US Environmental Protection Agency
Office of Pesticide Programs

Appendix D:
Additional Atrazine Monitoring Data

August 31, 2007

Appendix D: Additional Atrazine Monitoring Data

A summary of the USGS NASQAN, LDEQ, and Ecological Monitoring data is provided in Sections 3.2.6.1 through 3.2.6.3, respectively. Additional atrazine monitoring data including a complete summary of the USGS NASQAN data, and the results from the Ecological Monitoring Program, USGS NAWQA, Heidelberg College, open literature sources, and drinking water monitoring are discussed in Sections D.1 through D.6.

D.1 USGS NASQAN Data

A complete summary of the USGS NASQAN data for each individual station by year is provided below in Table D.1.

D.2 Ecological Monitoring Program Data

A summary of the results of the Ecological Monitoring Program data is provided in the following tables:

- Table D.2: Summary of Site Nomenclature for 40 Atrazine Ecological Monitoring Sites
- Table D.3: Summary of 2004 to 2006 Atrazine Ecological Monitoring Surface Water Data
- Table D.4: Summary of Rolling Averages from Ecological Monitoring Data for Comparison with Threshold Concentrations
- Table D.5: Summary of Number of Watersheds from Ecological Monitoring Data that Exceed PRZM Flow-Adjusted EECs
- Table D.6: Comparison of Flow Rates and Ecological Monitoring Sites Above Flow-Adjusted Modeling
- Table D.7: Comparison of Flow Rates and Ecological Monitoring Sites Greater Than Two Times Above Flow-Adjusted Modeling
- Table D.8: Comparison of Results from Targeted and Non-targeted Monitoring Data

Table D.1 Summary of USGS NASQAN Atrazine Data						
Station	**NAME**	**Latitude**	**Longitude**	**Date**	**TWM**	**Max**
3216600	Ohio River at Greenup Dam near Greenup, KY	38.646944	-82.860000	3/4/97	0.221	1.480
3216600	Ohio River at Greenup Dam near Greenup, KY	38.646944	-82.860000	4/17/00	0.141	1.180
3216600	Ohio River at Greenup Dam near Greenup, KY	38.646944	-82.860000	4/21/98	0.108	0.704
3216600	Ohio River at Greenup Dam near Greenup, KY	38.646944	-82.860000	4/1/99	0.057	0.311
3303280	Ohio River at Cannelton Dam at Cannelton, IN	37.900000	-86.706111	3/20/97	0.618	2.370
3303280	Ohio River at Cannelton Dam at Cannelton, IN	37.900000	-86.706111	4/24/96	0.361	3.000
3303280	Ohio River at Cannelton Dam at Cannelton, IN	37.900000	-86.706111	4/8/98	0.352	1.490
3303280	Ohio River at Cannelton Dam at Cannelton, IN	37.900000	-86.706111	4/19/00	0.224	1.100
3303280	Ohio River at Cannelton Dam at Cannelton, IN	37.900000	-86.706111	4/21/99	0.156	0.690
3378500	Wabash River at New Harmony, IN	38.131944	-87.940000	3/19/97	2.066	20.700
3378500	Wabash River at New Harmony, IN	38.131944	-87.940000	3/24/98	1.788	10.400
3378500	Wabash River at New Harmony, IN	38.131944	-87.940000	4/13/99	1.243	11.600
3378500	Wabash River at New Harmony, IN	38.131944	-87.940000	5/23/00	1.241	5.170
3609750	Tennessee River at Highway 60 near Paducah, KY	37.038056	-88.528889	4/28/99	0.167	0.584
3609750	Tennessee River at Highway 60 near Paducah, KY	37.038056	-88.528889	4/27/00	0.150	0.474
3609750	Tennessee River at Highway 60 near Paducah, KY	37.038056	-88.528889	4/22/98	0.133	0.488

Table D.1 Summary of USGS NASQAN Atrazine Data						
Station	**NAME**	**Latitude**	**Longitude**	**Date**	**TWM**	**Max**
3609750	Tennessee River at Highway 60 near Paducah, KY	37.038056	-88.528889	3/12/97	0.116	0.680
3612500	Ohio River at Dam 53 near Grand Chain, IL	37.203056	-89.041944	4/9/96	1.138	7.640
3612500	Ohio River at Dam 53 near Grand Chain, IL	37.203056	-89.041944	3/11/97	1.027	8.190
3612500	Ohio River at Dam 53 near Grand Chain, IL	37.203056	-89.041944	3/26/98	0.761	4.260
3612500	Ohio River at Dam 53 near Grand Chain, IL	37.203056	-89.041944	4/14/99	0.565	2.730
3612500	Ohio River at Dam 53 near Grand Chain, IL	37.203056	-89.041944	4/5/00	0.235	2.560
5330000	Minnesota River near Jordan, MN	44.693056	-93.641944	4/2/98	0.182	1.090
5330000	Minnesota River near Jordan, MN	44.693056	-93.641944	6/13/96	0.176	1.800
5330000	Minnesota River near Jordan, MN	44.693056	-93.641944	3/17/97	0.129	1.090
5331580	Mississippi R. below Lock & Dam 2 at Hastings, MN	44.746944	-92.851944	5/26/99	0.127	0.765
5331580	Mississippi R. below Lock & Dam 2 at Hastings, MN	44.746944	-92.851944	4/7/98	0.108	0.356
5331580	Mississippi R. below Lock & Dam 2 at Hastings, MN	44.746944	-92.851944	4/12/97	0.083	0.484
5331580	Mississippi R. below Lock & Dam 2 at Hastings, MN	44.746944	-92.851944	5/15/96	0.063	0.190
5420500	Mississippi River at Clinton, IA	41.781111	-90.251944	4/28/99	0.262	2.440
5420500	Mississippi River at Clinton, IA	41.781111	-90.251944	5/22/00	0.235	1.510
5420500	Mississippi River at Clinton, IA	41.781111	-90.251944	4/23/96	0.169	0.810

Table D.1 Summary of USGS NASQAN Atrazine Data						
Station	**NAME**	**Latitude**	**Longitude**	**Date**	**TWM**	**Max**
5420500	Mississippi River at Clinton, IA	41.781111	-90.251944	5/11/98	0.151	0.847
5420500	Mississippi River at Clinton, IA	41.781111	-90.251944	4/8/97	0.134	1.150
5587455	Mississippi River below Grafton, IL	38.951111	-90.371111	3/17/98	0.957	5.960
5587455	Mississippi River below Grafton, IL	38.951111	-90.371111	4/12/99	0.794	3.760
5587455	Mississippi River below Grafton, IL	38.951111	-90.371111	4/3/97	0.774	5.070
5587455	Mississippi River below Grafton, IL	38.951111	-90.371111	4/3/00	0.530	2.510
6185500	Missouri River near Culbertson, MT	48.123056	-104.475000	5/18/99	0.002	0.005
6185500	Missouri River near Culbertson, MT	48.123056	-104.475000	5/19/98	0.002	0.007
6185500	Missouri River near Culbertson, MT	48.123056	-104.475000	5/21/97	0.002	0.003
6185500	Missouri River near Culbertson, MT	48.123056	-104.475000	5/1/00	0.001	0.002
6329500	Yellowstone River near Sidney, MT	47.678056	-104.156944	2/24/99	0.017	0.177
6329500	Yellowstone River near Sidney, MT	47.678056	-104.156944	6/18/96	0.009	0.048
6329500	Yellowstone River near Sidney MT	47.678056	-104.156944	4/16/97	0.006	0.009
6329500	Yellowstone River near Sidney, MT	47.678056	-104.156944	4/19/00	0.005	0.019
6329500	Yellowstone River near Sidney, MT	47.678056	-104.156944	5/5/98	0.004	0.008
6338490	Missouri River at Garrison Dam, ND	47.501944	-101.431110	5/13/99	0.005	0.008
6338490	Missouri River at Garrison Dam, ND	47.501944	-101.431110	5/22/98	0.004	0.007

