306	
		2380	8.6	4.95	36	3.7E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.306		0.306	
		2380	8.65	4.95	36	3.6E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.306		0.306	
		2380	8.7	4.95	36	3.6E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.306		0.306	
	8.75 - 9.0	2380	8.75	4.95	36	3.6E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.305	0.31	0.305	0.31
		2380	8.8	4.95	36	3.6E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.305		0.305	
		2380	8.85	4.95	36	3.6E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.305		0.305	
		2380	8.9	4.95	36	3.6E+01	7.3E-02	9.4E-08	1.1E+00	1.1E+00	0.305		0.305	
		2380	8.95	4.95	36	3.6E+01	7.2E-02	9.4E-08	1.1E+00	1.1E+00	0.305		0.305	
		2380	9.0	4.95	36	3.6E+01	7.2E-02	9.4E-08	1.1E+00	1.1E+00	0.305		0.305	

Notes:
1) * - K_{oc} was calculated according to USEPA guidance on determining K_{oc} for ionizing organic chemicals (see references).
2) Koc,n and Koc,i were not presented in USEPA guidance so input values for similarly acting compound 2,4,5-trichlorophenol were used.
3) RO is average of values calculated for each 0.05 pH increment within TACO pH range.
3) See Table L-5 for chemical-specific parameter sources.
4) See Table L-5 for calculated input parameter equations and remediation objective (RO) equations.
5) See Table L-9 for groundwater objective values used to calculate Cw values.

APPENDIX M
Soil Saturation Limit Calculations
Mendota MGP - Black Brothers Company Site
Revised SI/ROR/RAP

Table M-1
Calculation of Site-Specific Soil Saturation Limits (C_{sat})
Surface Fill Material
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	S (mg/L)	K_{oc} (L/kg)	f_{oc} (g/g) Surface Fill	K_d (L/kg)	ρ_b (kg/L)	θ_w (L_{water}/L_{soil})	θ_a (L_{air}/L_{soil})	H' (unitless)	Calculated C_{sat}
Volatile Organic Compounds (VOCs) (milligrams per kilogram [mg/kg])									
Benzene	1,800	50.0	0.016	0.800	1.5	0.15	0.28	0.230	1,700
Ethylbenzene	170	320	0.016	5.12	1.5	0.15	0.28	0.324	900
Styrene	310	316	0.016	5.06	1.5	0.15	0.28	0.111	1,600
Toluene	530	158	0.016	2.53	1.5	0.15	0.28	0.271	1,400
Xylenes, Total	110	398	0.016	6.37	1.5	0.15	0.28	0.271	720
Semivolatile Organic Compounds (SVOCs) (milligrams per kilogram [mg/kg])									
2,4-Dimethylphenol	7,900	200	0.016	3	1.5	0.15	0.28	0.000082	26,000

Equation S29: $C_{sat} = \frac{S}{\rho_b} \bullet \left[\left(K_d \bullet \rho_b \right) + \theta_w + \left(H' \bullet \theta_a \right) \right]$

Equation S19: $K_d = K_{oc} \bullet f_{oc}$

Notes:
1) S - Solubility in water (values from TACO, Appendix C, Table E).
2) K_{oc} - Organic carbon partition coefficient (values from TACO, Appendix C, Table E).
3) f_{oc} - Site-Specific organic carbon content of soil.
4) K_d - Soil-water partiton coefficient (calculated using TACO equation S19 in Appendix C, Table A).
5) p_b - Soil particle density (values from TACO, Appendix C, Table B).
6) θ_w - Water-filled soil porosity (values from TACO, Appendix C, Table B).
7) θ_a - Air-filled soil porosity (values from TACO, Appendix C, Table B).
8) H' - Henry's Law Constant (values from TACO, Appendix C, Table E).
9) C_{sat} - Soil saturation limit (calculated using TACO equation S29 in Appendix C, Table A).
10) Compounds shown were detected in surface soil and have melting points less than 30°C.

