

APPENDIX A

GEOTRANS MODEL SIMULATIONS

APPENDIX A.1

GEOTRANS DEWATERING MODEL SIMULATIONS

1. GeoTrans was tasked with performing modeling simulations to evaluate the flow rates needed to dewater the four source areas and the associated volumes. The existing calibrated groundwater flow model and ZONEBUDGET were used for these simulations. The following list contains assumptions for these simulations:
 - Each source area has five days to start excavation before dewatering occurs;
 - Excavation time for each of the source areas are 55 days for Drip Track, 80 days for North Lagoon, 105 days for South Lagoon, and 110 days for Process Area;
 - Order of excavation occurs in a counter-clockwise fashion starting with the Drip Track Area;
 - Dewatering occurs 24 hours a day, 7 days a week;
 - The split between dewatering and quasi steady state approximately occurs when the water levels plateau; and
 - Given the time frame for excavation, true steady-state conditions cannot occur, thus, the term quasi steady state is used.

2. Figures A.1 through A.4 show the temporal water levels near the center of each of the four source areas. For the North Lagoon and Process Area, water levels decline a couple of feet before dewatering starts due to dewatering in the Drip Track and South Lagoon source areas. This influence of drains in other source areas is also evident in the dewatering flow rates, volumes, and times shown in Table 1. Table A.1 also presents quasi steady-state flow rates and volumes. Tables A.2 to A.5 show flow rates and volumes for each time step in the model where the drains for a particular source area were in operation. The total flow rate into the drains is a combination of horizontal flow in the Surficial Aquifer (flow rate into drains in Tables A.2 to A.5) and vertical flow from the underlying Hawthorn Clay (Upward flow from UHG Clay in Tables A.2 to A.5) due to a reversal in the vertical hydraulic gradient. The time step was decreased to 2 hours for the first stress period (2 days in duration) where dewatering was occurring to obtain a more accurate estimate of the dewatering flow rate. Note the model will tend to under predict dewatering flow rates, volumes, and times for the following reasons:
 - MODFLOW cannot account for gravity drainage during dewatering;

- Fine-grained sediment layers in the Surficial Aquifer will increase dewatering time; and
- Sediments will approach 100 percent saturation; therefore, drippage will occur while excavating.

TABLE A.1
**SUMMARY OF DEWATERING/
 QUASI STEADY-STATE RATES AND VOLUMES**

Source Area	Average Dewatering Flow Rate (gpm)	Dewatering Volume (gallons)	Approximate Time for Dewatering (days)	Average Quasi Steady-State Flow Rate (gpm)	Quasi Steady-State Volume (gallons)
Drip Track	90	2,595,951	20	57	2,293,496
North Lagoon	70	2,010,093	20	38	2,863,887
South Lagoon	80	4,031,365	35	42	3,812,092
Process Area	51	1,257,904	17	29	3,581,920

**TABLE A.2
DEWATERING RATES AND
VOLUMES FROM DRIP TRACK AREA**

Excavation Time (days)	Flow Rate into Drains (gpm)	Upward flow from UHG Clay (gpm)	Total Flow Rate (gpm)	Volume (gallons)
2.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00
5.08	371.90	0.00	371.90	44,627.72
5.17	342.79	0.00	342.79	41,134.92
5.25	319.37	0.00	319.37	38,324.11
5.33	299.91	0.01	299.92	35,990.43
5.42	283.34	0.04	283.38	34,005.37
5.50	268.95	0.06	269.01	32,280.76
5.58	256.25	0.08	256.32	30,758.65
5.67	244.91	0.09	245.00	29,399.84
5.75	234.69	0.12	234.80	28,176.45
5.83	225.40	0.13	225.53	27,063.32
5.92	216.90	0.14	217.05	26,045.46
6.00	209.10	0.15	209.25	25,110.39
6.08	201.91	0.16	202.07	24,248.15
6.17	195.24	0.17	195.41	23,449.39
6.25	189.05	0.18	189.23	22,707.28
6.33	183.29	0.18	183.47	22,016.83
6.42	177.91	0.19	178.10	21,372.44
6.50	172.88	0.20	173.08	20,769.76
6.58	168.17	0.21	168.38	20,205.95
6.67	163.75	0.21	163.97	19,675.89
6.75	159.60	0.22	159.81	19,177.72
6.83	155.69	0.22	155.91	18,709.43
6.92	152.01	0.23	152.23	18,267.92
7.00	148.53	0.24	148.77	17,851.87
8.00	122.89	0.25	123.14	177,321.46
9.00	106.39	0.27	106.66	153,587.67
10.00	95.29	0.28	95.57	137,623.60
12.00	82.94	0.29	83.23	239,689.75
15.00	73.32	0.29	73.61	317,978.90
17.00	69.06	0.29	69.35	199,713.85
20.00	65.03	0.28	65.32	282,171.36
22.00	63.03	0.28	63.31	182,340.11
25.00	60.87	0.28	61.15	264,154.04
27.00	59.72	0.28	60.00	172,795.24
30.00	58.39	0.28	58.67	253,439.25
32.00	56.83	0.27	57.10	164,447.73
35.00	54.94	0.27	55.21	238,499.60
37.00	53.87	0.27	54.13	155,900.07
40.00	52.50	0.26	52.76	227,935.39
42.00	51.69	0.26	51.95	149,621.71
45.00	50.63	0.26	50.89	219,858.48
47.00	50.02	0.26	50.28	144,806.46
50.00	50.02	0.26	50.27	217,184.36
52.00	48.65	0.26	48.91	140,846.77
55.00	47.93	0.25	48.19	208,161.18

**TABLE A.3
DEWATERING RATES AND
VOLUMES FROM NORTH LAGOON**

Excavation Time (days)	Flow Rate into Drains (gpm)	Upward flow from UHG Clay (gpm)	Total Flow Rate (gpm)	Volume (gallons)
2.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00
5.08	269.88	0.00	269.88	32,385.17
5.17	250.19	0.00	250.19	30,022.57
5.25	234.09	0.00	234.09	28,090.71
5.33	221.07	0.00	221.07	26,527.90
5.42	209.76	0.00	209.76	25,171.43
5.50	200.30	0.00	200.30	24,036.26
5.58	191.98	0.00	191.98	23,037.60
5.67	184.56	0.00	184.56	22,147.62
5.75	177.89	0.00	177.89	21,346.73
5.83	171.82	0.00	171.82	20,618.76
5.92	166.27	0.01	166.27	19,952.48
6.00	161.15	0.01	161.16	19,338.67
6.08	156.41	0.01	156.42	18,769.81
6.17	152.00	0.01	152.01	18,240.85
6.25	147.87	0.01	147.88	17,746.06
6.33	144.01	0.01	144.03	17,283.10
6.42	140.37	0.02	140.39	16,846.90
6.50	136.95	0.02	136.97	16,436.24
6.58	133.71	0.02	133.73	16,048.00
6.67	130.66	0.02	130.67	15,680.94
6.75	127.75	0.02	127.77	15,332.73
6.83	124.99	0.02	125.02	15,001.92
6.92	122.37	0.03	122.40	14,687.96
7.00	119.88	0.03	119.90	14,388.36
8.00	99.88	0.05	99.93	143,894.44
9.00	86.39	0.06	86.45	124,494.48
10.00	76.90	0.08	76.99	110,862.74
12.00	65.81	0.11	65.92	189,852.89
15.00	56.98	0.13	57.11	246,725.88
17.00	53.10	0.14	53.24	153,323.11
20.00	49.51	0.15	49.66	214,519.59
22.00	47.77	0.15	47.92	138,021.47
25.00	45.97	0.15	46.12	199,259.36
27.00	45.03	0.15	45.18	130,119.75
30.00	43.97	0.15	44.12	190,607.25
32.00	43.40	0.15	43.55	125,433.93
35.00	42.70	0.15	42.85	185,106.46
37.00	41.11	0.15	41.26	118,827.17
40.00	39.51	0.14	39.66	171,322.22
42.00	38.65	0.14	38.79	111,724.55
45.00	37.59	0.14	37.73	162,997.22
47.00	36.96	0.13	37.10	106,845.93
50.00	36.14	0.13	36.27	156,673.50
52.00	35.63	0.13	35.76	102,988.30
55.00	34.94	0.13	35.06	151,470.02
57.00	34.50	0.13	34.63	99,724.33
60.00	33.90	0.12	34.02	146,973.11
62.00	33.52	0.12	33.64	96,870.35
65.00	32.98	0.12	33.09	142,968.85
67.00	32.25	0.12	32.36	93,210.07
70.00	31.42	0.11	31.53	136,203.55
72.00	30.92	0.11	31.03	89,368.75
75.00	30.27	0.11	30.37	131,212.10
77.00	29.85	0.10	29.96	86,282.39
80.00	29.29	0.10	29.39	126,957.32

**TABLE A.4
DEWATERING RATES AND
VOLUMES FROM SOUTH LAGOON**

Excavation Time (days)	Flow Rate into Drains (gpm)	Upward flow from UHG Clay (gpm)	Total Flow Rate (gpm)	Volume (gallons)
2.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00
5.08	400.83	0.00	400.83	48,099.32
5.17	372.13	0.00	372.13	44,655.77
5.25	349.25	0.00	349.25	41,910.41
5.33	330.87	0.00	330.87	39,704.89
5.42	314.87	0.00	314.87	37,784.26
5.50	301.50	0.00	301.50	36,180.31
5.58	289.33	0.00	289.33	34,719.11
5.67	278.88	0.00	278.88	33,466.11
5.75	269.42	0.00	269.43	32,331.08
5.83	260.78	0.00	260.78	31,293.32
5.92	252.82	0.00	252.82	30,338.55
6.00	245.45	0.01	245.45	29,454.18
6.08	238.59	0.01	238.60	28,631.44
6.17	232.18	0.01	232.19	27,863.08
6.25	226.17	0.01	226.18	27,142.05
6.33	220.52	0.01	220.53	26,463.34
6.42	215.18	0.01	215.19	25,823.22
6.50	210.13	0.02	210.15	25,217.53
6.58	205.35	0.02	205.36	24,643.62
6.67	200.81	0.02	200.82	24,098.96
6.75	196.48	0.02	196.50	23,580.48
6.83	192.36	0.02	192.39	23,086.31
6.92	188.44	0.02	188.46	22,615.40
7.00	184.68	0.03	184.71	22,164.83
8.00	153.77	0.05	153.82	221,504.49
9.00	132.33	0.08	132.40	190,660.77
10.00	116.82	0.10	116.92	168,360.76
12.00	97.79	0.14	97.93	282,037.78
15.00	81.61	0.17	81.78	353,284.90
17.00	74.32	0.18	74.50	214,569.39
20.00	67.12	0.19	67.31	290,784.38
22.00	63.43	0.19	63.63	183,243.85
25.00	59.35	0.19	59.54	257,196.16
27.00	57.11	0.19	57.30	165,015.75
30.00	54.43	0.19	54.62	235,943.20
32.00	52.90	0.18	53.08	152,876.45
35.00	50.97	0.18	51.14	220,945.18
37.00	49.84	0.18	50.01	144,031.16
40.00	48.36	0.17	48.53	209,642.84
42.00	47.48	0.17	47.65	137,232.29
45.00	46.30	0.16	46.46	200,703.66
47.00	45.71	0.16	45.87	132,103.04
50.00	44.91	0.16	45.07	194,710.21
52.00	44.38	0.15	44.53	128,248.55
55.00	43.67	0.15	43.82	189,318.58
57.00	43.22	0.14	43.36	124,876.94
60.00	42.59	0.14	42.74	184,621.61
62.00	42.18	0.14	42.32	121,886.03
65.00	41.64	0.14	41.78	180,490.75
67.00	41.28	0.13	41.41	119,252.80
70.00	40.79	0.13	40.92	176,753.03
72.00	40.48	0.13	40.61	116,944.90
75.00	40.02	0.13	40.15	173,446.50
77.00	39.64	0.12	39.76	114,515.68
80.00	39.64	0.12	39.76	171,760.05
82.00	39.64	0.12	39.76	114,504.52
85.00	38.31	0.12	38.43	166,020.94
87.00	38.02	0.12	38.13	109,824.57
90.00	37.61	0.11	37.73	162,976.68
92.00	37.35	0.11	37.46	107,894.55
95.00	36.98	0.11	37.09	160,243.13
97.00	36.74	0.11	36.85	106,127.99
100.00	36.40	0.11	36.51	157,735.77
102.00	36.19	0.11	36.29	104,523.47
105.00	35.87	0.09	35.97	155,376.12

**TABLE A.5
DEWATERING RATES AND
VOLUMES FROM FORMER PROCESS AREA**

Excavation Time (days)	Flow Rate into Drains (gpm)	Upward flow from UHG Clay (gpm)	Total Flow Rate (gpm)	Volume (gallons)
2.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00
5.08	218.04	0.00	218.04	26,165.10
5.17	198.91	0.00	198.91	23,869.19
5.25	183.26	0.00	183.26	21,990.95
5.33	170.24	0.00	170.24	20,429.38
5.42	159.28	0.00	159.28	19,113.43
5.50	149.91	0.00	149.91	17,988.85
5.58	141.82	0.00	141.82	17,018.25
5.67	134.76	0.00	134.76	16,171.08
5.75	128.54	0.00	128.54	15,424.90
5.83	123.02	0.00	123.02	14,762.87
5.92	118.09	0.00	118.09	14,170.66
6.00	113.65	0.00	113.65	13,637.67
6.08	109.63	0.00	109.63	13,155.17
6.17	105.96	0.00	105.96	12,715.69
6.25	102.61	0.00	102.61	12,312.99
6.33	99.53	0.00	99.53	11,943.32
6.42	96.68	0.00	96.68	11,601.71
6.50	94.05	0.00	94.05	11,285.66
6.58	91.60	0.00	91.60	10,991.44
6.67	89.31	0.00	89.31	10,717.20
6.75	87.17	0.00	87.17	10,460.41
6.83	85.16	0.00	85.16	10,219.20
6.92	83.27	0.00	83.27	9,992.96
7.00	81.49	0.00	81.49	9,779.18
8.00	67.96	0.01	67.96	97,868.51
9.00	58.86	0.02	58.87	84,777.98
10.00	52.45	0.02	52.47	75,563.36
12.00	44.89	0.04	44.93	129,387.85
15.00	38.85	0.06	38.92	168,122.06
17.00	36.23	0.08	36.31	104,574.64
20.00	33.90	0.10	34.00	146,865.44
22.00	32.81	0.11	32.93	94,826.53
25.00	31.79	0.12	31.92	137,873.14
27.00	31.31	0.13	31.44	90,560.62
30.00	30.84	0.13	30.97	133,797.04
32.00	30.25	0.13	30.38	87,501.89
35.00	29.68	0.14	29.81	128,794.23
37.00	29.35	0.14	29.49	84,933.29
40.00	28.97	0.14	29.11	125,754.17
42.00	28.75	0.14	28.88	83,183.87
45.00	28.45	0.14	28.59	123,509.43
47.00	28.27	0.13	28.40	81,800.99
50.00	28.02	0.13	28.15	121,606.10
52.00	27.86	0.13	27.99	80,620.80
55.00	27.64	0.13	27.77	119,962.19
57.00	27.49	0.13	27.62	79,555.40
60.00	27.29	0.13	27.41	118,424.46
62.00	27.10	0.13	27.23	78,422.86
65.00	26.87	0.12	26.99	116,612.88
67.00	26.69	0.12	26.82	77,231.51
70.00	26.46	0.12	26.58	114,810.61
72.00	26.31	0.12	26.42	76,103.01
75.00	26.09	0.12	26.21	113,226.73
77.00	25.95	0.11	26.07	75,071.66
80.00	25.75	0.11	25.86	111,732.52
82.00	25.62	0.11	25.73	74,116.40
85.00	25.43	0.11	25.54	110,337.88
87.00	25.31	0.11	25.42	73,195.84
90.00	25.12	0.11	25.23	108,992.03
92.00	26.02	0.10	26.12	75,222.10
95.00	26.83	0.10	26.93	116,324.10
97.00	27.30	0.10	27.39	78,894.57
100.00	27.92	0.10	28.02	121,031.17
102.00	28.30	0.10	28.41	81,807.33
105.00	28.86	0.10	28.97	125,138.35
107.00	29.23	0.11	29.33	126,721.45
110.00	29.76	0.11	29.87	129,049.06