Table D.1 Summary of USGS NASQAN Atrazine Data						
Station	**NAME**	**Latitude**	**Longitude**	**Date**	**TWM**	**Max**
6338490	Missouri River at Garrison Dam, ND	47.501944	-101.431110	6/13/97	0.003	0.007
6338490	Missouri River at Garrison Dam, ND	47.501944	-101.431110	5/15/00	0.003	0.007
6440000	Missouri River at Pierre, SD	44.373056	-100.368056	6/10/97	0.022	0.052
6440000	Missouri River at Pierre, SD	44.373056	-100.368056	6/9/99	0.014	0.020
6440000	Missouri River at Pierre, SD	44.373056	-100.368056	6/14/00	0.014	0.017
6440000	Missouri River at Pierre, SD	44.373056	-100.368056	8/19/98	0.009	0.012
6610000	Missouri River at Omaha, NE	41.258889	-95.923056	3/28/96	0.395	4.000
6610000	Missouri River at Omaha, NE	41.258889	-95.923056	3/24/98	0.230	2.200
6610000	Missouri River at Omaha, NE	41.258889	-95.923056	3/15/99	0.167	1.080
6610000	Missouri River at Omaha, NE	41.258889	-95.923056	4/4/00	0.103	0.916
6610000	Missouri River at Omaha, NE	41.258889	-95.923056	4/4/97	0.097	0.338
6805500	Platte River at Louisville, NE	41.015000	-96.158056	5/25/96	7.419	34.000
6805500	Platte River at Louisville, NE	41.015000	-96.158056	3/20/98	1.441	25.100
6805500	Platte River at Louisville, NE	41.015000	-96.158056	4/14/99	1.083	13.000
6805500	Platte River at Louisville, NE	41.015000	-96.158056	5/15/97	0.624	6.560
6805500	Platte River at Louisville, NE	41.015000	-96.158056	3/21/00	0.380	3.140
6934500	Missouri River at Hermann, MO	38.710000	-91.438889	3/29/96	0.959	4.700

Table D.1 Summary of USGS NASQAN Atrazine Data						
Station	**NAME**	**Latitude**	**Longitude**	**Date**	**TWM**	**Max**
6934500	Missouri River at Hermann, MO	38.710000	-91.438889	4/1/98	0.896	7.400
6934500	Missouri River at Hermann, MO	38.710000	-91.438889	4/19/99	0.606	3.090
6934500	Missouri River at Hermann, MO	38.710000	-91.438889	3/10/97	0.513	2.630
6934500	Missouri River at Hermann, MO	38.710000	-91.438889	5/5/00	0.471	4.340
7022000	Mississippi River at Thebes, IL	37.216944	-89.463889	3/26/96	1.020	5.500
7022000	Mississippi River at Thebes, IL	37.216944	-89.463889	8/11/98	0.998	5.960
7022000	Mississippi River at Thebes, IL	37.216944	-89.463889	8/11/99	0.668	4.440
7022000	Mississippi River at Thebes, IL	37.216944	-89.463889	8/14/00	0.636	2.820
7022000	Mississippi River at Thebes, IL	37.216944	-89.463889	6/11/97	0.426	2.050
7263620	Arkansas River at David D. Terry Lock & Dam	34.668889	-92.155000	5/24/99	0.464	0.866
7263620	Arkansas River at David D. Terry Lock & Dam	34.668889	-92.155000	5/5/00	0.411	0.762
7263620	Arkansas River at David D. Terry Lock & Dam	34.668889	-92.155000	3/10/97	0.320	0.636
7263620	Arkansas River at David D. Terry Lock & Dam	34.668889	-92.155000	5/2/98	0.318	0.585
7263620	Arkansas River at David D. Terry Lock & Dam	34.668889	-92.155000	3/12/96	0.263	0.420
7373420	Mississippi River near St. Francisville, LA	30.758889	-91.396111	6/19/97	0.679	4.710
7373420	Mississippi River near St. Francisville, LA	30.758889	-91.396111	8/5/99	0.412	1.830
7373420	Mississippi River near St. Francisville, LA	30.758889	-91.396111	5/1/96	0.291	4.400

Table D.1 Summary of USGS NASQAN Atrazine Data						
Station	**NAME**	**Latitude**	**Longitude**	**Date**	**TWM**	**Max**
7373420	Mississippi River near St. Francisville, LA	30.758889	-91.396111	6/23/00	0.285	2.010
7373420	Mississippi River near St. Francisville, LA	30.758889	-91.396111	7/30/98	0.126	1.950
7381495	Atchafalaya River at Melville, LA	30.691111	-91.736111	5/2/96	0.870	4.100
7381495	Atchafalaya River at Melville, LA	30.691111	-91.736111	3/13/97	0.519	2.890
7381495	Atchafalaya River at Melville, LA	30.691111	-91.736111	4/13/00	0.457	1.510
7381495	Atchafalaya River at Melville, LA	30.691111	-91.736111	3/29/99	0.339	1.640
7381495	Atchafalaya River at Melville, LA	30.691111	-91.736111	3/19/98	0.250	1.840

Table D.2 Summary of Site Nomenclature for 40 Atrazine Ecological Monitoring Sites		
SITE	**GROUP**	**WATERSHED NAME**
IA 01	2004 - 2005	WOLF CREEK
IA 02	2004 - 2005	NISHNABOTNA RIVER
IL 01	2004 - 2005	PECATTONICA RIVER
IL 02	2004 - 2005	PINE CREEK
IL 03	2005 - 2006	SPRING CREEK
IL 04	2004 - 2005	IROQUOIS RIVER
IL 05	2004 - 2005	PANTHER CREEK

Table D.2 Summary of Site Nomenclature for 40 Atrazine Ecological Monitoring Sites		
SITE	**GROUP**	**WATERSHED NAME**
IL 06	2004 - 2005	SUGER CREEK WEST FORK
IL 07	2004 - 2005	GRINDSTONE CREEK
IL 08	2005 - 2006	HORSE CREEK
IL 09	2005 - 2006	MUDDY CREEK (IL)
IN 01	2004 - 2005	MILL CREEK
IN 02	2004 - 2005	EEL RIVER
IN 03	2005 - 2006	EIGHTMILE CREEK
IN 04*	2004 - 2006	ROCK CREEK
IN 05*	2004 - 2006	LIMBER LOST CREEK
IN 06	2005 - 2006	VERMILION RIVER, NORTH
IN 07	2005 - 2006	WHITE RIVER
IN 08	2005 - 2006	WHITEWATER, NOLANS FORK
IN 09	2005 - 2006	RACCOON CREEK
IN 10	2005 - 2006	BRANDYWINE CREEK
IN 11*	2004 - 2006	LITTLE PIGEON CREEK
KY 01	2005 - 2006	BRASHEARS CREEK
KY 02	2005 - 2006	TWOMILE CREEK