Table M-2
Calculation of Site-Specific Soil Saturation Limits (C_{sat})
Subsurface Fill Material
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	S (mg/L)	K_{oc} (L/kg)	f_{oc} (g/g) Subsurface Fill	K_d (L/kg)	ρ_b (kg/L)	θ_w (L_{water}/L_{soil})	θ_a (L_{air}/L_{soil})	H' (unitless)	Calculated C_{sat}
Volatile Organic Compounds (VOCs) (milligrams per kilogram [mg/kg])									
Benzene	1,800	50.0	0.016	0.800	1.5	0.30	0.13	0.230	1,800
Ethylbenzene	170	320	0.016	5.12	1.5	0.30	0.13	0.324	910
Styrene	310	316	0.016	5.06	1.5	0.30	0.13	0.111	1,600
Toluene	530	158	0.016	2.528	1.5	0.30	0.13	0.271	1,500
Xylenes, Total	110	398	0.016	6.37	1.5	0.30	0.13	0.271	730
Semivolatile Organic Compounds (SVOCs) (milligrams per kilogram [mg/kg])									
2,4-Dimethylphenol	7,900	200	0.016	3	1.5	0.30	0.13	0.000082	27,000

Equation S29: $C_{sat} = \frac{S}{\rho_b} \bullet \left[\left(K_d \bullet \rho_b \right) + \theta_w + \left(H' \bullet \theta_a \right) \right]$

Equation S19: $K_d = K_{oc} \bullet f_{oc}$

Notes:
1) S - Solubility in water (values from TACO, Appendix C, Table E).
2) K_{oc} - Organic carbon partition coefficient (values from TACO, Appendix C, Table E).
3) f_{oc} - Site-Specific organic carbon content of soil.
4) K_d - Soil-water partiton coefficient (calculated using TACO equation S19 in Appendix C, Table A).
5) ρ_b - Soil particle density (values from TACO, Appendix C, Table B).
6) θ_w - Water-filled soil porosity (values from TACO, Appendix C, Table B).
7) θ_a - Air-filled soil porosity (values from TACO, Appendix C, Table B).
8) H' - Henry's Law Constant (values from TACO, Appendix C, Table E).
9) C_{sat} - Soil saturation limit (calculated using TACO equation S29 in Appendix C, Table A).
10) Compounds shown were detected in surface soil and have melting points less than 30°C.

Table M-3
Calculation of Site-Specific Soil Saturation Limits (C_{sat})
Clay Till
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	S (mg/L)	K_{oc} (L/kg)	f_{oc} (g/g) Silty Clay Till 1	K_d (L/kg)	ρ_b (kg/L)	θ_w (L_{water}/L_{soil})	θ_a (L_{air}/L_{soil})	H' (unitless)	Calculated C_{sat}
Volatile Organic Compounds (VOCs) (milligrams per kilogram [mg/kg])									
Benzene	1,800	50.0	0.0041	0.205	1.5	0.30	0.13	0.230	760
Ethylbenzene	170	320	0.0041	1.31	1.5	0.30	0.13	0.324	260
Styrene	310	316	0.0041	1.30	1.5	0.30	0.13	0.111	470
Toluene	530	158	0.0041	0.65	1.5	0.30	0.13	0.271	460
Xylenes, Total	110	398	0.0041	1.63	1.5	0.30	0.13	0.271	200
Semivolatile Organic Compounds (SVOCs) (mg/kg)									
2,4-Dimethylphenol	7,900	200	0.0041	0.82	1.5	0.30	0.13	0.000082	8,100

Equation S29: $C_{sat} = \frac{S}{\rho_b} \bullet \left[\left(K_d \bullet \rho_b \right) + \theta_w + \left(H' \bullet \theta_a \right) \right]$