Figure A.1
Drip Track Water Level Elevations

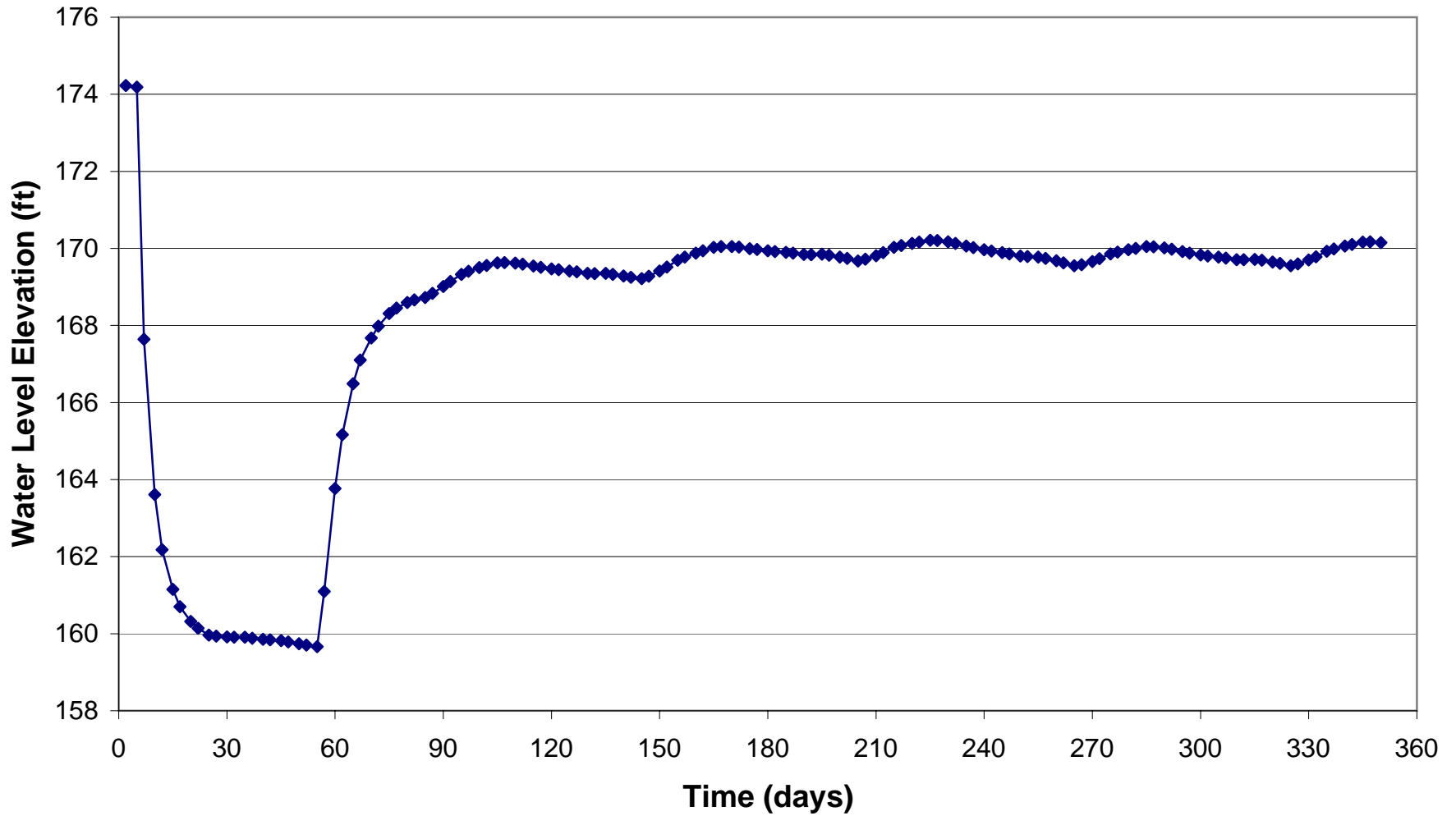


Figure A.2
North Lagoon Water Level Elevations

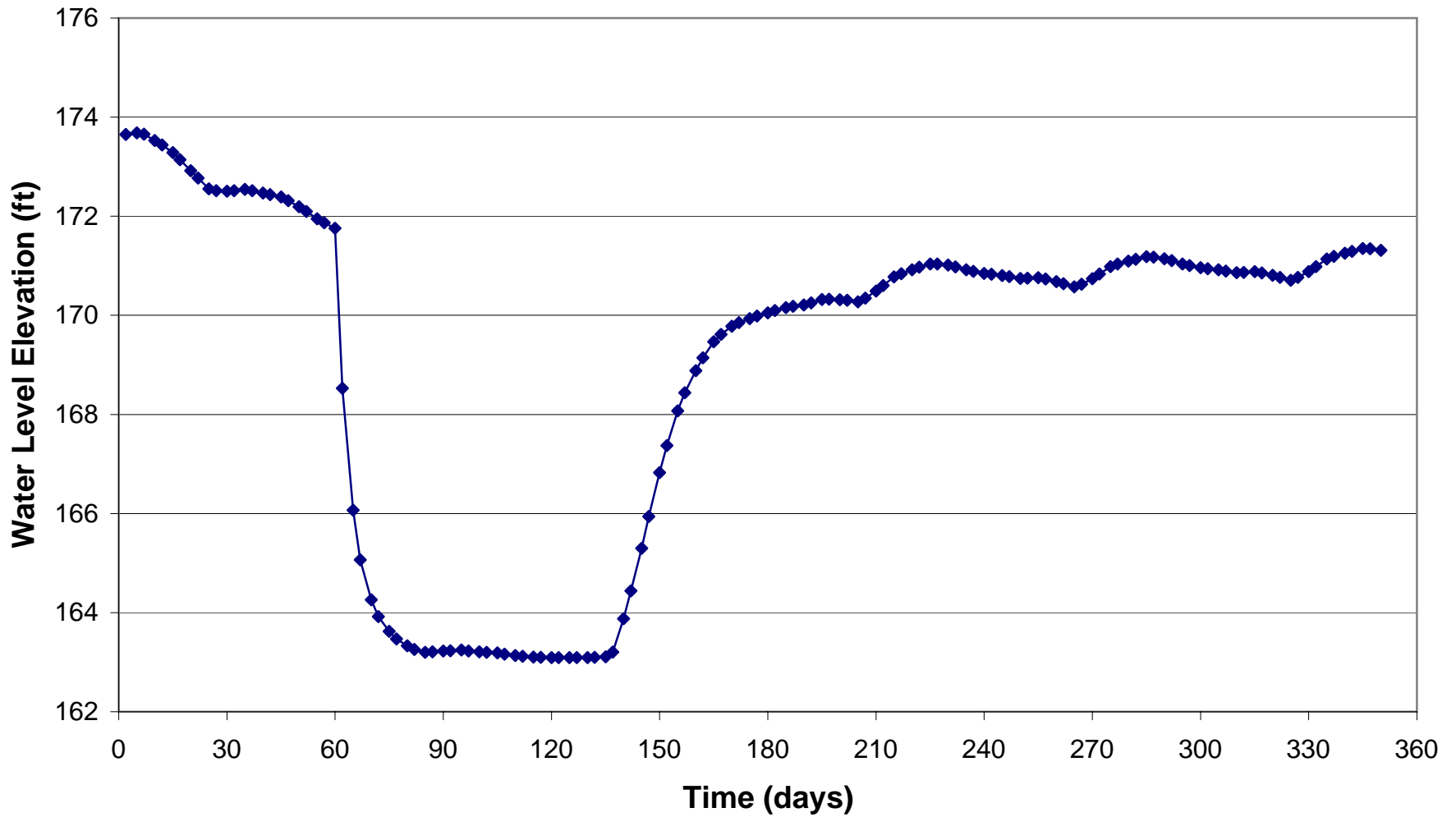


Figure A.3
South Lagoon Water Level Elevations

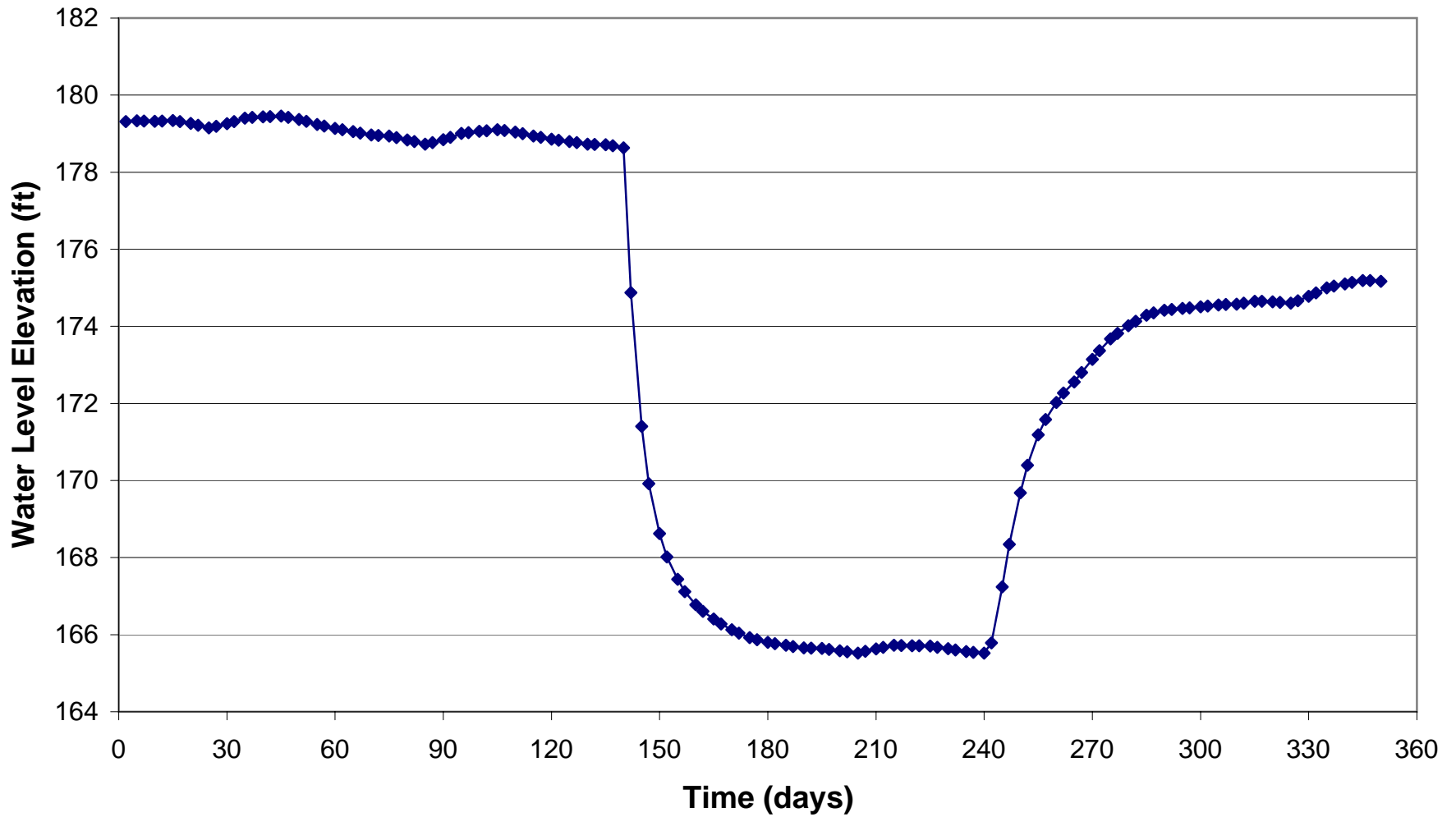
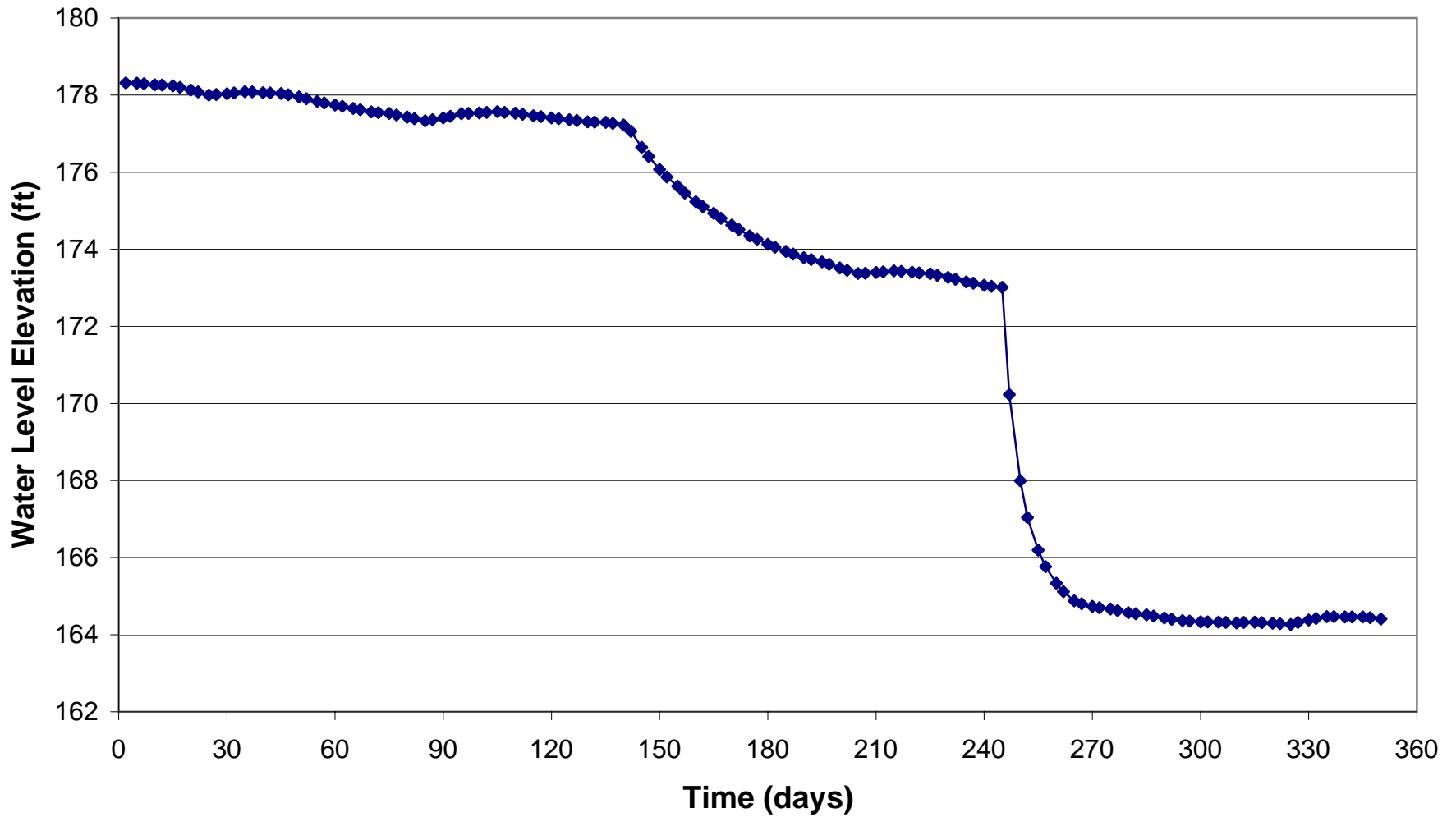