Table D.2 Summary of Site Nomenclature for 40 Atrazine Ecological Monitoring Sites		
SITE	**GROUP**	**WATERSHED NAME**
MN 01	2004 - 2005	WHITEWATER NORTH FORK
MO 01*	2004 - 2006	SOUTH FABIOUS RIVER
MO 02	2005 - 2006	YOUNGS CREEK
MO 03*	2004 - 2006	LITTLE SNI-A-BAR CREEK
NE 01	2004 - 2005	WAHOO CREEK
NE 02	2004 - 2005	MIDDLE LOUP CREEK
NE 03	2004 - 2005	PLATTE RIVER
NE 04	2005 - 2006	BIG BLUE RIVER, UPPER GAGE
NE 05	2005 - 2006	MUDDY CREEK (NE)
NE 06	2004 - 2005	CROOKED CREEK
NE 07	2005 - 2006	BIG BLUE RIVER, LOWER GAGE
OH 01	2004 - 2005	KOKOSING RIVER
OH 02	2005 - 2006	LICKING RIVER NORTH FORK
OH 03	2004 - 2005	MAD RIVER
OH 04	2005 - 2006	DEER CREEK
TN 01	2005 - 2006	OBION MIDDLE FORK

* - Sites with an additional third year of sampling

Table D.3 Summary of 2004 to 2006 Atrazine Ecological Monitoring Surface Water Data										
Site	**Year**	**Non Detects**	**Total Samples**	**Frequency of Detection**	**Max Value (µg/l)**	**Min Value (µg/l)**	**Mean Value (µg/l)**	**Median Value (µg/l)**	**Not Analyzed**	**Not Sampled**
IA 01	2004	3	37	91.9	10.03	0.05	0.58	0.20		
IA 01	2005	14	38	63.2	1.21	0.05	0.20	0.12		
IA 02	2004	4	34	88.2	1.76	0.05	0.36	0.16	1	
IA 02	2005	14	39	64.1	5.53	0.05	0.41	0.14		1
IL 01	2004	0	37	100.0	13.18	0.07	1.25	0.64		
IL 01	2005	22	38	42.1	0.63	0.10	0.14	0.10		
IL 02	2004	0	37	100.0	4.86	0.06	0.75	0.39		
IL 02	2005	8	38	78.9	2.93	0.10	0.35	0.16		
IL 03	2005	25	38	34.2	5.63	0.05	0.29	0.10		
IL 03	2006	27	38	28.9	2.46	0.10	0.19	0.10		
IL 04	2005	11	36	69.4	2.80	0.08	0.33	0.14		
IL 04	2006	8	38	78.9	11.50	0.10	0.93	0.26		
IL 05	2004	0	35	100.0	22.13	0.06	0.98	0.27		
IL 05	2005	15	36	58.3	1.83	0.07	0.20	0.11		
IL 06	2004	3	33	90.9	2.20	0.05	0.32	0.20		2
IL 06	2005	29	36	19.4	0.23	0.07	0.11	0.10		
IL 07	2004	3	34	91.2	21.75	0.05	1.15	0.31		
IL 07	2005	7	36	80.6	2.31	0.05	0.30	0.19		
IL 08	2005	0	35	100.0	5.55	0.14	1.04	0.50		
IL 08	2006	4	37	89.2	33.10	0.10	1.94	0.30		

Table D.3 Summary of 2004 to 2006 Atrazine Ecological Monitoring Surface Water Data										
Site	**Year**	**Non Detects**	**Total Samples**	**Frequency of Detection**	**Max Value (µg/l)**	**Min Value (µg/l)**	**Mean Value (µg/l)**	**Median Value (µg/l)**	**Not Analyzed**	**Not Sampled**
IL 09	2004	0	34	100.0	13.25	0.09	2.36	0.99		
IL 09	2005	0	36	100.0	16.02	0.18	1.27	0.55		
IN 01	2004	4	37	89.2	8.63	0.05	1.08	0.30		
IN 01	2005	15	36	58.3	4.38	0.05	0.36	0.13		
IN 02	2004	0	37	100.0	9.31	0.06	1.43	0.49		
IN 02	2005	0	36	100.0	20.33	0.10	1.46	0.44		
IN 03	2005	0	36	100.0	7.62	0.07	1.24	0.63		
IN 03	2006	7	40	82.5	16.90	0.10	1.73	0.46		
IN 04	2004	0	37	100.0	78.08	0.06	2.76	0.43		
IN 04	2005	3	32	90.6	8.78	0.10	0.77	0.24		4
IN 04	2006	9	39	76.9	10.20	0.10	0.99	0.24		
IN 05	2004	0	37	100.0	28.88	0.06	3.13	0.79		
IN 05	2005	1	36	97.2	17.31	0.05	2.37	1.06		
IN 05	2006	7	40	82.5	41.30	0.10	3.15	0.57		
IN 06	2005	15	36	58.3	7.23	0.06	0.47	0.11		
IN 06	2006	11	40	72.5	9.37	0.10	0.96	0.31		
IN 07	2005	5	36	86.1	22.55	0.06	1.76	0.39		
IN 07	2006	15	40	62.5	10.50	0.10	0.83	0.15		
IN 08	2005	5	36	86.1	21.11	0.06	1.33	0.32		
IN 08	2006	6	40	85.0	20.70	0.10	1.83	0.30		
IN 09	2005	1	33	97.0	9.36	0.10	0.93	0.36		3
IN 09	2006	6	40	85.0	8.31	0.10	0.59	0.24		

Table D.3 Summary of 2004 to 2006 Atrazine Ecological Monitoring Surface Water Data										
Site	**Year**	**Non Detects**	**Total Samples**	**Frequency of Detection**	**Max Value (µg/l)**	**Min Value (µg/l)**	**Mean Value (µg/l)**	**Median Value (µg/l)**	**Not Analyzed**	**Not Sampled**
IN 10	2005	2	36	94.4	12.38	0.07	1.44	0.68		
IN 10	2006	8	40	80.0	16.40	0.10	1.55	0.39		
IN 11	2005	0	30	100.0	208.76	0.24	8.44	0.79		6
IN 11	2006	6	40	85.0	9.78	0.10	0.85	0.27		
KY 01	2005	8	35	77.1	2.21	0.05	0.47	0.22		
KY 01	2006	14	36	61.1	22.40	0.10	0.88	0.15		
KY 02	2005	0	32	100.0	19.33	0.42	2.74	1.46		3
KY 02	2006	2	28	92.9	14.30	0.10	1.34	0.49	3	5
MN 01	2005	11	37	70.3	5.85	0.09	0.39	0.12		
MN 01	2006	30	37	18.9	0.22	0.10	0.11	0.10		3
MO 01	2004	0	34	100.0	65.94	0.09	9.47	2.27		
MO 01	2005	0	37	100.0	82.75	0.10	8.03	1.23		
MO 01	2006	5	33	84.8	82.80	0.10	8.25	0.98		2
MO 02	2004	0	34	100.0	53.75	0.14	8.89	4.18		
MO 02	2005	0	36	100.0	28.07	0.74	6.25	3.95		
MO 02	2006	1	35	97.1	43.17	0.10	7.62	2.06		
MO 03	2004	0	34	100.0	59.03	0.60	4.42	2.395		
MO 03	2005	0	33	100.0	12.28	0.12	3.43	2.96		2
MO 03	2006	2	21	90.5	3.94	0.10	1.10	1.07		14
NE 01	2004	3	36	91.7	19.25	0.05	1.96	0.52	2	
NE 01	2005	11	36	69.4	16.66	0.05	1.62	0.25	1	1
NE 02	2005	5	36	86.1	20.72	0.08	2.74	0.34		