Equation S19: $K_d = K_{oc} \bullet f_{oc}$

Notes:
1) S - Solubility in water (values from TACO, Appendix C, Table E).
2) K_{oc} - Organic carbon partition coefficient (values from TACO, Appendix C, Table E).
3) f_{oc} - Site-Specific organic carbon content of soil.
4) K_d - Soil-water partiton coefficient (calculated using TACO equation S19 in Appendix C, Table A).
5) ρ_b - Soil particle density (values from TACO, Appendix C, Table B).
6) θ_w - Water-filled soil porosity (values from TACO, Appendix C, Table B).
7) θ_a - Air-filled soil porosity (values from TACO, Appendix C, Table B).
8) H' - Henry's Law Constant (values from TACO, Appendix C, Table E).
9) C_{sat} - Soil saturation limit (calculated using TACO equation S29 in Appendix C, Table A).
10) Compounds shown were detected in subsurface soil and have melting points less than 30°C.

Table M-4
Calculation of Site-Specific Soil Saturation Limits (C_{sat})
Surface Silty Sand
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	S (mg/L)	K_{oc} (L/kg)	f_{oc} (g/g) Silty Sand Sand Unit 1	K_d (L/kg)	ρ_b (kg/L)	θ_w (L_{water}/L_{soil})	θ_a (L_{air}/L_{soil})	H' (unitless)	Calculated C_{sat}
Volatile Organic Compounds (VOCs) (milligrams per kilogram [mg/kg])									
Benzene	1,800	50.0	0.006	0.300	1.5	0.15	0.28	0.230	800
Ethylbenzene	170	320	0.006	1.920	1.5	0.15	0.28	0.324	350
Styrene	310	316	0.006	1.896	1.5	0.15	0.28	0.111	630
Toluene	530	158	0.006	0.948	1.5	0.15	0.28	0.271	580
Xylenes, Total	110	398	0.006	2.39	1.5	0.15	0.28	0.271	280
Semivolatile Organic Compounds (SVOCs) (milligrams per kilogram [mg/kg])									
2,4-Dimethylphenol	7,900	200	0.006	1.20	1.5	0.15	0.28	0.000082	10,300

Equation S29: $C_{sat} = \frac{S}{\rho_b} \bullet \left[\left(K_d \bullet \rho_b \right) + \theta_w + \left(H' \bullet \theta_a \right) \right]$

Equation S19: $K_d = K_{oc} \bullet f_{oc}$

Notes:
1) S - Solubility in water (values from TACO, Appendix C, Table E).
2) K_{oc} - Organic carbon partition coefficient (values from TACO, Appendix C, Table E).
3) f_{oc} - Site-Specific organic carbon content of soil.
4) Kd - SoiM-water partiton coefficient (calculated using TACO equation S19 in Appendix C, Table A).
5) p_b - Soil particle density (values from TACO, Appendix C, Table B).
6) θ_w - Water-filled soil porosity (values from TACO, Appendix C, Table B).
7) θ_a - Air-filled soil porosity (values from TACO, Appendix C, Table B).
8) H' - Henry's Law Constant (values from TACO, Appendix C, Table E).
9) C_{sat} - Soil saturation limit (calculated using TACO equation S29 in Appendix C, Table A).
10) Compounds shown were detected in subsurface soil and have melting points less than 30°C.

Table M-5
Calculation of Site-Specific Soil Saturation Limits (C_{sat})
Surface Silty Clay
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	S (mg/L)	K_{oc} (L/kg)	f_{oc} (g/g) Silty Clay Till 2	K_d (L/kg)	ρ_b (kg/L)	θ_w (L_{water}/L_{soil})	θ_a (L_{air}/L_{soil})	H' (unitless)	Calculated C_{sat}
Volatile Organic Compounds (VOCs) (milligrams per kilogram [mg/kg])									
Benzene	1,800	50.0	0.0060	0.300	1.5	0.15	0.28	0.230	800
Ethylbenzene	170	320	0.0060	1.92	1.5	0.15	0.28	0.324	350
Styrene	310	316	0.0060	1.90	1.5	0.15	0.28	0.111	630
Toluene	530	158	0.0060	0.95	1.5	0.15	0.28	0.271	580
Xylenes, Total	110	398	0.0060	2.39	1.5	0.15	0.28	0.271	279
Semivolatile Organic Compounds (SVOCs) (milligrams per kilogram [mg/kg])									
2,4-Dimethylphenol	7,900	200	0.0060	1.20	1.5	0.15	0.28	0.000082	10,300