Figure A.4
Process Area Water Level Elevations



APPENDIX A.2

GEOTRANS RISK REDUCTION MODEL SIMULATIONS

GeoTrans was tasked with performing modeling simulations to evaluate COI concentrations after source removal. The existing calibrated groundwater flow and transport model was used for these simulations. The following list contains assumptions for the model simulations:

- A point source of 0.0 µg/L of naphthalene in the four source areas was simulated using the naphthalene steady-state distribution from the modeling report as an initial condition.
- A point source of 0.0 µg/L of arsenic in the Process Area was simulated using the arsenic distribution from the modeling report as an initial condition.
- Soil used as fill after excavation was “contaminant free” and fully saturated.

Figure 5.2 of the main report shows the naphthalene distribution after 15 years. Naphthalene has migrated toward the extraction well system and has biodegraded to less than 40 ppb on and offsite. Source removal in the Surficial Aquifer has a negligible effect on concentrations in the Upper Hawthorn, Lower Hawthorn, and Upper Floridan Aquifer due to the presence of DNAPL sources in Upper and Lower Hawthorn groups beneath the source areas.

Figure 5.3 of the main report shows the arsenic distribution after 100 years. Since arsenic does not biodegrade, the plume slowly migrates toward the extraction well system. The peak arsenic concentration has decreased from 5,280 to approximately 1,100 µg/L in the Surficial Aquifer. Arsenic concentrations in the Hawthorn Group show a minimal reduction due to source removal in the Surficial Aquifer.

APPENDIX B

TRAFFIC SAFETY FACTS 2002



Traffic Safety Facts 2002

Large Trucks



A Public Information Fact Sheet on Motor Vehicle and Traffic Safety Published by the National Highway Traffic Safety Administration's National Center for Statistics and Analysis

In 2002, 434,000 large trucks (gross vehicle weight rating greater than 10,000 pounds) were involved in traffic crashes in the United States; 4,542 were involved in fatal crashes. A total of 4,897 people died (11 percent of all the traffic fatalities reported in 2002) and an additional 130,000 were injured in those crashes.

In 2001, large trucks accounted for 4 percent of all registered vehicles and 7 percent of total vehicle miles traveled (2002 registered vehicle and vehicle miles traveled data not available). In 2002, large trucks accounted for 8 percent of all vehicles involved in fatal crashes and 4 percent of all vehicles involved in injury and property-damage-only crashes.

Table 1. Involvement in Fatal and Injury Crashes and Involvement Rates for Large Trucks, 1992-2002

Year	Number of Large Trucks Involved in Fatal Crashes	Number of Large Trucks Registered	Vehicle Involvement Rate*	Vehicle Miles Traveled (millions)	Vehicle Involvement Rate**
1992	4,035	6,045,205	66.75	153,384	2.63
1993	4,328	6,088,155	71.09	159,888	2.71
1994	4,644	6,587,885	70.49	170,216	2.73
1995	4,472	6,719,421	66.55	178,156	2.51
1996	4,755	7,012,615	67.81	182,971	2.60
1997	4,917	7,083,326	69.42	191,477	2.57
1998	4,955	7,732,270	64.08	196,380	2.52
1999	4,920	7,791,426	63.15	202,688	2.43
2000	4,995	8,022,649	62.26	205,520	2.43
2001	4,823	7,857,674	61.38	207,686	2.32
2002	4,542	—	—	—	—

Year	Number of Large Trucks Involved in Injury Crashes	Number of Large Trucks Registered	Vehicle Involvement Rate*	Vehicle Miles Traveled (millions)	Vehicle Involvement Rate**
1992	95,000	6,045,205	1,567	153,384	62
1993	97,000	6,088,155	1,585	159,888	60
1994	96,000	6,587,885	1,452	170,216	56
1995	84,000	6,719,421	1,244	178,156	47
1996	94,000	7,012,615	1,339	182,971	51
1997	96,000	7,083,326	1,349	191,477	50
1998	89,000	7,732,270	1,146	196,380	45
1999	101,000	7,791,426	1,292	202,688	50
2000	101,000	8,022,649	1,253	205,520	49
2001	90,000	7,857,674	1,145	207,686	43
2002	94,000	—	—	—	—

*Rate per 100,000 registered vehicles.

**Rate per 100 million vehicle miles traveled.

— = not available.

Source: Vehicle miles traveled and registered vehicles — Federal Highway Administration.

“One out of nine traffic fatalities in 2002 resulted from a collision involving a large truck.”

One out of nine traffic fatalities in 2002 resulted from a collision involving a large truck.

Of the fatalities that resulted from crashes involving large trucks, 79 percent were occupants of another vehicle, 7 percent were nonoccupants, and 14 percent were occupants of a large truck.

Of the injuries that resulted from crashes involving large trucks, 77 percent were occupants of another vehicle, 3 percent were nonoccupants, and 20 percent were occupants of a large truck.

Table 2. Fatalities and Injuries in Crashes Involving Large Trucks, 2002

Type of Fatality	Number	Percentage of Total
Occupants of Large Trucks	684	14
<i>Single-Vehicle Crashes</i>	447	9
<i>Multiple-Vehicle Crashes</i>	237	5
Occupants of Other Vehicles in Crashes Involving Large Trucks	3,853	79
Nonoccupants (Pedestrians, Pedalcyclists, etc.)	360	7
Total	4,897	100
Type of Injury	Number	Percentage of Total
Occupants of Large Trucks	26,000	20
<i>Single-Vehicle Crashes</i>	12,000	9
<i>Multiple-Vehicle Crashes</i>	14,000	11
Occupants of Other Vehicles in Crashes Involving Large Trucks	100,000	77
Nonoccupants (Pedestrians, Pedalcyclists, etc.)	4,000	3
Total	130,000	100

“In 2002, large trucks were nearly 2.5 times as likely as other vehicles to be struck in the rear in two-vehicle fatal crashes.”

Large trucks were much more likely to be involved in a fatal multiple-vehicle crash — as opposed to a fatal single-vehicle crash — than were passenger vehicles (84 percent of all large trucks involved in fatal crashes, compared with 61 percent of all passenger vehicles).

In 29 percent of the two-vehicle fatal crashes involving a large truck and another type of vehicle, both vehicles were impacted in the front. The truck was struck in the rear nearly 2.5 times as often as the other vehicle (17 percent and 7 percent, respectively).

Table 3. Principal Impact Points in Two-Vehicle Fatal Crashes Involving Large Trucks, 2002

Impact Point on Large Truck	Impact Point on Other Vehicle				
	Front	Left Side	Right Side	Rear	Total
Front	29%	18%	13%	6%	66%
Left Side	8%	1%	<1%	<1%	10%
Right Side	6%	<1%	<1%	<1%	7%
Rear	16%	<1%	<1%	<1%	17%
Total	59%	20%	14%	7%	100%

In 50 percent of the two-vehicle fatal crashes involving a large truck and another type of vehicle, both vehicles were proceeding straight at the time of the crash. In 9 percent of the crashes, the other vehicle was turning. In 9 percent, either the truck or the other vehicle was negotiating a curve. In 7 percent, either the truck or the other vehicle was stopped or parked in a traffic lane (5 percent and 2 percent, respectively).

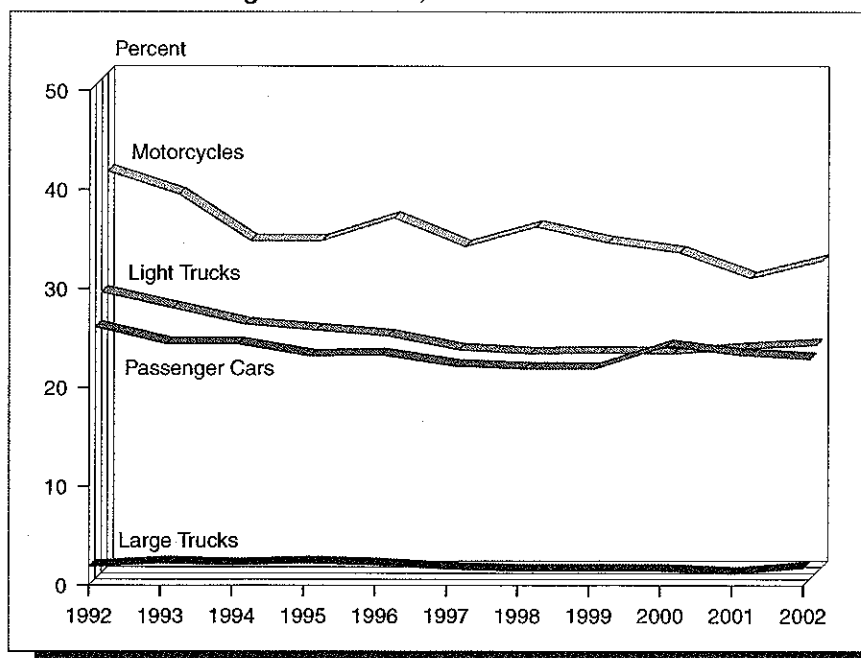
Most of the fatal crashes involving large trucks occurred in rural areas (67 percent), during the daytime (67 percent), and on weekdays (80 percent). During the week, 75 percent of the crashes occurred during the daytime (6:00 AM to 5:59 PM). On weekends, 63 percent occurred at night (6:00 PM to 5:59 AM).

In 2001, NHTSA began using a revised method — multiple imputation — to estimate missing information about blood alcohol concentration (BAC) levels for persons involved in fatal crashes. The alcohol estimates in this fact sheet are based on the new imputation method. More information on the new multiple imputation method, including detailed tabulations of alcohol involvement in various categories (age, sex, time of day, etc.), is available in NHTSA Technical Report DOT HS 809 403, Transitioning to Multiple Imputation: A New Method to Estimate Missing Blood Alcohol Concentration (BAC) Values in FARS.

The percentage of large truck drivers involved in fatal crashes who were intoxicated — with blood alcohol concentrations (BAC) of 0.08 grams per deciliter (g/dl) or greater — was 2 percent in 2002. Intoxication rates for drivers of other types of vehicles involved in fatal crashes in 2002 were 22 percent for passenger cars, 23 percent for light trucks, and 31 percent for motorcycles.

“The intoxication rate for drivers of large trucks involved in fatal crashes in 2002 was 2 percent.”

Figure 1. Estimated Proportions of Drivers in Fatal Crashes with BAC 0.08 g/dl or Greater, 1992-2002

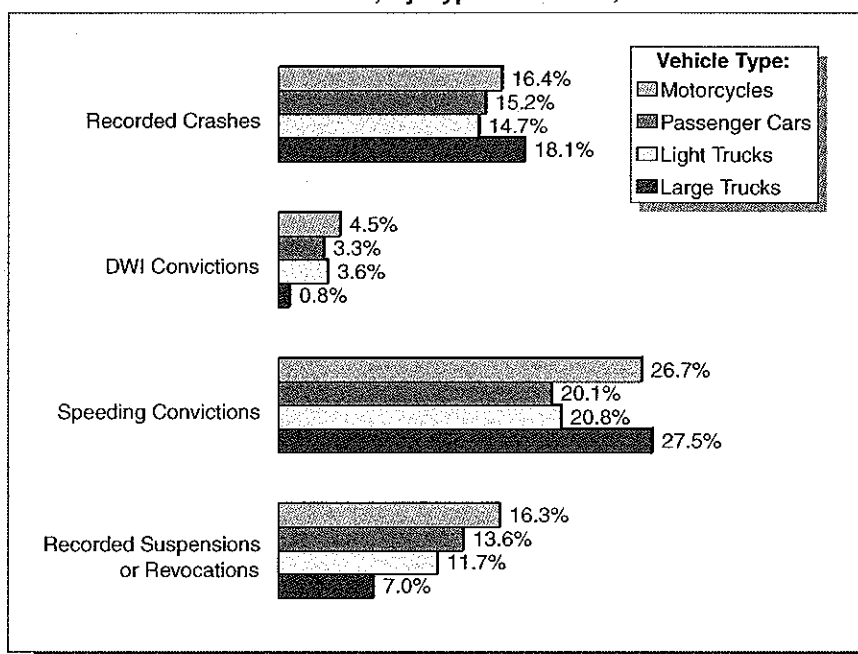


Drivers of large trucks were less likely to have a previous license suspension or revocation than were passenger car drivers (7 percent and 14 percent, respectively).

Almost 28 percent of all large truck drivers involved in fatal crashes in 2002 had at least one prior speeding conviction, compared to 20 percent of the passenger car drivers involved in fatal crashes.

“Drivers of large trucks were less likely to have a previous license suspension or revocation than were passenger car drivers.”