Table D.3 Summary of 2004 to 2006 Atrazine Ecological Monitoring Surface Water Data										
Site	**Year**	**Non Detects**	**Total Samples**	**Frequency of Detection**	**Max Value (µg/l)**	**Min Value (µg/l)**	**Mean Value (µg/l)**	**Median Value (µg/l)**	**Not Analyzed**	**Not Sampled**
NE 02	2006	15	40	62.5	82.00	0.10	2.81	0.18		
NE 03	2004	3	38	92.1	2.29	0.05	0.35	0.18		
NE 03	2005	13	37	64.9	11.92	0.05	0.54	0.14		
NE 04	2005	0	22	100.0	49.85	0.13	7.22	0.66		15
NE 04	2006	1	10	90.0	4.12	0.10	0.67	0.18		30
NE 05	2005	2	24	91.7	49.87	0.05	4.67	0.41		13
NE 05	2006	7	15	53.3	6.76	0.10	0.89	0.13		25
NE 06	2004	3	36	91.7	7.74	0.05	1.00	0.17		2
NE 06	2005	11	33	66.7	33.11	0.07	1.83	0.12		4
NE 06	2006	24	27	11.1	0.13	0.10	0.10	0.10		13
NE 07	2005	5	29	82.8	112.19	0.05	7.86	0.61		8
NE 07	2006	2	3	33.3	1.94	0.10	0.71	0.10		37
OH 01	2004	9	38	76.3	18.34	0.05	1.32	0.13		
OH 01	2005	11	35	68.6	3.02	0.05	0.37	0.14		
OH 02	2005	14	35	60.0	18.13	0.12	1.38	0.59		
OH 02	2006	8	40	80.0	14.00	0.10	1.26	0.35		
OH 03	2004	16	38	57.9	21.50	0.05	1.83	0.08		
OH 03	2005	22	35	37.1	8.17	0.05	0.43	0.10		
OH 04	2005	8	35	77.1	20.15	0.08	1.26	0.21		
OH 04	2006	20	40	50.0	6.30	0.10	0.44	0.11		
TN 01	2005	0	34	100.0	7.55	0.21	1.57	0.78		
TN 01	2006	13	35	62.9	10.70	0.10	1.07	0.16		

Table D.3 Summary of 2004 to 2006 Atrazine Ecological Monitoring Surface Water Data										
Site	**Year**	**Non Detects**	**Total Samples**	**Frequency of Detection**	**Max Value (µg/l)**	**Min Value (µg/l)**	**Mean Value (µg/l)**	**Median Value (µg/l)**	**Not Analyzed**	**Not Sampled**
	TOTAL	622	2979	79.1					7	193

Table D.4 Summary of Rolling Averages From Ecological Watershed Monitoring Data for Comparison with Threshold Concentrations

Site	Year	Maximum Peak (µg/l)	Maximum 14-Day Average (µg/l)	Maximum 21-Day Average (µg/l)	Maximum 30-Day Average (µg/l)	Maximum 60-Day Average (µg/l)	Maximum 90-Day Average (µg/l)	Annual Average (µg/l)
IA 01	2004	10.03	3.67	2.64	2.08	1.21	0.87	0.30
IA 01	2005	1.21	0.50	0.40	0.33	0.31	0.27	0.13
IA 02	2004	1.76	1.07	0.96	0.81	0.63	0.50	0.17
IA 02	2005	5.53	2.14	1.53	1.39	0.85	0.63	0.22
IL 01	2004	13.18	6.55	4.98	4.06	2.48	1.87	0.64
IL 01	2005	0.63	0.28	0.23	0.21	0.16	0.15	0.13
IL 02	2004	4.86	2.92	2.62	2.27	1.47	1.10	0.41
IL 02	2005	2.93	1.83	1.36	1.08	0.65	0.50	0.22
IL 03	2005	5.63	1.84	1.30	0.95	0.60	0.43	0.17
IL 03	2006	2.46	0.92	0.67	0.53	0.33	0.25	0.14

Table D.4 Summary of Rolling Averages From Ecological Watershed Monitoring Data for Comparison with Threshold Concentrations								
Site	Year	Maximum Peak (µg/l)	Maximum 14-Day Average (µg/l)	Maximum 21-Day Average (µg/l)	Maximum 30-Day Average (µg/l)	Maximum 60-Day Average (µg/l)	Maximum 90-Day Average (µg/l)	Annual Average (µg/l)
IL 04	2005	2.80	1.36	1.04	0.78	0.48	0.41	0.20
IL 04	2006	11.50	3.44	2.41	1.80	1.75	1.45	0.45
IL 05	2004	22.13	7.17	4.96	3.63	2.04	1.45	0.43
IL 05	2005	1.83	0.68	0.50	0.39	0.30	0.24	0.13
IL 06	2004	2.20	1.07	0.92	0.74	0.53	0.42	0.19
IL 06	2005	0.23	0.15	0.14	0.13	0.12	0.11	0.09
IL 07	2004	21.75	6.95	5.27	4.18	2.36	1.67	0.48
IL 07	2005	2.31	0.93	0.68	0.55	0.49	0.39	0.20
IL 08	2005	5.55	4.45	3.64	2.79	1.79	1.44	0.55
IL 08	2006	33.10	11.05	7.56	8.11	4.42	3.04	0.84
IL 09	2004	13.25	8.06	6.77	6.31	4.57	3.35	1.10
IL 09	2005	16.02	6.36	5.27	4.61	3.85	3.59	1.38
IN 01	2004	8.63	3.99	3.22	3.54	2.37	1.65	0.59
IN 01	2005	4.38	1.37	0.96	1.01	0.67	0.51	0.19
IN 02	2004	9.31	6.32	4.99	4.53	2.84	2.08	0.71