Equation S29: $C_{sat} = \frac{S}{\rho_b} \bullet \left[\left(K_d \bullet \rho_b \right) + \theta_w + \left(H' \bullet \theta_a \right) \right]$

Equation S19: $K_d = K_{oc} \bullet f_{oc}$

Notes:
1) S - Solubility in water (values from TACO, Appendix C, Table E).
2) K_{oc} - Organic carbon partition coefficient (values from TACO, Appendix C, Table E).
3) f_{oc} - Site-Specific organic carbon content of soil.
4) K_d - Soil-water partiton coefficient (calculated using TACO equation S19 in Appendix C, Table A).
5) ρ_b - Soil particle density (values from TACO, Appendix C, Table B).
6) θ_w - Water-filled soil porosity (values from TACO, Appendix C, Table B).
7) θ_a - Air-filled soil porosity (values from TACO, Appendix C, Table B).
8) H' - Henry's Law Constant (values from TACO, Appendix C, Table E).
9) C_{sat} - Soil saturation limit (calculated using TACO equation S29 in Appendix C, Table A).
10) Compounds shown were detected in subsurface soil and have melting points less than 30°C.

Table M-6
Calculation of Site-Specific Soil Saturation Limits (C_{sat})
Subsurface Silty Sand
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	S (mg/L)	K_{oc} (L/kg)	f_{oc} (g/g) Silty Sand Sand Unit 1	K_d (L/kg)	ρ_b (kg/L)	θ_w (L_{water}/L_{soil})	θ_a (L_{air}/L_{soil})	H' (unitless)	Calculated C_{sat}
Volatile Organic Compounds (VOCs) (milligrams per kilogram [mg/kg])									
Benzene	1,800	50.0	0.002	0.100	1.5	0.30	0.13	0.230	580
Ethylbenzene	170	320	0.002	0.640	1.5	0.30	0.13	0.324	150
Styrene	310	316	0.002	0.632	1.5	0.30	0.13	0.111	260
Toluene	530	158	0.002	0.316	1.5	0.30	0.13	0.271	290
Xylenes, Total	110	398	0.002	0.80	1.5	0.30	0.13	0.271	110
Semivolatile Organic Compounds (SVOCs) (milligrams per kilogram [mg/kg])									
2,4-Dimethylphenol	7,900	200	0.002	0.40	1.5	0.30	0.13	0.000082	4,700

Equation S29: $C_{sat} = \frac{S}{\rho_b} \bullet \left[\left(K_d \bullet \rho_b \right) + \theta_w + \left(H' \bullet \theta_a \right) \right]$

Equation S19: $K_d = K_{oc} \bullet f_{oc}$

Notes:
1) S - Solubility in water (values from TACO, Appendix C, Table E).
2) K_{oc} - Organic carbon partition coefficient (values from TACO, Appendix C, Table E).
3) f_{oc} - Site-Specific organic carbon content of soil.
4) K_d - Soil-water partiton coefficient (calculated using TACO equation S19 in Appendix C, Table A).
5) ρ_b - Soil particle density (values from TACO, Appendix C, Table B).
6) θ_w - Water-filled soil porosity (values from TACO, Appendix C, Table B).
7) θ_a - Air-filled soil porosity (values from TACO, Appendix C, Table B).
8) H' - Henry's Law Constant (values from TACO, Appendix C, Table E).
9) C_{sat} - Soil saturation limit (calculated using TACO equation S29 in Appendix C, Table A).
10) Compounds shown were detected in subsurface soil and have melting points less than 30°C.