Figure 2. Previous Driving Records of Drivers Involved in Fatal Traffic Crashes, by Type of Vehicle, 2002



For more information:

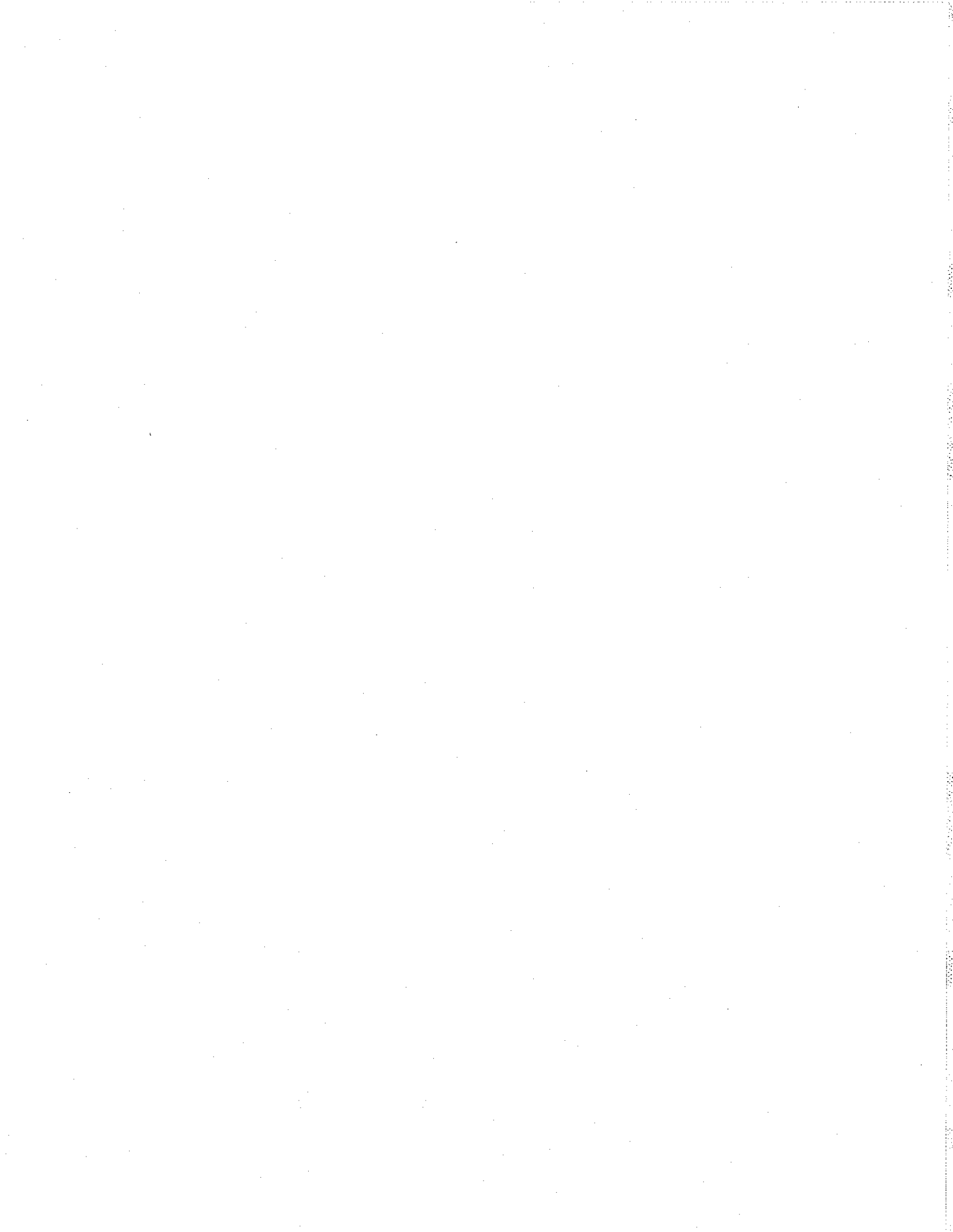
Information on large truck traffic fatalities is available from the National Center for Statistics and Analysis, NPO-121, 400 Seventh Street, S.W., Washington, D.C. 20590. NCSA information can also be obtained by telephone or by fax-on-demand at 1-800-934-8517. FAX messages should be sent to (202) 366-7078. General information on highway traffic safety can be accessed by Internet users at <http://www.nrd.nhtsa.dot.gov/people/ncsa>. To report a safety-related problem or to inquire about motor vehicle safety information, contact the Auto Safety Hotline at 1-800-424-9393.

Other fact sheets available from the National Center for Statistics and Analysis are *Overview, Alcohol, Occupant Protection, Older Population, Speeding, Young Drivers, Children, Pedestrians, Pedalcyclists, Motorcycles, School Transportation-Related Crashes, State Traffic Data, and State Alcohol Estimates*. Detailed data on motor vehicle traffic crashes are published annually in *Traffic Safety Facts: A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Reporting System and the General Estimates System*.

Table 4. Large Truck Involvement in Fatal Crashes by State, 2002

State	Total Vehicles Involved in Fatal Crashes	Large Trucks Involved in Fatal Crashes		
		Number	Percentage of Total Vehicles	Percentage of U.S. Total for Large Trucks
Alabama	1,358	122	9.0	2.7
Alaska	111	4	3.6	0.1
Arizona	1,475	88	6.0	1.9
Arkansas	815	78	9.6	1.7
California	5,544	346	6.2	7.6
Colorado	975	50	5.1	1.1
Connecticut	416	17	4.1	0.4
Delaware	177	17	9.6	0.4
District of Columbia	73	0	0.0	0.0
Florida	4,431	351	7.9	7.7
Georgia	2,188	202	9.2	4.4
Hawaii	168	4	2.4	0.1
Idaho	353	30	8.5	0.7
Illinois	1,926	159	8.3	3.5
Indiana	1,157	120	10.4	2.6
Iowa	596	67	11.2	1.5
Kansas	685	78	11.4	1.7
Kentucky	1,224	114	9.3	2.5
Louisiana	1,173	102	8.7	2.2
Maine	272	21	7.7	0.5
Maryland	963	61	6.3	1.3
Massachusetts	626	22	3.5	0.5
Michigan	1,856	123	6.6	2.7
Minnesota	892	78	8.7	1.7
Mississippi	1,106	72	6.5	1.6
Missouri	1,650	151	9.2	3.3
Montana	309	22	7.1	0.5
Nebraska	413	59	14.3	1.3
Nevada	515	33	6.4	0.7
New Hampshire	184	15	8.2	0.3
New Jersey	1,025	48	4.7	1.1
New Mexico	571	57	10.0	1.3
New York	2,066	131	6.3	2.9
North Carolina	2,147	166	7.7	3.7
North Dakota	125	18	14.4	0.4
Ohio	2,000	186	9.3	4.1
Oklahoma	975	107	11.0	2.4
Oregon	557	45	8.1	1.0
Pennsylvania	2,198	174	7.9	3.8
Rhode Island	118	5	4.2	0.1
South Carolina	1,379	91	6.6	2.0
South Dakota	218	16	7.3	0.4
Tennessee	1,559	129	8.3	2.8
Texas	5,039	401	8.0	8.8
Utah	394	38	9.6	0.8
Vermont	109	10	9.2	0.2
Virginia	1,220	84	6.9	1.8
Washington	866	53	6.1	1.2
West Virginia	578	57	9.9	1.3
Wisconsin	1,135	93	8.2	2.0
Wyoming	203	27	13.3	0.6
U.S. Total	58,113	4,542	7.8	100.0
Puerto Rico	657	36	5.5	—

Note: Totals may not equal sum of components due to independent rounding.



Injuries and Fatalities

NATIONAL (2001)

Injuries (including both minor and major, i.e. with and without lost work days)

Industry: Heavy construction, except building, except highway
Rate: 7.7 total injuries per 200,000 work hours or 0.0000385 injuries per working hour
Rate: 2.8 lost work days injuries per 200,000 work hours or 0.000014 injuries per working hour
Rate: 3.9 lost work days and restricted activity injuries per 200,000 work hours or 0.0000195 injuries per working hour
Rate: 3.8 injuries without lost work days per 200,000 hours or 0.000019 injuries per working hour

Fatalities (obtained from BLS)

Industry: Construction 38.5
Rate: 11.7 fatalities per 100,000 employees or 0.000117 fatalities per employee
Rate⁽¹⁾: 11.7 fatalities per 200,000,000 working hours or 5.85 x 10⁻⁸ fatalities per hour

(1) assuming 100,000 employees are full time working 40 hours a week, 50 weeks a year

FLORIDA (2001 Data)

Injuries (including both minor and major, i.e. with and without lost work days)

Industry: Heavy construction, except building, except highway
Rate: 8.8 total injuries per 200,000 work hours or 0.000044 injuries per working hour
Rate: 3.0 lost work days injuries per 200,000 work hours or 0.000015 injuries per working hour
Rate: 3.9 lost work days and restricted activity injuries per 200,000 work hours or 0.0000195 injuries per working hour
Rate: 3.9 injuries without lost work days per 200,000 hours or 0.0000195 injuries per working hour



TABLE 1. Incidence rates¹ of nonfatal occupational injuries and illnesses by industry and selected case types, 2001

Industry ²	SIC code ³	Injuries and illnesses				Injuries			
		Total cases	Lost workday cases		Cases without lost work-days	Total cases	Lost workday cases		Cases without lost work-days
			Total ⁴	With days away from work ⁵			Total ⁴	With days away from work ⁵	
Private industry⁶		5.7	2.8	1.7	2.9	5.4	2.6	1.6	2.7
Agriculture, forestry, and fishing⁶		7.3	3.6	2.7	3.7	7.0	3.6	2.6	3.4
Agricultural production ⁶	01-02	7.6	3.7	2.5	4.0	7.3	3.6	2.4	3.7
Agricultural production—crops ⁶	01	7.0	3.4	2.2	3.6	6.7	3.3	2.2	3.3
Cash grains ⁶	011	4.8	2.9	1.4	1.9	4.7	2.8	1.4	1.9
Field crops, except cash grains ⁶	013	5.7	2.0	1.2	3.7	5.3	1.9	1.1	3.4
Vegetables and melons ⁶	016	5.2	2.6	1.8	2.6	4.9	2.5	1.8	2.4
Fruits and tree nuts ⁶	017	6.1	2.7	2.1	3.4	5.6	2.7	2.0	2.9
Horticultural specialties ⁶	018	9.3	4.7	2.6	4.6	8.9	4.6	2.6	4.3
General farms, primarily crop ⁶	019	5.3	3.0	2.8	2.4	5.3	2.9	2.8	2.4
Agricultural production—livestock ⁶	02	9.2	4.4	3.2	4.9	9.0	4.3	3.1	4.7
Livestock, except dairy and poultry ⁶	021	12.5	5.1	3.9	7.3	12.2	5.0	3.9	7.1
Dairy farms ⁶	024	6.2	3.2	2.9	3.0	6.1	3.2	2.8	2.9
Poultry and eggs ⁶	025	8.7	5.1	2.5	3.6	8.3	4.9	2.4	3.4
Animal specialties ⁶	027	11.9	3.2	2.5	8.7	11.4	3.0	2.3	8.4
Agricultural services	07	7.1	3.6	2.8	3.5	6.8	3.6	2.8	3.3
Crop services	072	9.1	5.4	3.5	3.7	8.8	5.3	3.4	3.5
Veterinary services	074	7.6	2.1	1.7	5.5	7.3	2.1	1.6	5.2
Animal services, except veterinary	075	6.8	3.6	2.9	3.2	6.5	3.6	2.9	2.9
Farm labor and management services	076	5.6	3.5	3.0	2.1	5.5	3.4	3.0	2.1
Landscape and horticultural services	078	7.0	3.8	3.0	3.2	6.6	3.8	2.9	2.9
Forestry	08	6.4	3.3	2.6	3.1	6.0	3.2	2.5	2.8
Timber tracts	081	4.7	1.6	.8	3.1	4.7	1.6	.8	3.1
Forestry services	085	7.7	4.6	3.8	3.2	7.1	4.4	3.7	2.7
Fishing, hunting, and trapping	09	3.9	2.8	2.4	1.1	3.5	2.4	2.0	1.1
Mining⁷		4.0	2.4	1.8	1.6	3.9	2.3	1.7	1.5
Metal mining ⁸	10	4.2	2.4	1.3	1.9	3.9	2.2	1.2	1.7
Iron ores ⁸	101	5.6	2.8	2.1	2.8	4.9	2.6	1.8	2.4
Copper ores ⁸	102	2.3	1.2	.7	1.1	2.3	1.2	.7	1.1
Lead and zinc ores ⁸	103	6.5	3.5	2.9	3.0	5.6	3.1	2.5	2.6
Gold and silver ores ⁸	104	4.0	2.4	.9	1.7	3.7	2.2	.8	1.6
Ferroalloy ores, except vanadium ⁸	106	3.2	1.6	.7	1.6	3.2	1.6	.7	1.6
Miscellaneous metal ores ⁸	109	6.7	4.2	2.4	2.5	6.4	4.0	2.2	2.4
Coal mining ⁸	12	6.9	4.9	4.5	2.0	6.4	4.6	4.3	1.7
Bituminous coal and lignite mining ⁸	122	6.9	4.9	4.5	2.0	6.4	4.6	4.3	1.7
Anthracite mining ⁸	123	6.0	4.3	3.7	1.7	5.7	4.2	3.6	1.5
Oil and gas extraction	13	3.3	1.7	1.2	1.6	3.2	1.7	1.2	1.6
Crude petroleum and natural gas	131	2.5	1.1	.9	1.4	2.4	1.0	.9	1.4
Oil and gas field services	138	3.8	2.1	1.4	1.7	3.7	2.1	1.3	1.7
Nonmetallic minerals, except fuels ⁸	14	4.2	2.8	1.7	1.4	4.0	2.7	1.6	1.4
Dimension stone ⁸	141	6.0	4.6	3.5	1.4	6.0	4.6	3.5	1.4
Crushed and broken stone ⁸	142	4.3	2.8	1.6	1.5	4.2	2.7	1.6	1.5
Sand and gravel ⁸	144	3.6	2.3	1.5	1.3	3.5	2.3	1.5	1.2
Clay, ceramic, and refractory minerals ⁸	145	3.8	2.5	1.5	1.3	3.6	2.4	1.4	1.2
Chemical and fertilizer minerals ⁸	147	4.4	3.1	1.7	1.3	4.1	2.9	1.5	1.2
Miscellaneous nonmetallic minerals ⁸	149	5.4	3.4	2.4	2.0	5.1	3.2	2.2	1.9
Construction		7.9	4.0	3.0	3.9	7.8	3.9	3.0	3.9
General building contractors	15	6.9	3.5	2.6	3.5	6.8	3.4	2.5	3.4
Residential building construction	152	6.5	3.5	2.8	2.9	6.4	3.5	2.7	2.9
Operative builders	153	3.5	1.4	1.1	2.1	3.5	1.4	1.1	2.1
Nonresidential building construction	154	7.6	3.5	2.5	4.1	7.5	3.4	2.4	4.1
Heavy construction, except building	16	7.8	4.0	2.9	3.8	7.6	4.0	2.9	3.7

See footnotes at end of table.