Table D.4 Summary of Rolling Averages From Ecological Watershed Monitoring Data for Comparison with Threshold Concentrations								
Site	Year	Maximum Peak (µg/l)	Maximum 14-Day Average (µg/l)	Maximum 21-Day Average (µg/l)	Maximum 30-Day Average (µg/l)	Maximum 60-Day Average (µg/l)	Maximum 90-Day Average (µg/l)	Annual Average (µg/l)
IN 02	2005	20.33	6.34	4.66	4.34	2.97	2.14	0.69
IN 03	2005	7.62	4.33	3.35	3.34	2.31	1.75	0.60
IN 03	2006	16.90	10.61	7.96	6.20	3.93	2.92	0.83
IN 04	2004	78.08	23.81	16.33	12.05	6.35	4.37	1.20
IN 04	2005	8.78	3.58	2.57	2.09	1.39	1.01	0.38
IN 04	2006	10.20	5.64	4.50	3.70	2.25	1.62	0.48
IN 05	2004	28.88	14.91	15.52	11.92	7.03	4.94	1.39
IN 05	2005	17.31	7.80	5.85	4.49	4.12	3.53	1.04
IN 05	2006	41.30	17.89	14.09	13.09	7.45	5.43	1.47
IN 06	2005	7.23	2.89	2.39	1.80	0.96	0.68	0.24
IN 06	2006	9.37	4.05	3.36	2.70	1.93	1.45	0.47
IN 07	2005	22.55	9.60	7.20	6.38	3.88	2.72	0.75
IN 07	2006	10.50	5.35	4.08	3.60	1.99	1.39	0.42
IN 08	2005	21.11	6.88	5.52	4.94	2.77	2.05	0.57
IN 08	2006	20.70	8.93	7.59	7.66	4.43	3.10	0.86

Table D.4 Summary of Rolling Averages From Ecological Watershed Monitoring Data for Comparison with Threshold Concentrations								
Site	**Year**	**Maximum Peak (µg/l)**	**Maximum 14-Day Average (µg/l)**	**Maximum 21-Day Average (µg/l)**	**Maximum 30-Day Average (µg/l)**	**Maximum 60-Day Average (µg/l)**	**Maximum 90-Day Average (µg/l)**	**Annual Average (µg/l)**
IN 09	2005	9.36	3.69	2.80	2.39	1.69	1.28	0.40
IN 09	2006	8.31	2.97	2.07	1.75	1.24	0.91	0.31
IN 10	2005	12.38	6.10	4.55	4.01	2.83	2.18	0.62
IN 10	2006	16.40	7.50	6.07	6.30	3.56	2.64	0.76
IN 11	2005	208.76	**65.13**	44.41	**31.51**	16.18	11.32	3.33
IN 11	2006	9.78	5.90	4.36	3.34	1.92	1.37	0.46
KY 01	2005	2.21	1.49	1.29	1.25	0.91	0.68	0.23
KY 01	2006	22.40	6.89	4.83	3.58	1.92	1.34	0.41
KY 02	2005	19.33	8.74	8.73	7.07	4.48	3.58	1.33
KY 02	2006	14.30	4.69	4.24	3.87	2.30	1.70	0.62
MN 01	2005	5.85	2.57	1.92	1.41	0.81	0.59	0.22
MN 01	2006	0.22	0.16	0.14	0.13	0.12	0.11	0.10
MO 01	2004	65.94	**39.64**	29.60	**28.59**	**19.39**	**13.85**	3.88
MO 01	2005	182.75	**78.06**	54.19	**42.52**	**25.74**	**17.85**	4.63
MO 01	2006	82.80	**48.23**	41.13	**31.65**	17.46	**12.00**	3.18

Table D.4 Summary of Rolling Averages From Ecological Watershed Monitoring Data for Comparison with Threshold Concentrations								
Site	**Year**	**Maximum Peak (µg/l)**	**Maximum 14-Day Average (µg/l)**	**Maximum 21-Day Average (µg/l)**	**Maximum 30-Day Average (µg/l)**	**Maximum 60-Day Average (µg/l)**	**Maximum 90-Day Average (µg/l)**	**Annual Average (µg/l)**
MO 02	2004	53.75	33.04	29.74	25.87	16.76	**12.33**	4.12
MO 02	2005	28.07	18.68	17.03	14.62	11.46	9.11	3.62
MO 02	2006	43.17	34.69	31.55	**27.38**	15.42	11.53	3.26
MO 03	2004	59.03	23.27	17.17	13.14	8.14	6.11	2.16
MO 03	2005	12.28	8.70	7.54	6.93	5.52	4.41	1.64
MO 03	2006	3.94	2.31	2.04	1.94	1.50	1.28	0.76
NE 01	2004	19.25	13.02	9.79	7.51	4.29	3.04	0.81
NE 01	2005	16.66	6.56	5.19	5.65	3.65	2.53	0.69
NE 02	2005	20.72	11.41	11.83	10.68	6.28	4.30	1.14
NE 02	2006	82.00	28.63	19.53	14.13	7.26	4.95	1.29
NE 03	2004	2.29	1.10	1.23	0.97	0.65	0.51	0.21
NE 03	2005	11.92	3.69	2.54	2.08	1.15	0.82	0.26
NE 04	2005	36.00	36.00	34.75	**27.28**	17.42	11.92	3.07
NE 04	2006	4.12	4.12	3.99	3.11	1.66	1.16	0.38
NE 05	2005	49.87	23.83	23.30	19.87	16.50	11.35	2.88

Table D.4 Summary of Rolling Averages From Ecological Watershed Monitoring Data for Comparison with Threshold Concentrations								
Site	**Year**	**Maximum Peak (µg/l)**	**Maximum 14-Day Average (µg/l)**	**Maximum 21-Day Average (µg/l)**	**Maximum 30-Day Average (µg/l)**	**Maximum 60-Day Average (µg/l)**	**Maximum 90-Day Average (µg/l)**	**Annual Average (µg/l)**
NE 05	2006	6.76	6.76	6.76	6.76	5.09	3.49	0.94
NE 06	2004	7.74	2.76	2.78	2.14	1.70	1.55	0.45
NE 06	2005	33.11	20.59	13.87	11.45	6.03	4.08	1.08
NE 06	2006	0.13	0.11	0.11	0.10	0.10	0.10	0.10
NE 07	2005	112.19	**79.98**	61.92	**45.17**	**22.66**	16.62	4.53
NE 07	2006	***	***	***	***	***	***	***
OH 01	2004	18.34	8.80	7.71	5.72	3.19	2.18	0.60
OH 01	2005	3.02	0.99	0.73	0.86	0.55	0.52	0.19
OH 02	2005	18.13	7.13	5.12	4.03	2.91	2.11	0.63
OH 02	2006	14.00	5.93	5.76	5.20	2.89	2.08	0.61
OH 03	2004	21.50	9.07	8.12	7.33	4.46	3.00	0.78
OH 03	2005	8.17	2.99	2.10	1.63	0.89	0.63	0.22
OH 04	2005	20.15	7.96	5.72	4.70	2.74	1.90	0.54
OH 04	2006	6.30	2.57	2.30	1.73	1.01	0.72	0.25
TN 01	2005	7.55	5.60	4.84	4.02	2.93	2.21	0.81

Table D.4 Summary of Rolling Averages From Ecological Watershed Monitoring Data for Comparison with Threshold Concentrations								
Site	**Year**	**Maximum Peak (µg/l)**	**Maximum 14-Day Average (µg/l)**	**Maximum 21-Day Average (µg/l)**	**Maximum 30-Day Average (µg/l)**	**Maximum 60-Day Average (µg/l)**	**Maximum 90-Day Average (µg/l)**	**Annual Average (µg/l)**
TN 01	2006	10.70	3.62	3.06	2.45	1.95	1.65	0.58
Minimum		0.13	0.11	0.11	0.10	0.10	0.10	0.09
Mean		22.08	10.61	8.47	6.96	4.29	3.11	0.94
Maximum		208.76	79.98	61.92	45.17	25.74	17.85	4.63
CASM Thresholds			**38.00**		**27.00**	**18.00**	**12.00**	