Table M-7
Calculation of Site-Specific Soil Saturation Limits (C_{sat})
Subsurface Silty Clay
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound/Analyte	S (mg/L)	K_{oc} (L/kg)	f_{oc} (g/g) Silty Clay Till 2	K_d (L/kg)	ρ_b (kg/L)	θ_w (L_{water}/L_{soil})	θ_a (L_{air}/L_{soil})	H' (unitless)	Calculated C_{sat}
Volatile Organic Compounds (VOCs) (milligrams per kilogram [mg/kg])									
Benzene	1,800	50.0	0.0031	0.155	1.5	0.30	0.13	0.230	670
Ethylbenzene	170	320	0.0031	0.99	1.5	0.30	0.13	0.324	210
Styrene	310	316	0.0031	0.98	1.5	0.30	0.13	0.111	370
Toluene	530	158	0.0031	0.49	1.5	0.30	0.13	0.271	380
Xylenes, Total	110	398	0.0031	1.23	1.5	0.30	0.13	0.271	160
Semivolatile Organic Compounds (SVOCs) (milligrams per kilogram [mg/kg])									
2,4-Dimethylphenol	7,900	200	0.0031	0.62	1.5	0.30	0.13	0.000082	6,500

Equation S29: $C_{sat} = \frac{S}{\rho_b} \bullet \left[\left(K_d \bullet \rho_b \right) + \theta_w + \left(H' \bullet \theta_a \right) \right]$

Equation S19: $K_d = K_{oc} \bullet f_{oc}$

Notes:
1) S - Solubility in water (values from TACO, Appendix C, Table E).
2) K_{oc} - Organic carbon partition coefficient (values from TACO, Appendix C, Table E).
3) f_{oc} - Site-Specific organic carbon content of soil.
4) K_d - Soil-water partiton coefficient (calculated using TACO equation S19 in Appendix C, Table A).
5) ρ_b - Soil particle density (values from TACO, Appendix C, Table B).
6) θ_w - Water-filled soil porosity (values from TACO, Appendix C, Table B).
7) θ_a - Air-filled soil porosity (values from TACO, Appendix C, Table B).
8) H' - Henry's Law Constant (values from TACO, Appendix C, Table E).
9) C_{sat} - Soil saturation limit (calculated using TACO equation S29 in Appendix C, Table A).
10) Compounds shown were detected in subsurface soil and have melting points less than 30°C.

APPENDIX N
Carcinogenic PAH Evaluation
Mendota MGP - Black Brothers Company Site
Revised SI/ROR/RAP

Appendix N
Remediation Objective Calculations for Carcinogenic PAHs
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP – Black Brothers Company Site

N-1. INTRODUCTION

The Mendota MGP – Black Brothers Company Site is being evaluated pursuant to the Illinois Environmental Protection Agency (Illinois EPA) Tiered Approach to Corrective Action Objectives (TACO), presented in (Title 35 of the Illinois Administrative Code [IAC], Part 742, 2013).

In January 2017, the United States Environmental Protection Agency (USEPA) published updated ingestion and inhalation toxicity values for benzo(a)pyrene in its online Integrated Risk Information System (IRIS). In response to the USEPA IRIS update, the Illinois EPA updated its "Toxicity Values for Tier 2 and Tier 3 Calculations" tables posted on the TACO webpage to include the benzo(a)pyrene toxicity values and toxicity values for the six other carcinogenic PAHs including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene. Although USEPA published updated toxicity values only for benzo(a)pyrene, Illinois EPA calculated toxicity values for the other six PAHs using the USEPA carcinogenic PAH toxicity equivalency factors (TEFs) published in the *Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons* (USEPA 1993).