TABLE 1. Incidence rates¹ of nonfatal occupational injuries and illnesses by industry and selected case types, 2001—
Continued

Industry ²	SIC code ³	Injuries and illnesses				Injuries			
		Total cases	Lost workday cases		Cases without lost work-days	Total cases	Lost workday cases		Cases without lost work-days
			Total ⁴	With days away from work ⁵			Total ⁴	With days away from work ⁵	
Highway and street construction	161	7.7	4.2	3.1	3.5	7.6	4.1	3.1	3.5
Heavy construction, except highway	162	7.8	4.0	2.8	3.9	7.7	3.9	2.8	3.8
Special trade contractors	17	8.2	4.1	3.2	4.1	8.1	4.0	3.2	4.1
Plumbing, heating, air-conditioning	171	9.7	4.6	3.4	5.1	9.6	4.5	3.3	5.0
Electrical work	173	6.9	2.9	2.3	3.9	6.8	2.9	2.3	3.9
Masonry, stonework, and plastering	174	9.7	5.2	4.2	4.5	9.6	5.1	4.1	4.4
Carpentry and floor work	175	9.8	4.9	4.2	4.9	9.7	4.9	4.1	4.9
Roofing, siding, and sheet metal work	176	9.1	5.0	4.1	4.1	8.9	4.9	4.0	4.0
Concrete work	177	7.8	4.1	3.2	3.7	7.8	4.1	3.2	3.6
Water well drilling	178	8.0	5.6	4.8	2.4	8.0	5.6	4.8	2.4
Miscellaneous special trade contractors	179	7.2	3.8	3.0	3.3	7.1	3.8	3.0	3.3
Manufacturing		8.1	4.1	1.8	4.0	7.0	3.6	1.7	3.4
Durable goods		8.8	4.3	2.0	4.6	7.7	3.7	1.8	3.9
Lumber and wood products	24	10.6	5.5	3.0	5.1	10.1	5.3	2.9	4.9
Logging	241	6.5	3.5	3.3	3.1	6.4	3.4	3.2	3.0
Sawmills and planing mills	242	10.8	5.9	3.2	4.9	10.2	5.6	3.2	4.6
Sawmills and planing mills, general	2421	10.4	6.0	3.4	4.4	9.9	5.8	3.4	4.1
Hardwood dimension and flooring mills	2426	11.8	5.3	2.2	6.5	10.9	4.9	2.1	6.0
Millwork, plywood and structural members	243	10.8	5.6	2.9	5.2	10.2	5.3	2.7	4.9
Millwork	2431	12.1	6.3	2.9	5.9	11.2	5.8	2.7	5.4
Wood kitchen cabinets	2434	9.1	5.0	2.6	4.1	8.7	4.7	2.6	3.9
Hardwood veneer and plywood	2435	7.3	3.8	2.2	3.5	6.7	3.5	2.1	3.2
Softwood veneer and plywood	2436	6.3	3.3	1.5	3.0	6.0	3.2	1.4	2.8
Structural wood members, n.e.c.	2439	15.7	7.7	4.6	7.9	15.4	7.6	4.5	7.8
Wood containers	244	8.6	5.1	3.5	3.5	8.5	5.0	3.5	3.4
Wood pallets and skids	2448	8.1	5.2	3.6	2.9	8.0	5.1	3.5	2.9
Wood buildings and mobile homes	245	16.3	7.8	3.0	8.6	16.1	7.6	2.9	8.4
Mobile homes	2451	15.0	7.2	2.1	7.8	14.7	7.0	2.1	7.7
Prefabricated wood buildings	2452	19.1	9.0	4.8	10.1	19.0	9.0	4.8	10.1
Miscellaneous wood products	249	8.6	3.9	2.3	4.7	8.0	3.6	2.2	4.3
Wood preserving	2491	10.1	3.8	2.0	6.3	9.5	3.5	1.9	6.0
Reconstituted wood products	2493	4.9	2.2	1.2	2.7	4.7	2.2	1.2	2.5
Wood products, n.e.c.	2499	9.9	4.7	2.9	5.1	9.1	4.4	2.8	4.7
Furniture and fixtures	25	11.0	5.7	2.4	5.3	10.0	5.1	2.2	4.8
Household furniture	251	11.1	5.7	2.6	5.4	10.1	5.2	2.3	4.9
Wood household furniture	2511	10.3	5.0	2.4	5.4	9.2	4.5	2.1	4.7
Upholstered household furniture	2512	10.2	5.4	2.1	4.8	9.2	4.8	1.8	4.3
Metal household furniture	2514	12.7	6.5	2.5	6.2	11.6	6.2	2.4	5.4
Mattresses and bedspings	2515	14.7	8.4	4.2	6.4	14.4	8.1	4.0	6.2
Office furniture	252	10.0	5.1	1.9	4.9	8.9	4.3	1.7	4.6
Wood office furniture	2521	9.6	3.8	1.9	5.8	8.9	3.3	1.6	5.6
Office furniture, except wood	2522	10.4	6.2	1.9	4.2	8.9	5.1	1.7	3.8
Public building and related furniture	253	14.4	8.7	2.6	5.7	11.9	7.1	2.2	4.8
Partitions and fixtures	254	10.5	5.4	2.8	5.1	10.1	5.1	2.7	5.0
Wood partitions and fixtures	2541	10.4	5.6	3.2	4.8	10.2	5.5	3.1	4.7
Partitions and fixtures, except wood	2542	10.6	5.0	2.3	5.6	9.9	4.5	2.0	5.4
Miscellaneous furniture and fixtures	259	9.0	4.0	1.7	5.0	8.2	3.7	1.5	4.5
Drapery hardware and blinds and shades	2591	7.5	2.7	1.1	4.8	6.7	2.5	1.0	4.2
Furniture and fixtures, n.e.c.	2599	11.2	5.9	2.6	5.3	10.3	5.4	2.3	4.9
Stone, clay, and glass products	32	10.1	5.1	2.8	5.0	9.6	4.9	2.7	4.7
Flat glass	321	12.3	4.0	1.1	8.3	11.0	3.6	1.0	7.4
Glass and glassware, pressed or blown	322	9.2	4.6	2.5	4.6	8.6	4.2	2.3	4.4
Glass containers	3221	9.7	4.9	1.9	4.8	9.3	4.7	1.8	4.6

See footnotes at end of table.

Kim, Jeffrey

From: Drudi, Dino - BLS [Drudi.Dino@bls.gov]
Sent: Wednesday, December 01, 2004 2:00 PM
To: Kim, Jeffrey
Cc: CFOIINFO
Subject: Fatality Rates for Excavation

Thank you for contacting the Bureau of Labor Statistics Census of Fatal Occupational Injuries. As I explained in our telecom, fatal injury rates are based on Current Population Survey, a measure of number of workers employed not hours worked. In this respect rates for fatal and nonfatal injuries differ. For 2003, the first year BLS introduced the North American Industry Classification System for fatal injuries, construction had an overall rate of 11.7 fatal injuries per 100,000 employed workers. Rates are not available for more detailed subcategories of construction such as excavation work.

Dino Drudi
202--691-6175



Table 6. Incidence rates¹ of nonfatal occupational injuries and illnesses by industry and selected case types, 2001

Florida

Industry ²	SIC code ³	Injuries and Illnesses				Injuries			
		Total cases	Lost workday cases		Cases without lost work-days	Total cases	Lost workday cases		Cases without lost work-days
			Total ⁴	With days away from work ⁵			Total ⁴	With days away from work ⁵	
Private Industry⁶		5.7	2.7	1.5	3.0	5.5	2.6	1.5	2.9
Agriculture, forestry, and fishing⁶		7.0	3.4	2.4	3.6	6.6	3.3	2.3	3.3
Agricultural production ⁶	01-02	7.3	4.0	2.6	3.3	6.7	3.9	2.6	2.8
Agricultural production-crops ⁶	01	6.9	3.8	2.5	3.1	6.2	3.7	2.4	2.5
Vegetables and melons ⁶	016	4.8	2.7	1.9	2.0	4.5	2.7	1.9	1.8
Fruits and tree nuts ⁶	017	9.5	3.8	2.8	5.6	8.5	3.8	2.8	4.7
Horticultural specialties ⁶	018	7.5	4.3	2.7	3.2	6.4	4.1	2.6	2.4
Agricultural production - livestock ⁶	02	11.8	6.1	4.4	5.7	11.6	6.1	4.4	5.5
Agricultural services	07	6.9	3.1	2.3	3.8	6.7	3.0	2.2	3.7
Farm labor and management services	076	7.6	3.4	3.0	4.3	7.4	3.3	2.9	4.1
Landscape and horticultural services	078	5.5	2.6	1.8	2.9	5.4	2.6	1.8	2.8
Mining⁷		2.9	2.1	0.9	0.8	2.8	2.1	0.8	0.7
Nonmetallic minerals, except fuels ⁸	14	3.1	2.3	0.9	0.8	3.0	2.3	0.9	0.7
Construction		7.8	3.8	2.8	4.0	7.7	3.8	2.8	3.9
General building contractors	15	8.1	3.6	2.6	4.6	8.0	3.5	2.5	4.5
Residential building construction	152	9.0	4.0	3.0	5.0	9.0	4.0	--	5.0
Nonresidential building construction	154	6.7	3.0	2.1	3.7	6.4	2.8	1.9	3.6
Heavy construction, except building	16	8.6	4.8	3.0	3.8	8.5	4.8	3.0	3.7
Heavy construction, except highway	162	8.9	4.9	3.0	4.0	8.8	4.9	3.0	3.9
Special trade contractors	17	7.5	3.7	2.8	3.8	7.4	3.7	2.8	3.7
Plumbing, heating, air-conditioning	171	6.7	2.9	1.7	3.7	6.6	2.9	1.7	3.7
Electrical work	173	8.9	4.1	3.4	4.8	8.9	4.0	3.3	4.8
Masonry, stonework, and plastering	174	5.5	3.2	2.4	2.4	5.5	3.2	2.4	2.3
Carpentry and floor work	175	8.4	4.9	4.6	3.5	8.4	4.9	4.6	3.5
Roofing, siding, and sheet metal work	176	9.5	6.3	4.3	3.2	8.5	5.8	3.9	2.7
Concrete work	177	10.6	5.1	3.7	5.5	10.4	5.1	3.7	5.3
Miscellaneous special trade contractors	179	6.8	2.9	2.5	3.8	6.7	2.9	2.5	3.7
Manufacturing		7.1	3.6	1.6	3.5	6.7	3.4	1.6	3.3
Durable goods		7.5	3.6	1.7	3.9	7.1	3.4	1.6	3.7
Lumber and wood products	24	11.3	6.8	3.8	4.6	11.2	6.8	3.8	4.5
Millwork, plywood and structural members	243	11.8	6.9	4.7	4.9	11.6	6.9	4.7	4.7
Structural wood members, n.e.c.	2439	15.5	7.5	4.4	8.0	15.3	7.5	4.4	7.7
Furniture and fixtures	25	8.8	4.9	2.7	3.9	8.7	4.8	2.6	3.9
Household furniture	251	10.4	6.5	3.5	3.9	--	6.4	3.4	3.8
Stone, clay, and glass products	32	10.0	5.5	2.1	4.5	9.9	5.5	2.1	4.4
Concrete, gypsum, and plaster products	327	11.2	6.4	2.6	4.8	11.1	6.4	2.6	4.8
Concrete products, n.e.c.	3272	14.6	8.6	3.3	6.0	14.4	8.6	3.3	5.9
Ready-mixed concrete	3273	10.4	5.0	1.5	5.3	10.4	5.0	1.5	5.3
Primary metal industries	33	6.2	3.5	1.7	2.7	6.1	3.5	1.7	2.6
Fabricated metal products	34	9.8	3.9	1.9	5.9	9.4	3.8	1.9	5.6
Fabricated structural metal products	344	11.9	5.3	2.5	6.7	11.8	5.2	2.5	6.6
Metal doors, sash, and trim	3442	15.3	6.1	2.1	--	15.3	6.1	2.1	--
Sheet metal work	3444	9.9	2.9	1.5	7.0	9.9	2.9	1.5	7.0
Miscellaneous fabricated metal products	349	6.3	1.6	1.0	4.7	5.3	1.3	0.8	4.0

See footnotes at end of table.

APPENDIX C

ESTIMATED PROJECT MAN-HOURS TREATMENT AND
DISPOSAL ALTERNATIVES
CABOT CARBON/KOPPERS SUPERFUND SITE

APPENDIX C

ESTIMATED PROJECT MAN-HOURS TREATMENT AND DISPOSAL ALTERNATIVES CABOT CARBON/KOPPERS SUPERFUND SITE

PURPOSE

This appendix has been prepared to provide and estimate the number of construction man-hours that would be required to complete the Cabot Carbon/Koppers Superfund Site source removal Interim Remedial Measure project. These estimates provide a basis for estimating the risk of accidents and fatalities that could result from implementation of the alternatives.

METHODOLOGY

The estimates contained in this appendix are based on Alternative 2: excavation, with direct disposal in an onsite RCRA landfill. This is the simplest alternative to implement, as it requires the minimum amount of handling for the excavated soils. Other alternatives and testing could require twice the level of effort for handling (although the level of effort for excavation is the same for all alternatives).

Activities contained in this estimate are taken from the Project Schedule included in this report as Figure 5.3. The list of Tasks in Table C.1 of this appendix have been expanded due to various sub-tasks which require a different crew, equipment, or activity that is operating for only a portion of the main Task. Added to the table are overhead items that are generally not shown in project schedules, such as Project Management and CQA activities.

CALCULATIONS

Excavator-Trucks

For the purposes of this appendix, production rate for the various excavation and disposal activities is 2,500 tons per day (i.e. 1,563 cubic yards per day) although the total construction man-hours is relatively insensitive to production rate. The production rates and equipment were developed in consultation with an experienced construction contractor who has worked in the

environmental remediation business for many years (Sevenson Environmental Services of Pittsburg, Pennsylvania). Sevenson reviewed the project, considered implementation constraints and developed workable approach to complete the project.

Using the construction schedule, expected daily production rates, and equipment capacities, it is clear that a one-excavator and two-truck fleet can provide the necessary production. This fleet size was used to calculate operator-hours for all excavation and disposal tasks. These rates are reflected in the Table C.1. Actual number of hours operating equipment are estimated to establish employee levels required onsite during the task, not to reflect the number of units.

GEOSYNTHETIC INSTALLATION

TRC experience in liner construction indicates that most geosynthetic liner systems can be deployed and tested at a rate of 1 acre per day using a ten-man crew. There are six layers of geosynthetics in the liner system and three layers in the cover system. Using the onsite landfill area of approximately 10 acres for the liner and cover systems results in time requirements for installation of 60 days for the six-layer bottom liner and 30 days for the three-layer cover.