Table D.5 Summary of Number of Watersheds from Ecological Monitoring Data that Exceed PRZM Flow-Adjusted EECs							
Region	**Flow (ft^3/sed)**	**Peak Concentration (µg/L)**	**14-Day Average Concentration (µg/L)**	**21-Day Average Concentration (µg/L)**	**30-Day Average Concentration (µg/L)**	**60-Day Average Concentration (µg/L)**	**90-Day Average Concentration (µg/L)**
South	105	120	15	10	7	3	2
North	22	69	17	13	8	4	**3**
West	90	74	7	5	4	2	1
East	110	68	10	6	4	2	2
	Sites Above Lowest Flowing EEC	5	11	10	12	17	17
	Sites 2 times above lowest flowing EEC	2	5	5	5	7	7
	Sites 3 times above lowest flowing EEC	1	3	3	5	6	6

Table D.6 Comparison of Flow Rate and Ecological Monitoring Sites Above Flow-Adjusted Modeling										
				Grab Sample Rolling Averages						
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14-Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
NE 07	**2006**	0.2	**7.1**	***	***	***	***	***	***	***
MO 01	**2005**	0.1	**3.5**	**182.75**	**78.06**	**54.19**	**42.52**	**25.74**	**17.85**	4.63
NE 07	**2005**	0.4	**14.1**	**112.19**	**79.98**	**61.92**	**45.17**	**22.66**	**16.62**	4.53
MO 01	**2004**	0.1	**3.5**	**65.94**	**39.64**	**29.60**	**28.59**	**19.39**	**13.85**	3.88
MO 02	**2004**	0.8	**28.2**	53.75	**33.04**	**29.74**	**25.87**	**16.76**	**12.33**	4.12
MO 01	**2006**	0.1	**3.5**	**82.80**	**48.23**	**41.13**	**31.65**	**17.46**	**12.00**	3.18
NE 04	**2005**	0.3	**10.6**	36.00	**36.00**	**34.75**	**27.28**	**17.42**	**11.92**	3.07
MO 02	**2006**	0.8	**28.2**	43.17	**34.69**	**31.55**	**27.38**	**15.42**	**11.53**	3.26
NE 05	**2005**	0.9	**31.8**	49.87	**23.83**	**23.30**	**19.87**	**16.50**	**11.35**	2.88
IN 11	**2005**	0.3	**10.6**	**208.76**	**65.13**	**44.41**	**31.51**	**16.18**	**11.32**	3.33
MO 02	**2005**	0.7	**24.7**	28.07	**18.68**	**17.03**	**14.62**	**11.46**	**9.11**	3.62
MO 03	**2004**	2.4	**84.7**	59.03	**23.27**	**17.17**	**13.14**	**8.14**	**6.11**	2.16
NE 02	**2006**	1.0	**35.3**	**82.00**	**28.63**	**19.53**	**14.13**	**7.26**	**4.95**	1.29
IN 05	**2004**	0.2	**7.1**	28.88	14.91	**15.52**	**11.92**	**7.03**	**4.94**	1.39

Table D.6 Comparison of Flow Rate and Ecological Monitoring Sites Above Flow-Adjusted Modeling										
					Grab Sample Rolling Averages					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14-Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
MO 03	**2005**	2.0	**70.6**	12.28	8.70	7.54	6.93	**5.52**	**4.41**	1.64
IN 04	**2004**	1.2	**42.4**	**78.08**	**23.81**	**16.33**	**12.05**	**6.35**	**4.37**	1.20
NE 02	**2005**	2.0	**70.6**	20.72	11.41	11.83	**10.68**	**6.28**	**4.30**	1.14
NE 06	**2005**	0.0	**1.1**	33.11	**20.59**	**13.87**	**11.45**	**6.03**	**4.08**	1.08
IL 09	**2005**	0.7	**24.7**	16.02	6.36	5.27	4.61	3.85	**3.59**	1.38
KY 02	**2005**	1.5	**53.0**	19.33	8.74	8.73	7.07	**4.48**	**3.58**	1.33
IN 05	**2005**	0.2	**7.1**	17.31	7.80	5.85	4.49	**4.12**	**3.53**	1.04
NE 05	**2006**	0.7	**24.7**	6.76	6.76	6.76	6.76	**5.09**	**3.49**	0.94
IL 09	**2004**	0.9	**31.8**	13.25	8.06	6.77	6.31	**4.57**	**3.35**	1.10
IN 08	**2006**	1.0	**35.3**	20.70	8.93	7.59	7.66	**4.43**	**3.10**	0.86
NE 01	**2004**	1.2	**42.4**	19.25	13.02	9.79	7.51	**4.29**	**3.04**	0.81
IL 08	**2006**	4.0	**141.2**	33.10	11.05	7.56	**8.11**	**4.42**	**3.04**	0.84
OH 03	**2004**	0.6	**21.2**	21.50	9.07	8.12	7.33	**4.46**	3.00	0.78
IN 03	2006	1.0	35.3	16.90	10.61	7.96	6.20	3.93	2.92	0.83
IN 07	2005	0.6	21.2	22.55	9.60	7.20	6.38	3.88	2.72	0.75

Table D.6 Comparison of Flow Rate and Ecological Monitoring Sites Above Flow-Adjusted Modeling										
					Grab Sample Rolling Averages					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14-Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IN 10	2006	0.7	24.7	16.40	7.50	6.07	6.30	3.56	2.64	0.76
NE 01	2005	2.5	88.3	16.66	6.56	5.19	5.65	3.65	2.53	0.69
TN 01	2005	0.5	17.7	7.55	5.60	4.84	4.02	2.93	2.21	0.81
IN 10	2005	0.4	14.1	12.38	6.10	4.55	4.01	2.83	2.18	0.62
OH 01	2004	1.0	35.3	18.34	8.80	7.71	5.72	3.19	2.18	0.60
IN 02	2005	0.3	10.6	20.33	6.34	4.66	4.34	2.97	2.14	0.69
OH 02	2005	0.9	31.8	18.13	7.13	5.12	4.03	2.91	2.11	0.63
IN 02	2004	0.9	31.8	9.31	6.32	4.99	4.53	2.84	2.08	0.71
OH 02	2006	1.0	35.3	14.00	5.93	5.76	5.20	2.89	2.08	0.61
IN 08	2005	0.8	28.2	21.11	6.88	5.52	4.94	2.77	2.05	0.57
OH 04	2005	5.0	176.5	20.15	7.96	5.72	4.70	2.74	1.90	0.54
IL 01	2004	2.9	102.4	13.18	6.55	4.98	4.06	2.48	1.87	0.64
IN 03	2005	0.5	17.7	7.62	4.33	3.35	3.34	2.31	1.75	0.60
KY 02	2006	2.0	70.6	14.30	4.69	4.24	3.87	2.30	1.70	0.62
IL 07	2004	0.8	28.2	21.75	6.95	5.27	4.18	2.36	1.67	0.48