The recently published carcinogenic PAH toxicity values were used to calculate Tier 2 and Tier 3 remediation objectives for further evaluation of soil and groundwater at the site. This appendix presents the PAH Tier 2 and Tier 3 remediation objectives calculations for the relevant chemicals and exposure routes. The calculations were performed for the ingestion and outdoor inhalation exposure routes for residential, industrial/commercial and construction worker receptors. Remediation objectives were also calculated for the soil component and direct ingestion component of the Class I groundwater ingestion exposure route.

N-2. CALCULATIONS

The Tier 2 and Tier 3 remediation objectives were calculated according to the procedures outlined in TACO as follows:

- The Soil Screening Level (SSL) equations from TACO, Appendix C, Table A: SSL Equations were used to calculate the Tier 2 and Tier 3 remediation objectives, with the exception of the noncarcinogenic groundwater ingestion remediation objective. This remediation objective was calculated using an equation adapted from Equation R2 in TACO, Appendix C, Table C: RBCA Equations.

- Default human intake factors, e.g. body weight and exposure duration, and default soil physical parameters found in TACO, Appendix C, Table B: SSL Parameters were used in the calculations, consistent with the parameters used to develop Tier 1 remediation objectives.

- The toxicity data listed for each chemical in the TACO online toxicity tables, updated in January 2017, were used as input parameters (Illinois EPA 2017).

- Non-carcinogenic remediation objectives were calculated for chemicals if toxicity data was available for the calculation. The only chemical with applicable non-carcinogenic toxicity data is benzo(a)pyrene.

- The TACO Tier 1 Soil Remediation Objectives tables (Appendix B, Table A and Table B) do no list inhalation remediation objectives for carcinogenic PAHs. The explanation in the footnotes to the tables is that "No toxicity criteria [is] available for the route of exposure." Inhalation toxicity criteria is available for carcinogenic PAHs in the Illinois EPA online Tier 2 and Tier 3 toxicity values tables; therefore, Tier 2 outdoor inhalation remediation objectives were calculated for the PAHs.

- The outdoor inhalation remediation objectives were calculated using TACO SSL Equations 11, 12, 13 and 14 for inhalation of particulate matter that incorporate a particulate emission factor (PEF). The PEF equations were selected because the carcinogenic PAHs are high-molecular weight semivolatile chemicals with physical properties that cause them to adsorb to soil and remain immobile rather than partition to water or volatilize to air (ATSDR 1995). Additionally, these PAHs are excluded from the TACO list of Volatile Chemicals for the Indoor Inhalation Exposure Route (TACO, Appendix A, Table J).

Table N-1 presents a summary of the calculated TACO Tier 2 and Tier 3 remediation objectives for the residential, industrial/commercial, and construction worker ingestion and inhalation, and groundwater ingestion exposure routes. Tables N-2 through N-6 present the default input parameters, references for chemical-specific input parameters and equations used to calculate remediation objectives for residential, industrial/commercial construction worker receptors and the soil component and groundwater component of groundwater ingestion, respectively. Tables N-7 through N-14 present remediation objectives calculations.

N-3. REFERENCES

Agency for Toxic Substances and Disease Registry, 1995. *Toxicological Profile for Polycyclic Aromatic Hydrocarbons (PAHs) prepared by the Syracuse Research Corporation*, Oak Ridge National Laboratory.

Illinois Administrative Code (IAC), 2013. Title 35: Environmental Protection, Subtitle G: Waste Disposal, Chapter I: Pollution Control Board, Subchapter f: Risk Based Cleanup Objectives, Part 742, Tiered Approach to Corrective Action Objectives.

Illinois Environmental Protection Agency (Illinois EPA), 2017. Toxicity Values for Tier 2 and Tier 3 Calculations. Internet Address: http://www.epa.illinois.gov/topics/cleanup-programs/taco/index. Accessed March 2017.