All other equipment requirements and employee loading numbers are estimated by Task and are based on TRC construction experience. The number of days required for sub-tasks are estimated in the same manner. In those cases without sub-tasks, the Project Schedule task duration rates determine the number of days a particular group of employees are onsite. No estimating contingency has been added to the results of the calculations.

To obtain the mechanical maintenance employees onsite, a ratio of 1 mechanic hour for each 9 equipment operator man-hours is used.

See Table C.1 for the results of the calculations of total man-hours. The total is 112,280 man-hours.

APPENDIX D

COST ESTIMATE DETAILS AND BACKUP CALCULATIONS

**Appendix D
Cost Estimate
Summary of Costs**

Task	Alt 1	Alt 2	Alt 3	Alt 4
Description	Off-Site Incineration	On-Site Landfill	Use thermally-treated soil to backfill excavations	Off-site landfill disposal
Demolition	\$ 160,600	\$ 160,600	\$ 160,600	\$ 160,600
Excavation	\$ 16,968,925	\$ 16,662,431	\$ 7,813,988	\$ 16,968,925
On-site Treatment of Soil	\$ 126,305	\$ -	\$ 59,286,430	\$ 126,305
On-site Landfill	\$ -	\$ 5,267,804	\$ -	\$ -
Lined Excavation Bottoms Backfill	\$ -	\$ -	\$ 3,150,934	\$ -
Off-site Treatment/Disposal	\$ 441,720,600	\$ -	\$ -	\$ 188,879,424
Site Restoration	\$ 1,426,580	\$ 1,392,920	\$ 1,193,000	\$ 1,426,580
O+M	\$ -	\$ -	\$ -	\$ -
Miscellaneous⁽¹⁾	\$ 39,134,256	\$ 11,976,715	\$ 36,518,525	\$ 17,642,756
Total	\$ 499,537,266	\$ 35,460,470	\$ 108,123,477	\$ 225,204,590

(1) Includes permitting, engineering, construction management, QA/QC, sampling and analytical, contingency, etc.

Appendix D
Cost Estimate Detail
Alternative 1

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
1	Demolition	Demolish Buildings	7,800	sf	\$4.25	\$33,150	\$160,600
		Demolish Paving	15,300	sf	\$3.00	\$45,900	
		Demolish/Recycle Rail Road Tracks		lf	\$0.00	\$0	
		Locate Utilities Geophysical	1	ls	\$8,000.00	\$8,000	
		Remove/Relocate Utilities	1	A lot	\$25,000.00	\$25,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Clear and Grub Treed Areas	1.30	Acre	\$3,500.00	\$4,550	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Remove Wood Fired Boiler	1	ls	\$40,000.00	\$40,000	
		Demolish Fence	400	lf	\$10.00	\$4,000	
					\$0.00	\$0	
2	Excavation	Install Dewatering Trench Bio Slurry Type	128,900	sf	\$15.50	\$1,997,950	\$16,968,925
		Install Dewatering Piping System	5,850	lf	\$26.75	\$156,488	
		Install Dewatering Sumps and Pumps (Every 200 lf)	28.00	ea	\$7,500.00	\$210,000	
		Install Dewatering Treatment System	1	ls	\$1,200,000.00	\$1,200,000	
		Operate Dewatering System	22,500,000	gal	\$0.015	\$337,500	
		Install/Later Remove Silt Fence	5,350	lf	\$5.00	\$26,750	
		Install/Remove Shoring	17,940	sf	\$32.50	\$583,050	
		Decontamination Pad	1	ls	\$35,000.00	\$35,000	
		Excavate Soil (Covers Direct Load of Trucks Option)	441,000	cy	\$4.50	\$1,984,500	
		Transport Soil to Stockpile	441,000	cy	\$2.75	\$1,212,750	
		Transport Soil to Site Landfill or Lined Excav., place and compact		cy	\$4.85	\$0	
		Import Soil to Fill in Excavations	441,000	cy	\$18.00	\$7,938,000	
		Place and Compact Soil	441,000	cy	\$2.85	\$1,256,850	
		Reseed Excavated Areas If Not Used as Cell	17.19	acre	\$1,750.00	\$30,087	
					\$0.00	\$0	
3	On-site Treatment of Soil	Tons per Cubic Yard		ton	1.60	\$0	\$126,305
		Lined Stockpile/Treatment Area with Elevated Berm/Barrier	175,424	sf	\$0.72	\$126,305	
		Stabilize Soil On-site	-	ton	\$25.00	\$0	
		Pre-Treatment Processing	-	ton	\$0.00	\$0	
		Thermal Treat Soil On-site	-	ton	\$75.00	\$0	
		Load, Transport and Compact Treated Soil On-Site	-	cy	\$7.25	\$0	
		Load, Transport and Load for Off-site Disposal	-	cy	\$10.10	\$0	
		Pre/Post Treatment Sampling	-	samp	\$250.00	\$0	
		On-site Incineration with Mob/Demob Allocation	-	ton	\$2,000.00	\$0	
					0%	\$0	
4	On-site Landfill	CELL					\$0
		Install Replacement Storm water Control Ditch		cy	\$7.15	\$0	
		Excavate, Transport and Stockpile Bottom Foundation of Landfill		cy	\$4.00	\$0	
		Import Soil for Containment Berms		cy	\$18.00	\$0	
		Place and Compact Containment Berms		cy	\$2.85	\$0	
		Grade Bottom Before Lining		sf	\$0.35	\$0	
		Anchor Trench		lf	\$2.73	\$0	
		Install GCL (Sump)		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides (Sump)		sf	\$0.60	\$0	
		Install 16 oz. Geotextile (Sump)		sf	\$0.31	\$0	
		Install Drain Rock (Sump)		ton	\$22.50	\$0	
		Install 4" PVC Sump Pipe (Sump)		lf	\$4.00	\$0	
		Install Geotextile 16 oz (Sump)		sf	\$0.31	\$0	
		Install GCL		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 6" Corrugated Perforated HDPE Pipe Drain		lf	\$13.00	\$0	
		Install 4" Corrugated Perforated HDPE Pipe Drain		lf	\$10.00	\$0	
		Install Drain Rock		ton	\$22.50	\$0	
		Install 8 oz Geotextile		sf	\$0.20	\$0	
		CAP		0	\$0.00	\$0	
		Import Structural Wedge Soil		cy	\$18.00	\$0	
		Place and Compact Structural Wedge Soil		cy	\$2.85	\$0	
		Anchor Trench		lf	\$2.73	\$0	
		Install GCL		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 8 oz Geotextile CAP Drain		sf	\$0.20	\$0	
		Install 4" Corrugated Perforated HDPE Pipe Drain		lf	\$10.00	\$0	
		Install Drain Rock for Perimeter CAP Drain		ton	\$22.50	\$0	
		Import Vegetative Cover		cy	\$30.00	\$0	
		Place Vegetative Cover		cy	\$1.85	\$0	
		Seed Cap		acre	\$1,750.00	\$0	
Additional Sampling for Leaving Soil On-site		ea	\$0.00	\$0			
			\$0.00	\$0			

Appendix D
Cost Estimate Detail
Alternative 1

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
5	Lined Excavation/Backfill	CELL			\$0.00	\$0	
		Grade Bottom Before Lining		sf	\$0.35	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install 16 oz. Geotextile		sf	\$0.31	\$0	
		Install Drain Rock		ton	\$22.50	\$0	
		Install 8 oz Geotextile		sf	\$0.20	\$0	
		CAP			\$0.00	\$0	
		Sump with Pump 30' Deep		ea	\$6,450.00	\$0	
		Import Soil		cy	\$18.00	\$0	
		Place and Compact Import Cover Soil		cy	\$2.85	\$0	
		Seed Cap		acre	\$1,750.00	\$0	
		Additional Sampling for Leaving Soil On-sit		ea	\$0.00	\$0	\$0
6	Off-site Treatment/Disposal	Tons per Cubic Yard		ton	1.60	\$0	
		Load, Transport and Incinerate Soil Off-site (Trucks)	352,800	ton	\$704.33	\$248,487,624	
		Load, Transport and Dispose at Subtitle "C" (Trucks)	-	ton	\$286.33	\$0	
		Load, Transport and Incinerate Soil Off-site (Rail)	352,800	ton	\$547.67	\$193,217,976	
		Load, Transport and Dispose at Subtitle "C" (Rail)	-	ton	\$249.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Transloading Facility	1	ls	\$15,000.00	\$15,000	
		Import Soil to Replace Removed Contaminated Soil		cy	\$18.00	\$0	
		Place and Compact Soil in Removal Location:	-	cy	\$2.85	\$0	\$441,720,600
7	Site Restoration	Install Railroad Tracks 100 lb Rail, Wood Ties	2,290	lf	\$102.00	\$233,580	
		Install Tram		ls	\$0.00	\$0	
		Reinstall Fence	400	lf	\$13.00	\$5,200	
		Reinstall Asphalt/Concrete	15,300	sf	\$6.00	\$91,800	
		Building	7,800	sf	\$70.00	\$546,000	
		Gas Fired Boiler	1	ls	\$550,000.00	\$550,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	\$1,426,580
		Subtotal:					\$460,403,010
	Miscellaneous	Engineering (Including Field Investigations)	1.33%			\$6,138,707	
		Local Permitting	0.83%			\$3,836,692	
		Plan Checks	0.00%			\$0	
		Construction Management/Project Management	1.33%			\$6,138,707	
		QA/QC	0.83%			\$3,836,692	
		Contingency	2.50%			\$11,510,075	
		Fee	1.67%			\$7,673,384	\$39,134,256
							Total: \$499,537,266

Appendix D
Cost Estimate Detail
Alternative 2

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
1	Demolition	Demolish Buildings	7,800	sf	\$4.25	\$33,150	\$160,600
		Demolish Paving	15,300	sf	\$3.00	\$45,900	
		Demolish/Recycle Rail Road Tracks	1,000	lf	\$0.00	\$0	
		Locate Utilities Geophysical	1	ls	\$8,000.00	\$8,000	
		Remove/Relocate Utilities	1	A lot	\$25,000.00	\$25,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Clear and Grub Treed Areas	1.30	Acre	\$3,500.00	\$4,550	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Remove Wood Fired Boiler	1	ls	\$40,000.00	\$40,000	
		Demolish Fence	400	lf	\$10.00	\$4,000	
					\$0.00	\$0	
2	Excavation	Install Dewatering Trench Bio Slurry Type	128,900	sf	\$15.50	\$1,997,950	\$166,624.31
		Install Dewatering Piping System	5,850	lf	\$26.75	\$156,488	
		Install Dewatering Sumps and Pumps (Every 200 lf)	28.00	ea	\$7,500.00	\$210,000	
		Install Dewatering Treatment System	1	ls	\$1,200,000.00	\$1,200,000	
		Operate Dewatering System	22,500,000	gal	\$0.015	\$337,500	
		Install/Later Remove Silt Fence	5,350	lf	\$5.00	\$26,750	
		Install/Remove Shoring	17,940	sf	\$32.50	\$583,050	
		Decontamination Pad	3	ls	\$35,000.00	\$105,000	
		Excavate Soil (Covers Direct Load of Trucks Option)	441,000	cy	\$4.50	\$1,984,500	
		Transport Soil to Stockpile	110,250	cy	\$2.75	\$303,188	
		Transport Soil to Site Landfill or Lined Excav., place and compact	110,250	cy	\$4.85	\$534,713	
		Import Soil to Fill in Excavations	441,000	cy	\$18.00	\$7,938,000	
		Place and Compact Soil	441,000	cy	\$2.85	\$1,256,850	
		Reseed Excavated Areas If Not Used as Cell	16.25	acre	\$1,750.00	\$28,444	
					\$0.00	\$0	
3	On-site Treatment of Soil	Tons per Cubic Yard		ton	1.60	\$0	\$0
		Lined Stockpile/Treatment Area with Elevated Berm/Barrier		sf	\$0.72	\$0	
		Stabilize Soil On-site	-	ton	\$25.00	\$0	
		Pre-Treatment Processing	-	ton	\$0.00	\$0	
		Thermal Treat Soil On-site	-	ton	\$75.00	\$0	
		Load, Transport and Compact Treated Soil On-Site	-	cy	\$7.25	\$0	
		Load, Transport and Load for Off-site Disposal	-	cy	\$10.10	\$0	
		Pre/Post Treatment Sampling	-	samp	\$250.00	\$0	
		On-site Incineration with Mob/Demob Allocation	-	ton	\$2,000.00	\$0	
					0%	\$0	
		4	On-site Landfill	CELL			
Install Replacement Storm water Control Ditch	2,204			cy	\$7.15	\$15,759	
Excavate, Transport and Stockpile Bottom Foundation of Landfill	17,508			cy	\$4.00	\$70,032	
Import Soil for Containment Berms	54,484			cy	\$18.00	\$980,708	
Place and Compact Containment Berms	54,484			cy	\$2.85	\$155,279	
Grade Bottom Before Lining	472,717			sf	\$0.35	\$165,451	
Anchor Trench	3,015			lf	\$2.73	\$8,231	
Install GCL (Sump)	13,720			sf	\$0.68	\$9,329	
Install 60 mil HDPE Liner Textured Both Sides (Sump)	13,720			sf	\$0.60	\$8,232	
Install 16 oz. Geotextile (Sump)	13,720			sf	\$0.31	\$4,253	
Install Drain Rock (Sump)	504			ton	\$22.50	\$11,339	
Install 4" PVC Sump Pipe (Sump)	1,193			lf	\$4.00	\$4,772	
Install Geotextile 16 oz (Sump)	23,264			sf	\$0.31	\$7,212	
Install GCL	472,717			sf	\$0.68	\$321,447	
Install 60 mil HDPE Liner Textured Both Sides	472,717			sf	\$0.60	\$283,630	
Install Double Sided Geocomposite	472,717			sf	\$0.83	\$392,355	
Install 60 mil HDPE Liner Textured Both Sides	472,717			sf	\$0.60	\$283,630	
Install Double Sided Geocomposite	472,717			sf	\$0.83	\$392,355	
Install 6" Corrugated Perforated HDPE Pipe Drain	1,193			lf	\$13.00	\$15,509	
Install 4" Corrugated Perforated HDPE Pipe Drain	7,226			lf	\$10.00	\$72,262	
Install Drain Rock	5,248			ton	\$22.50	\$118,075	
Install 8 oz Geotextile	472,717			sf	\$0.20	\$94,543	
CAP				0	\$0.00	\$0	
Import Structural Wedge Soil				cy	\$18.00	\$0	
Place and Compact Structural Wedge Soil	-			cy	\$2.85	\$0	
Anchor Trench	3,095			lf	\$2.73	\$8,449	
Install GCL	458,165			sf	\$0.68	\$311,552	
Install 60 mil HDPE Liner Textured Both Sides	458,165			sf	\$0.60	\$274,899	
Install Double Sided Geocomposite	458,165			sf	\$0.83	\$380,277	
Install 8 oz Geotextile CAP Drain	12,824			sf	\$0.20	\$2,565	
Install 4" Corrugated Perforated HDPE Pipe Drain	3,206			lf	\$10.00	\$32,060	
Install Drain Rock for Perimeter CAP Drain	767			ton	\$22.50	\$17,248	
Import Vegetative Cover	25,252			cy	\$30.00	\$757,548	
Place Vegetative Cover	25,252			cy	\$1.85	\$46,715	
Seed Cap	12.62			acre	\$1,750.00	\$22,088	
Additional Sampling for Leaving Soil On-site				ea	\$0.00	\$0	
					\$0.00	\$0	