Table D.6 Comparison of Flow Rate and Ecological Monitoring Sites Above Flow-Adjusted Modeling										
					Grab Sample Rolling Averages					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14-Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IN 01	2004	1.8	63.5	8.63	3.99	3.22	3.54	2.37	1.65	0.59
TN 01	2006	0.5	17.7	10.70	3.62	3.06	2.45	1.95	1.65	0.58
NE 06	2004	0.1	3.5	7.74	2.76	2.78	2.14	1.70	1.55	0.45
IN 06	2006	5.0	176.5	9.37	4.05	3.36	2.70	1.93	1.45	0.47
IL 04	2006	3.0	105.9	11.50	3.44	2.41	1.80	1.75	1.45	0.45
IL 05	2004	2.9	102.4	22.13	7.17	4.96	3.63	2.04	1.45	0.43
IL 08	2005	4.0	141.2	5.55	4.45	3.64	2.79	1.79	1.44	0.55
IN 07	2006	5.0	176.5	10.50	5.35	4.08	3.60	1.99	1.39	0.42
IN 11	2006	1.0	35.3	9.78	5.90	4.36	3.34	1.92	1.37	0.46
KY 01	2006	0.4	14.1	22.40	6.89	4.83	3.58	1.92	1.34	0.41
MO 03	2006	2.0	70.6	3.94	2.31	2.04	1.94	1.50	1.28	0.76
IN 09	2005	1.5	53.0	9.36	3.69	2.80	2.39	1.69	1.28	0.40
NE 04	2006	0.2	7.1	4.12	4.12	3.99	3.11	1.66	1.16	0.38
IL 02	2004	2.0	70.6	4.86	2.92	2.62	2.27	1.47	1.10	0.41
IN 04	2005	0.2	7.1	8.78	3.58	2.57	2.09	1.39	1.01	0.38

Table D.6 Comparison of Flow Rate and Ecological Monitoring Sites Above Flow-Adjusted Modeling										
					Grab Sample Rolling Averages					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14-Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IN 09	2006	2.0	70.6	8.31	2.97	2.07	1.75	1.24	0.91	0.31
IA 01	2004	1.4	49.4	10.03	3.67	2.64	2.08	1.21	0.87	0.30
NE 03	2005	0.1	3.5	11.92	3.69	2.54	2.08	1.15	0.82	0.26
OH 04	2006	5.0	176.5	6.30	2.57	2.30	1.73	1.01	0.72	0.25
IN 06	2005	4.0	141.2	7.23	2.89	2.39	1.80	0.96	0.68	0.24
KY 01	2005	0.2	7.1	2.21	1.49	1.29	1.25	0.91	0.68	0.23
IA 02	2005	0.6	21.2	5.53	2.14	1.53	1.39	0.85	0.63	0.22
OH 03	2005	0.5	17.7	8.17	2.99	2.10	1.63	0.89	0.63	0.22
MN 01	2005	0.9	31.8	5.85	2.57	1.92	1.41	0.81	0.59	0.22
OH 01	2005	0.7	24.7	3.02	0.99	0.73	0.86	0.55	0.52	0.19
NE 03	2004	0.1	3.5	2.29	1.10	1.23	0.97	0.65	0.51	0.21
IN 01	2005	4.0	141.2	4.38	1.37	0.96	1.01	0.67	0.51	0.19
IA 02	2004	0.6	21.2	1.76	1.07	0.96	0.81	0.63	0.50	0.17
IL 02	2005	1.5	53.0	2.93	1.83	1.36	1.08	0.65	0.50	0.22
IL 03	2005	1.5	53.0	5.63	1.84	1.30	0.95	0.60	0.43	0.17

Table D.6 Comparison of Flow Rate and Ecological Monitoring Sites Above Flow-Adjusted Modeling										
					Grab Sample Rolling Averages					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14-Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IL 06	2004	0.9	31.8	2.20	1.07	0.92	0.74	0.53	0.42	0.19
IL 04	2005	0.6	21.2	2.80	1.36	1.04	0.78	0.48	0.41	0.20
IL 07	2005	0.6	21.2	2.31	0.93	0.68	0.55	0.49	0.39	0.20
IA 01	2005	2.0	70.6	1.21	0.50	0.40	0.33	0.31	0.27	0.13
IL 03	2006	1.0	35.3	2.46	0.92	0.67	0.53	0.33	0.25	0.14
IL 05	2005	2.0	70.6	1.83	0.68	0.50	0.39	0.30	0.24	0.13
IL 01	2005	0.5	17.7	0.63	0.28	0.23	0.21	0.16	0.15	0.13
MN 01	2006	0.5	17.7	0.22	0.16	0.14	0.13	0.12	0.11	0.10
IL 06	2005	0.6	21.2	0.23	0.15	0.14	0.13	0.12	0.11	0.09
NE 06	2006	0.0	1.1	0.13	0.11	0.11	0.10	0.10	0.10	0.10

1 - Sites in bold represent sites where one or more rolling average is above the equivalent flow-adjusted rolling average EEC
*** - Insufficient data to estimate rolling averages

Table D.7 Comparison of Flow Rate and Ecological Monitoring Sites Greater than Two Times Above Flow-Adjusted Modeling

				Grab Sample Rolling Averages (ppb)						
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14 -Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
NE 07[1]	**2006**	0.2	**7.1**	***	***	***	***	***	***	***
MO 01	**2005**	0.1	**3.5**	**182.75**	**78.06**	**54.19**	**42.52**	**25.74**	**17.85**	4.63
NE 07	**2005**	0.4	**14.1**	112.19	**79.98**	**61.92**	**45.17**	**22.66**	**16.62**	4.53
MO 01	**2004**	0.1	**3.5**	65.94	**39.64**	**29.60**	**28.59**	**19.39**	**13.85**	3.88
MO 02	**2004**	0.8	**28.2**	53.75	**33.04**	**29.74**	**25.87**	**16.76**	**12.33**	4.12
MO 01	**2006**	0.1	**3.5**	82.80	**48.23**	**41.13**	**31.65**	**17.46**	**12.00**	3.18
NE 04	**2005**	0.3	**10.6**	36.00	**36.00**	**34.75**	**27.28**	**17.42**	**11.92**	3.07
MO 02	**2006**	0.8	**28.2**	43.17	**34.69**	**31.55**	**27.38**	**15.42**	**11.53**	3.26
NE 05	**2005**	0.9	**31.8**	49.87	23.83	23.30	**19.87**	**16.50**	**11.35**	2.88
IN 11	**2005**	0.3	**10.6**	**208.76**	**65.13**	**44.41**	**31.51**	**16.18**	**11.32**	3.33
MO 02	**2005**	0.7	**24.7**	28.07	18.68	17.03	14.62	**11.46**	**9.11**	3.62
MO 03	**2004**	2.4	**84.7**	59.03	23.27	17.17	13.14	**8.14**	**6.11**	2.16
NE 02	2006	1.0	35.3	82.00	28.63	19.53	14.13	7.26	4.95	1.29
IN 05	2004	0.2	7.1	28.88	14.91	15.52	11.92	7.03	4.94	1.39