United States Environmental Protection Agency (USEPA), 1993. *Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons.* Document Number EPA/600/R-93/089. July.

USEPA, 2017. Integrated Risk Information System: Benzo(a)pyrene entries. Internet Address: https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=136. Accessed March 2017.

Table N-1
Summary of Remediation Objectives for Carcinogenic PAHs
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Compound	Residential		Industrial/Commercial		Construction Worker		Soil Component of Groundwater Ingestion	Groundwater Ingestion
	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class I (mg/L)
Benzo(a)anthracene	6.4	54,000	57	84,000	1,200	1,000,000	14	0.00085
Benzo(b)fluoranthene	6.4	54,000	57	84,000	1,200	1,000,000	36	0.00085
Benzo(k)fluoranthene	64	540,000	570	840,000	12,000	1,000,000	340	0.0085
Benzo(a)pyrene	0.64	2,800	5.7	3,600	61	5,200	8*	0.0002 **
Chrysene	640	1,000,000	5,700	1,000,000	120,000	1,000,000	1,400	0.085
Dibenzo(a,h)anthracene	0.64	5,400	5.7	8,400	120	180,000	8.5	0.0003 **
Indeno(1,2,3,cd)pyrene	6.4	54,000	57	84,000	1,200	1,000,000	110	0.00085

Notes:
1) PAH - polynuclear aromatic hydrocarbon
2) RO - Remediation Objective
3) mg/kg - milligrams per kilogram
4) mg/L - milligrams per liter
5) * - The calculated remediation objectives for soil migration to groundwater was more stringent than Tier 1 so value shown is Tier 1 remediation objective.
6) ** - Value is the acceptable detection limit (ADL) from TACO, Appendix B, Table E.
7) See Tables N-2 through N-6 for inputs and equations and Tables N-7 through N-14 for calculations of ROs.

Table N-2
Input Values for Residential Calculations
Remediation Objectives for Carcinogenic PAHs
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Soil Ingestion Exposure Parameters				
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	6
BW_{nc}	Body weight for noncarcinogens	kg	TACO Appendix C, Table B	15
ED	Exposure duration	year	TACO Appendix C, Table B	6
EF	Exposure frequency	day/year	TACO Appendix C, Table B	350
$IF_{soil\text{-}adj}$	Age adjusted soil ingestion factor for carcinogens	(mg-yr)/(kg-day)	TACO Appendix C, Table B	114
IR_{soil}	Ingestion rate	mg/day	TACO Appendix C, Table B	200
RfD_o	Reference dose	mg/kg-day	TACO Website[2]	Chemical-Specific
SF_o	Oral slope factor	$(mg/kg\text{-}day)^{-1}$	TACO Website[2]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
Soil Ingestion Remediation Objectives Equations[3]				
$RO_{ingestion}^{carc}$ Equation S2	Soil ingestion remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet AT_c \bullet 365 \frac{d}{yr}}{SF_o \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet IF_{soil-adj}}$	
$RO_{ingestion}^{nc}$ Equation S1	Soil ingestion remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet BW \bullet AT \bullet 365 \frac{d}{yr}}{\frac{1}{RfD_O} \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Illinois EPA TACO website "Toxicity Values for Tier 2 and 3 Calculations" (see references).
3) Equations are from TACO, Appendix C, Table A.
4) carc - carcinogenic chemicals
5) nc - noncarcinogenic chemicals
6) Noncarcinogenic equation used for benzo(a)pyrene, the only carcinogenic PAH with noncarcinogenic toxicity in Illinois EPA toxicity tables.