Appendix D
Cost Estimate Detail
Alternative 2

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
5	Lined Excavation/Backfill	CELL			\$0.00	\$0	
		Grade Bottom Before Lining		sf	\$0.35	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install 16 oz. Geotextile		sf	\$0.31	\$0	
		Install Drain Rock		ton	\$22.50	\$0	
		Install 8 oz Geotextile		sf	\$0.20	\$0	
		CAP			\$0.00	\$0	
		Sump with Pump 30' Deep		ea	\$6,450.00	\$0	
		Import Soil		cy	\$18.00	\$0	
		Place and Compact Import Cover Soil		cy	\$2.85	\$0	
		Seed Cap		acre	\$1,750.00	\$0	
		Additional Sampling for Leaving Soil On-sit		ea	\$0.00	\$0	\$0
6	Off-site Treatment/Disposal	Tons per Cubic Yard		ton	1.60	\$0	
		Load, Transport and Incinerate Soil Off-site (Trucks)	-	ton	\$704.33	\$0	
		Load, Transport and Dispose at Subtitle "C" (Trucks)		ton	\$286.33	\$0	
		Load, Transport and Incinerate Soil Off-site (Rail)	-	ton	\$547.67	\$0	
		Load, Transport and Dispose at Subtitle "C" (Rail)		ton	\$249.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Transloading Facility		ls	\$15,000.00	\$0	
		Import Soil to Replace Removed Contaminated Soil		cy	\$18.00	\$0	
		Place and Compact Soil in Removal Location		cy	\$2.85	\$0	\$0
7	Site Restoration	Install Railroad Tracks 100 lb Rail, Wood Ties	1,960	lf	\$102.00	\$199,920	
		Install Tram		ls	\$0.00	\$0	
		Reinstall Fence	400	lf	\$13.00	\$5,200	
		Reinstall Asphalt/Concrete	15,300	sf	\$6.00	\$91,800	
		Building	7,800	sf	\$70.00	\$546,000	
		Gas Fired Boiler	1	ls	\$550,000.00	\$550,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Subtotal:					\$1,392,920
							\$23,483,755
	Miscellaneous	Engineering (Including Field Investigations)	8%			\$1,878,700	
		Local Permitting	5%			\$1,174,188	
		Plan Checks	0%			\$0	
		Construction Management/Project Management	8%			\$1,878,700	
		QA/QC	5%			\$1,174,188	
		Contingency	15%			\$3,522,563	
		Fee	10%			\$2,348,375	\$11,976,715
							Total: \$35,460,470

Appendix D
Cost Estimate Detail
Alternative 3

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
1	Demolition	Demolish Buildings	7,800	sf	\$4.25	\$33,150	\$160,600
		Demolish Paving	15,300	sf	\$3.00	\$45,900	
		Demolish/Recycle Rail Road Tracks		lf	\$0.00	\$0	
		Locate Utilities Geophysical	1	ls	\$8,000.00	\$8,000	
		Remove/Relocate Utilities	1	A lot	\$25,000.00	\$25,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Clear and Grub Treed Areas	1.30	Acre	\$3,500.00	\$4,550	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Remove Wood Fired Boiler	1	ls	\$40,000.00	\$40,000	
		Demolish Fence	400	lf	\$10.00	\$4,000	
					\$0.00	\$0	
2	Excavation	Install Dewatering Trench Bio Slurry Type	128,900	sf	\$15.50	\$1,997,950	\$7,813,988
		Install Dewatering Piping System	5,850	lf	\$26.75	\$156,488	
		Install Dewatering Sumps and Pumps (Every 200 lf)	28.00	ea	\$7,500.00	\$210,000	
		Install Dewatering Treatment System	1	ls	\$1,200,000.00	\$1,200,000	
		Operate Dewatering System	22,500,000	gal	\$0.015	\$337,500	
		Install/Later Remove Silt Fence	5,350	lf	\$5.00	\$26,750	
		Install/Remove Shoring	17,940	sf	\$32.50	\$583,050	
		Decontamination Pad	3	ls	\$35,000.00	\$105,000	
		Excavate Soil (Covers Direct Load of Trucks Option)	441,000	cy	\$4.50	\$1,984,500	
		Transport Soil to Stockpile	441,000	cy	\$2.75	\$1,212,750	
		Transport Soil to Site Landfill or Lined Excav., place and compact		cy	\$4.85	\$0	
		Import Soil to Fill in Excavations		cy	\$18.00	\$0	
		Place and Compact Soil		cy	\$2.85	\$0	
		Reseed Excavated Areas If Not Used as Cell		acre	\$1,750.00	\$0	
					\$0.00	\$0	
3	On-site Treatment of Soil	Tons per Cubic Yard		ton	1.60	\$0	\$59,286,430
		Lined Stockpile/Treatment Area with Elevated Berm/Barrier	119,194	sf	\$0.72	\$85,820	
		Stabilize Soil On-site	106,400	ton	\$25.00	\$2,660,000	
		Pre-Treatment Processing	705,600	ton	\$0.00	\$0	
		Thermal Treat Soil On-site	705,600	ton	\$75.00	\$52,920,000	
		Load, Transport and Compact Treated Soil On-Site	441,000	cy	\$7.25	\$3,197,250	
		Load, Transport and Load for Off-site Disposal		cy	\$10.10	\$0	
		Pre/Post Treatment Sampling	1,693	samp	\$250.00	\$423,360	
		On-site Incineration with Mob/Demob Allocation	-	ton	\$2,000.00	\$0	
						\$0	
4	On-site Landfill	CELL					\$0
		Install Replacement Storm water Control Ditch		cy	\$7.15	\$0	
		Excavate, Transport and Stockpile Bottom Foundation of Landfill		cy	\$4.00	\$0	
		Import Soil for Containment Berms		cy	\$18.00	\$0	
		Place and Compact Containment Berms		cy	\$2.85	\$0	
		Grade Bottom Before Lining		sf	\$0.35	\$0	
		Anchor Trench		lf	\$2.73	\$0	
		Install GCL (Sump)		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides (Sump)		sf	\$0.60	\$0	
		Install 16 oz. Geotextile (Sump)		sf	\$0.31	\$0	
		Install Drain Rock (Sump)		ton	\$22.50	\$0	
		Install 4" PVC Sump Pipe (Sump)		lf	\$4.00	\$0	
		Install Geotextile 16 oz (Sump)		sf	\$0.31	\$0	
		Install GCL		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 6" Corrugated Perforated HDPE Pipe Drain		lf	\$13.00	\$0	
		Install 4" Corrugated Perforated HDPE Pipe Drain		lf	\$10.00	\$0	
		Install Drain Rock		ton	\$22.50	\$0	
		Install 8 oz Geotextile		sf	\$0.20	\$0	
		CAP		0	\$0.00	\$0	
		Import Structural Wedge Soil		cy	\$18.00	\$0	
		Place and Compact Structural Wedge Soil		cy	\$2.85	\$0	
		Anchor Trench		lf	\$2.73	\$0	
		Install GCL		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 8 oz Geotextile CAP Drain		sf	\$0.20	\$0	
		Install 4" Corrugated Perforated HDPE Pipe Drain		lf	\$10.00	\$0	
		Install Drain Rock for Perimeter CAP Drain		ton	\$22.50	\$0	
		Import Vegetative Cover		cy	\$30.00	\$0	
		Place Vegetative Cover		cy	\$1.85	\$0	
		Seed Cap		acre	\$1,750.00	\$0	
		Additional Sampling for Leaving Soil On-site		ea	\$0.00	\$0	
					\$0.00	\$0	

Appendix D
Cost Estimate Detail
Alternative 3

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
5	Lined Excavation/Backfill	CELL			\$0.00	\$0	
		Grade Bottom Before Lining	813,500	sf	\$0.35	\$284,725	
		Install 60 mil HDPE Liner Textured Both Sides	813,500	sf	\$0.60	\$488,100	
		Install 16 oz. Geotextile	813,500	sf	\$0.31	\$252,185	
		Install Drain Rock	49,714	ton	\$22.50	\$1,118,563	
		Install 8 oz Geotextile	813,500	sf	\$0.20	\$162,700	
		CAP			\$0.00	\$0	
		Sump with Pump 30' Deep	8	ea	\$6,450.00	\$51,600	
		Import Soil	36,156	cy	\$18.00	\$650,800	
		Place and Compact Import Cover Soil	36,156	cy	\$2.85	\$103,043	
		Seed Cap	22.41	acre	\$1,750.00	\$39,218	
		Additional Sampling for Leaving Soil On-sit		ea	\$0.00	\$0	\$3,150,934
6	Off-site Treatment/Disposal	Tons per Cubic Yard		ton	1.60	\$0	
		Load, Transport and Incinerate Soil Off-site (Trucks)	-	ton	\$704.33	\$0	
		Load, Transport and Dispose at Subtitle "C" (Trucks)		ton	\$286.33	\$0	
		Load, Transport and Incinerate Soil Off-site (Rail)	-	ton	\$547.67	\$0	
		Load, Transport and Dispose at Subtitle "C" (Rail)		ton	\$249.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Transloading Facility		ls	\$15,000.00	\$0	
		Import Soil to Replace Removed Contaminated Soil		cy	\$18.00	\$0	
		Place and Compact Soil in Removal Location		cy	\$2.85	\$0	\$0
7	Site Restoration	Install Railroad Tracks 100 lb Rail, Wood Ties		lf	\$102.00	\$0	
		Install Tram		ls	\$0.00	\$0	
		Reinstall Fence	400	lf	\$13.00	\$5,200	
		Reinstall Asphalt/Concrete	15,300	sf	\$6.00	\$91,800	
		Building	7,800	sf	\$70.00	\$546,000	
		Gas Fired Boiler	1	ls	\$550,000.00	\$550,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	\$1,193,000
		Subtotal:					\$71,604,951
	Miscellaneous	Engineering (Including Field Investigations)	8%			\$5,728,396	
		Local Permitting	5%			\$3,580,248	
		Plan Checks	0%			\$0	
		Construction Management/Project Management	8%			\$5,728,396	
		QA/QC	5%			\$3,580,248	
		Contingency	15%			\$10,740,743	
		Fee	10%			\$7,160,495	\$36,518,525
		Total:					\$108,123,477

Appendix D
Cost Estimate Detail
Alternative 4

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
1	Demolition	Demolish Buildings	7,800	sf	\$4.25	\$33,150	\$160,600
		Demolish Paving	15,300	sf	\$3.00	\$45,900	
		Demolish/Recycle Rail Road Tracks		lf	\$0.00	\$0	
		Locate Utilities Geophysical	1	ls	\$8,000.00	\$8,000	
		Remove/Relocate Utilities	1	A lot	\$25,000.00	\$25,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Clear and Grub Treed Areas	1.30	Acre	\$3,500.00	\$4,550	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Remove Wood Fired Boiler	1	ls	\$40,000.00	\$40,000	
		Demolish Fence	400	lf	\$10.00	\$4,000	
					\$0.00	\$0	
2	Excavation	Install Dewatering Trench Bio Slurry Type	128,900	sf	\$15.50	\$1,997,950	\$16,968,925
		Install Dewatering Piping System	5,850	lf	\$26.75	\$156,488	
		Install Dewatering Sumps and Pumps (Every 200 lf)	28.00	ea	\$7,500.00	\$210,000	
		Install Dewatering Treatment System	1	ls	\$1,200,000.00	\$1,200,000	
		Operate Dewatering System	22,500,000	gal	\$0.015	\$337,500	
		Install/Later Remove Silt Fence	5,350	lf	\$5.00	\$26,750	
		Install/Remove Shoring	17,940	sf	\$32.50	\$583,050	
		Decontamination Pad	1	ls	\$35,000.00	\$35,000	
		Excavate Soil (Covers Direct Load of Trucks Option)	441,000	cy	\$4.50	\$1,984,500	
		Transport Soil to Stockpile	441,000	cy	\$2.75	\$1,212,750	
		Transport Soil to Site Landfill or Lined Excav., place and compact		cy	\$4.85	\$0	
		Import Soil to Fill in Excavations	441,000	cy	\$18.00	\$7,938,000	
		Place and Compact Soil	441,000	cy	\$2.85	\$1,256,850	
		Reseed Excavated Areas If Not Used as Cell	17.19	acre	\$1,750.00	\$30,087	
					\$0.00	\$0	
3	On-site Treatment of Soil	Tons per Cubic Yard		ton	1.60	\$0	\$126,305
		Lined Stockpile/Treatment Area with Elevated Berm/Barrier	175,424	sf	\$0.72	\$126,305	
		Stabilize Soil On-site	-	ton	\$25.00	\$0	
		Pre-Treatment Processing	-	ton	\$0.00	\$0	
		Thermal Treat Soil On-site	-	ton	\$75.00	\$0	
		Load, Transport and Compact Treated Soil On-Site	-	cy	\$7.25	\$0	
		Load, Transport and Load for Off-site Disposal	-	cy	\$10.10	\$0	
		Pre/Post Treatment Sampling	-	samp	\$250.00	\$0	
		On-site Incineration with Mob/Demob Allocation	-	ton	\$2,000.00	\$0	
						\$0	
4	On-site Landfill	CELL					\$0
		Install Replacement Storm water Control Ditch		cy	\$7.15	\$0	
		Excavate, Transport and Stockpile Bottom Foundation of Landfill		cy	\$4.00	\$0	
		Import Soil for Containment Berms		cy	\$18.00	\$0	
		Place and Compact Containment Berms		cy	\$2.85	\$0	
		Grade Bottom Before Lining		sf	\$0.35	\$0	
		Anchor Trench		lf	\$2.73	\$0	
		Install GCL (Sump)		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides (Sump)		sf	\$0.60	\$0	
		Install 16 oz. Geotextile (Sump)		sf	\$0.31	\$0	
		Install Drain Rock (Sump)		ton	\$22.50	\$0	
		Install 4" PVC Sump Pipe (Sump)		lf	\$4.00	\$0	
		Install Geotextile 16 oz (Sump)		sf	\$0.31	\$0	
		Install GCL		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 6" Corrugated Perforated HDPE Pipe Drain		lf	\$13.00	\$0	
		Install 4" Corrugated Perforated HDPE Pipe Drain		lf	\$10.00	\$0	
		Install Drain Rock		ton	\$22.50	\$0	
		Install 8 oz Geotextile		sf	\$0.20	\$0	
		CAP		0	\$0.00	\$0	
		Import Structural Wedge Soil		cy	\$18.00	\$0	
		Place and Compact Structural Wedge Soil		cy	\$2.85	\$0	
		Anchor Trench		lf	\$2.73	\$0	
		Install GCL		sf	\$0.68	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install Double Sided Geocomposite		sf	\$0.83	\$0	
		Install 8 oz Geotextile CAP Drain		sf	\$0.20	\$0	
		Install 4" Corrugated Perforated HDPE Pipe Drain		lf	\$10.00	\$0	
		Install Drain Rock for Perimeter CAP Drain		ton	\$22.50	\$0	
		Import Vegetative Cover		cy	\$30.00	\$0	
		Place Vegetative Cover		cy	\$1.85	\$0	
		Seed Cap		acre	\$1,750.00	\$0	
Additional Sampling for Leaving Soil On-site		ea	\$0.00	\$0			
			\$0.00	\$0			

Appendix D
Cost Estimate Detail
Alternative 4

NO.	ELEMENTS	ACTIVITIES	US Quantity	US Units	US UNIT RATE	SUBTOTAL	ELEMENT SUBTOTALS
5	Lined Excavation/Backfill	CELL			\$0.00	\$0	
		Grade Bottom Before Lining		sf	\$0.35	\$0	
		Install 60 mil HDPE Liner Textured Both Sides		sf	\$0.60	\$0	
		Install 16 oz. Geotextile		sf	\$0.31	\$0	
		Install Drain Rock		ton	\$22.50	\$0	
		Install 8 oz Geotextile		sf	\$0.20	\$0	
		CAP			\$0.00	\$0	
		Sump with Pump 30' Deep		ea	\$6,450.00	\$0	
		Import Soil		cy	\$18.00	\$0	
		Place and Compact Import Cover Soil		cy	\$2.85	\$0	
		Seed Cap		acre	\$1,750.00	\$0	
		Additional Sampling for Leaving Soil On-sit		ea	\$0.00	\$0	\$0
6	Off-site Treatment/Disposal	Tons per Cubic Yard		ton	1.60	\$0	
		Load, Transport and Incinerate Soil Off-site (Trucks)	-	ton	\$704.33	\$0	
		Load, Transport and Dispose at Subtitle "C" (Trucks)	352,800	ton	\$286.33	\$101,017,224	
		Load, Transport and Incinerate Soil Off-site (Rail)	-	ton	\$547.67	\$0	
		Load, Transport and Dispose at Subtitle "C" (Rail)	352,800	ton	\$249.00	\$87,847,200	
					\$0.00	\$0	
					\$0.00	\$0	
		Transloading Facility	1	ls	\$15,000.00	\$15,000	
		Import Soil to Replace Removed Contaminated Soil		cy	\$18.00	\$0	
		Place and Compact Soil in Removal Location	-	cy	\$2.85	\$0	\$188,879,424
7	Site Restoration	Install Railroad Tracks 100 lb Rail, Wood Ties	2,290	lf	\$102.00	\$233,580	
		Install Tram		ls	\$0.00	\$0	
		Reinstall Fence	400	lf	\$13.00	\$5,200	
		Reinstall Asphalt/Concrete	15,300	sf	\$6.00	\$91,800	
		Building	7,800	sf	\$70.00	\$546,000	
		Gas Fired Boiler	1	ls	\$550,000.00	\$550,000	
					\$0.00	\$0	
					\$0.00	\$0	
					\$0.00	\$0	
		Subtotal:				\$0	\$1,426,580
							\$207,561,834
	Miscellaneous	Engineering (Including Field Investigations)	1.33%			\$2,767,491	
		Local Permitting	0.83%			\$1,729,682	
		Plan Checks	0.00%			\$0	
		Construction Management/Project Management	1.33%			\$2,767,491	
		QA/QC	0.83%			\$1,729,682	
		Contingency	2.50%			\$5,189,046	
		Fee	1.67%			\$3,459,364	\$17,642,756
							Total: \$225,204,590

Appendix D
Landfill Backup

Category	Item	Quantity	Unit	Description
Waste	Waste Volume	441,000	yard ³	(excluding cover, liner, and berm)
	Waste Mass	700,000	ton	(assuming 1.6 ton / yard ³)
	Waste Height	34	feet	(above 1' liner)
	Total Height	37	feet	(including 2' cover & 1' liner)
	Dimension: South	350	feet	at elevation 10' above liner
	Dimension: North	370	feet	at elevation 10' above liner
	Dimension: East	1,295	feet	at elevation 10' above liner
	Dimension: West	1,175	feet	at elevation 10' above liner
Cover	Soil Cover Thickness	2	feet	Design Specified
	Soil Cover Volume	25,252	yard ³	Rough Calculation
	Soil Cover Surface Area	7,826	acre	Rough Calculation
	Double Sided Geocomposite	10.52	acre	extra 8' to all sides for anchoring (2'x 2' anchor trench)
	60-mil. Textured HDPE	10.52	acre	extra 8' to all sides for anchoring (2'x 2' anchor trench)
	Geosynthetic Clay Liner	10.52	acre	extra 8' to all sides for anchoring (2'x 2' anchor trench)
	8 oz. Filter Geotextile	0.294	acre	2' x 2' anchor trench
	4" HDPE Pipe	3,206	feet	2' from waste dimension show above
	Gravel Fill	465	yard ³	excluding space for 4" HDPE Pipe
Berm	Import Soil Volume	54,484	yard ³	Estimating middle point 6.3' from waste edge, excluding space for two anchor trenches
Liner (from top to bottom)	8 oz. Geotextile Filter	10.85	acre	Middle of 2'x2' anchor trench located 5' from the top of berm edge
	Drain Rock	3,180	yard ³	Only to side of the berm + gravel fill in anchor trench
	8 oz. Geotextile Filter	0.137	acre	Cover for 6" Pipe running through middle of the landfill bottom
	6" HDPE Pipe	1,193	feet	Distance from mid point of South end to mid point of North end
	4" HDPE Pipe	7,226	feet	Placed every 50' from North and South Ends - including 22 pipes 310' long, and 137' and 270' long pipes
	Double Sided Geocomposite	10.85	acre	Estimated to be similar in size to the 8 oz. Geotextile Filter at the very top of liner
	60-mil. Textured (both sides)HDPE	10.85	acre	Estimated to be similar in size to the 8 oz. Geotextile Filter at the very top of liner
	Single-sided Geocomposite	10.85	acre	Estimated to be similar in size to the 8 oz. Geotextile Filter at the very top of liner
	Double-sided Geocomposite	10.85	acre	Estimated to be similar in size to the 8 oz. Geotextile Filter at the very top of liner
	60-mil. Textured (both sides)HDPE	10.85	acre	Estimated to be similar in size to the 8 oz. Geotextile Filter at the very top of liner
	Geosynthetic Clay Liner	10.85	acre	Estimated to be similar in size to the 8 oz. Geotextile Filter at the very top of liner
	16 oz. Geotextile	0.53	acre	Including 1' overlap, the drainage trench runs underneath 6" HDPE Pipe
	Drain Rock	305.4	yard ³	1' deep trench, excluding space for 4" HDPE Pipe
	4" HDPE Pipe	1,193	yard ³	Same length as 6" HDPE Pipe
	60-mil. Textured (both sides)HDPE	0.315	acre	Extra foot both sides
Geosynthetic Clay Liner	0.315	acre	Estimated to be same area as above (60-mil. HDPE)	
Landfill Overlap on Excavation Areas	Drip Trap Overlap Volume	28,000	yard ³	
	Drip Trap Surface Area Overlap	33,000	sf	
	North Lagoon Overlap Volume	910	yard ³	
	North Lagoon Surface Area Overlap	1,100	sf	

Appendix D
Excavation Area Backup

Category	Item	Quantity	Unit	Description
South Lagoon Shoring	Length	330	feet	East of South Lagoon excavation area (measured off figure 3.1)
	Depth	23	feet	Based on excavation plan (ch.3)
	Area	7,590	feet ²	Length x Depth
Process Area Shoring	Length	450	feet	West of Process Area excavation (measured off figure 3.1)
	Depth	23	feet	Based on excavation plan (ch.3)
	Area	10,350	feet ²	Length x Depth
Runoff Ditch (around onsite Landfill)	Length	1,000	feet	Estimated from figure 3.1
	X-Area	75	feet ²	Trapezoidal Trench: 5' deep, 5' wide bottom, 2:1 slope both sides
	Excavation Volume	2,778	yard ³	Volume of soil to be excavated
Process Area	Total Excavation Goal	136,000	yard ³	Calculation by Ken and Yasser
	Excavation Area	156,000	feet ²	Jeff
	Excavation Liner Area	207,500	feet ²	Jeff
	Trench Total Length	1,400	feet	Estimated from figure 3.1
	Trench Width	1.5	feet	Figure 3.2
	Trench Depth	24.1	feet	For each side - averaged depth considering 2% grading
	Trench	33,740	SF	
	Gravel Fill	1,874	yard ³	Total volume of gravel required to fill all four trenches, no top soil cover
	4" Well	7	Well	Total Length divided by 200 feet
	Total 4" Drainage Pipe Length	1,400	feet	All four sides summed
Drip Track Area	Total Excavation Goal	70,000	yard ³	Calculation by Ken and Yasser
	Excavation Area	112,100	feet ²	Jeff
	Excavation Liner Area	152,400	feet ²	Jeff
	Trench Total Length	1,200	feet	Estimated from figure 3.1
	Trench Width	1.5	feet	Figure 3.2
	Trench Depth (West and East)	24.1	feet	West and East sides - averaged depth considering 2% grading
	Trench Depth (North and South)	24.5	feet	North and South sides - averaged depth considering 2% grading
	Trench	29,160	SF	
	Gravel Fill	1,611	yard ³	Total volume of gravel required to fill all four trenches, no top soil cover
	4" Well	6	Well	Total Length divided by 200 feet
Total 4" Drainage Pipe Length	1,200	feet	All four sides summed	
South Lagoon Area	Total Excavation Goal	130,000	yard ³	Calculation by Ken and Yasser
	Excavation Area	192,000	feet ²	Jeff
	Excavation Liner Area	240,400	feet ²	Jeff
	Trench Total Length	1,440	feet	Estimated from figure 3.1
	Trench Width	1.5	feet	Figure 3.2
	Average Trench Depth	24	feet	Averaged depth considering 2% grading
	Trench	34,560	SF	
	Gravel Fill	1,920	yard ³	Total volume of gravel required to fill all four trenches, no top soil cover
	4" Well	8	Well	Total Length divided by 200 feet
	Total 4" Drainage Pipe Length	1,440	feet	All four sides summed
North Lagoon Area	Total Excavation Goal	105,000	yard ³	Calculation by Ken and Yasser
	Excavation Area	164,000	feet ²	
	Excavation Liner Area	213,200	feet ²	
	Trench Total Length	1,310	feet	Estimated from figure 3.1
	Trench Width	1.5	feet	Figure 3.2
	Average Trench Depth	24.0	feet	Averaged depth considering 2% grading
	Trench	31,440	SF	
	Gravel Fill	1,747	yard ³	Total volume of gravel required to fill all four trenches, no top soil cover
	4" Well	7	Well	Total Length divided by 200 feet
	Total 4" Drainage Pipe Length	1,310	feet	All four sides summed
Total (North + South + Process + Drip Track)	Total Excavation Goal	441,000	yard ³	
	Total Excavation Area	624,100	feet ²	
	Total Excavation Liner Area	813,500	feet ²	
	Trench Total Length	5,350	feet	
	Gravel Fill	7,152	yard ³	
	Total Trench	128,900	SF	
4" Well	28	Well		
Total 4" Drainage Pipe Length	5,350	feet		

Appendix D
Cost Estimate Detail
Unit Costs

NO.	ELEMENTS	ACTIVITIES	US Units	US UNIT	SOURCE
5	Lined Excavation/Backfill	CELL			
		Grade Bottom Before Lining	sf	\$0.35	Sevenson
		Install 60 mil HDPE Liner Textured Both Sides	sf	\$0.60	Sevenson
		Install 16 oz. Geotextile	sf	\$0.31	Sevenson
		Install Drain Rock	ton	\$22.50	Sevenson
		Install 8 oz Geotextile	sf	\$0.20	Sevenson
		CAP			
		Sump with Pump 30' Deep	ea	\$6,450	Sevenson
		Import Soil	cy	\$18	Estimated Price
		Place and Compact Import Cover Soil	cy	\$2.85	Sevenson
		Seed Cap	acre	\$1,750	Sevenson
		Additional Sampling for Leaving Soil On-sit	ea	\$0	
		6	Off-site Treatment/Disposal	Tons per Cubic Yard	ton
Load, Transport and Incinerate Soil Off-site (Trucks)	ton			\$704.33	Ave of Deer Park, Aragonite and Kimball
Load, Transport and Dispose at Subtitle "C" (Trucks)	ton			\$286.33	Ave of Deer Park, Aragonite and Kimball
Load, Transport and Incinerate Soil Off-site (Rail)	ton			\$547.67	Ave of Grassy Mountain, Emelle and Lake Charles
Load, Transport and Dispose at Subtitle "C" (Rail)	ton			\$249.00	Grassy Mountain Site
				\$0	
				\$0	
Transloading Facility	ls			\$15,000	
Import Soil to Replace Removed Contaminated Soil	cy			\$18	Estimated Price
Place and Compact Soil in Removal Location	cy			\$2.85	Sevenson
7	Site Restoration	Install Railroad Tracks 100 lb Rail, Wood Ties	lf	\$102.00	Means 2002 Heavy Construction Cost Data
		Install Tram	ls	\$0.00	
		Reinstall Fence	lf	\$13.00	Previous Experience
		Reinstall Asphalt/Concrete	sf	\$6.00	Estimated Price Average
		Building	sf	\$70.00	Estimated Price
		Gas Fired Boiler	ls	\$550,000.00	Input from Koppers Inc
				\$0.00	
				\$0.00	
8	O+M	Labor Operation Cost of System per Year	yr	\$38,860	
		Monitoring/Reporting per Year	yr	\$40,564	
		Electric Cost Per Year	yr	\$21,600	
		Gas Cost per Year	yr	\$18,000	
		Carbon Cost per Year	yr	\$5,000	
				\$0	
				\$0	
				\$0	
		Chemical Use Cost per Year	yr	\$1,500	
				\$0	
Subtotal:					
Miscellaneous	Engineering (Including Field Investigations)		8%		
	Local Permitting		5%		
	Plan Checks		0%		
	Construction Management/Project Management		8%		
	QA/QC		5%		
	Contingency		15%		
	Fee		10%		
			Total:		