Table N-2 (Continued)
Input Values for Residential Calculations
Remediation Objectives for Carcinogenic PAHs
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
Soil Outdoor Inhalation Exposure Parameters				
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	30
ED	Exposure duration	year	TACO Appendix C, Table B	30
EF	Exposure frequency	day/year	TACO Appendix C, Table B	350
PEF	Particulate emission factor	m^3/kg	TACO Appendix C, Table B	1.32×10^9
RfC	Reference concentration	mg/m^3	TACO Website[2]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
URF	Unit risk factor	$(\mu g/m^3)^{-1}$	TACO Website[2]	Chemical-Specific
Soil Outdoor Inhalation Remediation Objectives Equations [3]				
$RO_{inhalation}^{carc}$ (Fugitive Dust) Residential and Industrial/Commercial Equation S13	Soil outdoor inhalation remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet AT_C \bullet 365 \frac{d}{yr}}{URF \bullet 1{,}000 \frac{ug}{mg} \bullet EF \bullet ED \bullet \frac{1}{PEF}}$	
$RO_{inhalation}^{nc}$ (Fugitive Dust) Residential and Industrial/Commercial Equation S11	Soil outdoor inhalation remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet AT \bullet 365 \frac{d}{yr}}{EF \bullet ED \bullet \left(\frac{1}{RfC} \bullet \frac{1}{PEF}\right)}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Illinois EPA TACO website "Toxicity Values for Tier 2 and 3 Calculations" (see references).
3) Equations are from TACO, Appendix C, Table A.
4) carc - carcinogenic chemicals
5) nc - noncarcinogenic chemicals
6) Noncarcinogenic equation used for benzo(a)pyrene, the only carcinogenic PAH with noncarcinogenic toxicity in Illinois EPA toxicity tables.

Table N-3
Input Values for Industrial/Commercial Calculations
Remediation Objectives for Carcinogenic PAHs
Revised Site Investigation/Remediation Objectives Report/Remedial Action Plan
Mendota MGP - Black Brothers Company Site

Symbol	Parameter	Units	Equation/Reference	Input Value[1]
		Soil Ingestion Exposure Parameters		
AT_c	Averaging time for carcinogens	year	TACO Appendix C, Table B	70
AT_{nc}	Averaging time for noncarcinogens	year	TACO Appendix C, Table B	25
BW_c	Body weight for carcinogens	kg	TACO Appendix C, Table B	70
BW_{nc}	Body weight for noncarcinogens	kg	TACO Appendix C, Table B	70
ED	Exposure duration	year	TACO Appendix C, Table B	25
EF	Exposure frequency	day/year	TACO Appendix C, Table B	250
IR_{soil}	Ingestion rate	mg/day	TACO Appendix C, Table B	50
RfD_o	Reference dose	mg/kg-day	TACO Website[2]	Chemical-Specific
SF_o	Oral slope factor	$(mg/kg\text{-}day)^{-1}$	TACO Website[2]	Chemical-Specific
THQ	Target hazard quotient	unitless	TACO Appendix C, Table B	1
TR	Target risk	unitless	TACO Appendix C, Table B	1×10^{-6}
		Soil Ingestion Remediation Objectives Equations [3]		
$RO_{ingestion}^{carc}$ Equation S3	Soil ingestion remediation objective for carcinogenic chemicals	mg/kg	$\frac{TR \bullet BW \bullet AT_c \bullet 365 \frac{d}{yr}}{SF_o \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	
$RO_{ingestion}^{nc}$ Equation S1	Soil ingestion remediation objective for noncarcinogenic chemicals	mg/kg	$\frac{THQ \bullet BW \bullet AT \bullet 365 \frac{d}{yr}}{\frac{1}{RfD_O} \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$	

Notes:
1) Numerical values are TACO, Appendix C, Table B default values.
2) Illinois EPA TACO website "Toxicity Values for Tier 2 and 3 Calculations" (see references).
3) Equations are from TACO, Appendix C, Table A.
4) carc - carcinogenic chemicals
5) nc - noncarcinogenic chemicals
6) Noncarcinogenic equation used for benzo(a)pyrene, the only carcinogenic PAH with noncarcinogenic toxicity in Illinois EPA toxicity tables.