Table D.7 Comparison of Flow Rate and Ecological Monitoring Sites Greater than Two Times Above Flow-Adjusted Modeling

					Grab Sample Rolling Averages (ppb)					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14 -Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
MO 03	2005	2.0	70.6	12.28	8.70	7.54	6.93	5.52	4.41	1.64
IN 04	2004	1.2	42.4	78.08	23.81	16.33	12.05	6.35	4.37	1.20
NE 02	2005	2.0	70.6	20.72	11.41	11.83	10.68	6.28	4.30	1.14
NE 06	2005	0.0	1.1	33.11	20.59	13.87	11.45	6.03	4.08	1.08
IL 09	2005	0.7	24.7	16.02	6.36	5.27	4.61	3.85	3.59	1.38
KY 02	2005	1.5	53.0	19.33	8.74	8.73	7.07	4.48	3.58	1.33
IN 05	2005	0.2	7.1	17.31	7.80	5.85	4.49	4.12	3.53	1.04
NE 05	2006	0.7	24.7	6.76	6.76	6.76	6.76	5.09	3.49	0.94
IL 09	2004	0.9	31.8	13.25	8.06	6.77	6.31	4.57	3.35	1.10
IN 08	2006	1.0	35.3	20.70	8.93	7.59	7.66	4.43	3.10	0.86
NE 01	2004	1.2	42.4	19.25	13.02	9.79	7.51	4.29	3.04	0.81
IL 08	2006	4.0	141.2	33.10	11.05	7.56	8.11	4.42	3.04	0.84
OH 03	2004	0.6	21.2	21.50	9.07	8.12	7.33	4.46	3.00	0.78
IN 03	2006	1.0	35.3	16.90	10.61	7.96	6.20	3.93	2.92	0.83
IN 07	2005	0.6	21.2	22.55	9.60	7.20	6.38	3.88	2.72	0.75

Table D.7 Comparison of Flow Rate and Ecological Monitoring Sites Greater than Two Times Above Flow-Adjusted Modeling

					Grab Sample Rolling Averages (ppb)					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14 -Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IN 10	2006	0.7	24.7	16.40	7.50	6.07	6.30	3.56	2.64	0.76
NE 01	2005	2.5	88.3	16.66	6.56	5.19	5.65	3.65	2.53	0.69
TN 01	2005	0.5	17.7	7.55	5.60	4.84	4.02	2.93	2.21	0.81
IN 10	2005	0.4	14.1	12.38	6.10	4.55	4.01	2.83	2.18	0.62
OH 01	2004	1.0	35.3	18.34	8.80	7.71	5.72	3.19	2.18	0.60
IN 02	2005	0.3	10.6	20.33	6.34	4.66	4.34	2.97	2.14	0.69
OH 02	2005	0.9	31.8	18.13	7.13	5.12	4.03	2.91	2.11	0.63
IN 02	2004	0.9	31.8	9.31	6.32	4.99	4.53	2.84	2.08	0.71
OH 02	2006	1.0	35.3	14.00	5.93	5.76	5.20	2.89	2.08	0.61
IN 08	2005	0.8	28.2	21.11	6.88	5.52	4.94	2.77	2.05	0.57
OH 04	2005	5.0	176.5	20.15	7.96	5.72	4.70	2.74	1.90	0.54
IL 01	2004	2.9	102.4	13.18	6.55	4.98	4.06	2.48	1.87	0.64
IN 03	2005	0.5	17.7	7.62	4.33	3.35	3.34	2.31	1.75	0.60
KY 02	2006	2.0	70.6	14.30	4.69	4.24	3.87	2.30	1.70	0.62
IL 07	2004	0.8	28.2	21.75	6.95	5.27	4.18	2.36	1.67	0.48

Table D.7 Comparison of Flow Rate and Ecological Monitoring Sites Greater than Two Times Above Flow-Adjusted Modeling

					Grab Sample Rolling Averages (ppb)					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14 -Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IN 01	2004	1.8	63.5	8.63	3.99	3.22	3.54	2.37	1.65	0.59
TN 01	2006	0.5	17.7	10.70	3.62	3.06	2.45	1.95	1.65	0.58
NE 06	2004	0.1	3.5	7.74	2.76	2.78	2.14	1.70	1.55	0.45
IN 06	2006	5.0	176.5	9.37	4.05	3.36	2.70	1.93	1.45	0.47
IL 04	2006	3.0	105.9	11.50	3.44	2.41	1.80	1.75	1.45	0.45
IL 05	2004	2.9	102.4	22.13	7.17	4.96	3.63	2.04	1.45	0.43
IL 08	2005	4.0	141.2	5.55	4.45	3.64	2.79	1.79	1.44	0.55
IN 07	2006	5.0	176.5	10.50	5.35	4.08	3.60	1.99	1.39	0.42
IN 11	2006	1.0	35.3	9.78	5.90	4.36	3.34	1.92	1.37	0.46
KY 01	2006	0.4	14.1	22.40	6.89	4.83	3.58	1.92	1.34	0.41
MO 03	2006	2.0	70.6	3.94	2.31	2.04	1.94	1.50	1.28	0.76
IN 09	2005	1.5	53.0	9.36	3.69	2.80	2.39	1.69	1.28	0.40
NE 04	2006	0.2	7.1	4.12	4.12	3.99	3.11	1.66	1.16	0.38
IL 02	2004	2.0	70.6	4.86	2.92	2.62	2.27	1.47	1.10	0.41
IN 04	2005	0.2	7.1	8.78	3.58	2.57	2.09	1.39	1.01	0.38

Table D.7 Comparison of Flow Rate and Ecological Monitoring Sites Greater than Two Times Above Flow-Adjusted Modeling

					Grab Sample Rolling Averages (ppb)					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14 -Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IN 09	2006	2.0	70.6	8.31	2.97	2.07	1.75	1.24	0.91	0.31
IA 01	2004	1.4	49.4	10.03	3.67	2.64	2.08	1.21	0.87	0.30
NE 03	2005	0.1	3.5	11.92	3.69	2.54	2.08	1.15	0.82	0.26
OH 04	2006	5.0	176.5	6.30	2.57	2.30	1.73	1.01	0.72	0.25
IN 06	2005	4.0	141.2	7.23	2.89	2.39	1.80	0.96	0.68	0.24
KY 01	2005	0.2	7.1	2.21	1.49	1.29	1.25	0.91	0.68	0.23
IA 02	2005	0.6	21.2	5.53	2.14	1.53	1.39	0.85	0.63	0.22
OH 03	2005	0.5	17.7	8.17	2.99	2.10	1.63	0.89	0.63	0.22
MN 01	2005	0.9	31.8	5.85	2.57	1.92	1.41	0.81	0.59	0.22
OH 01	2005	0.7	24.7	3.02	0.99	0.73	0.86	0.55	0.52	0.19
NE 03	2004	0.1	3.5	2.29	1.10	1.23	0.97	0.65	0.51	0.21
IN 01	2005	4.0	141.2	4.38	1.37	0.96	1.01	0.67	0.51	0.19
IA 02	2004	0.6	21.2	1.76	1.07	0.96	0.81	0.63	0.50	0.17
IL 02	2005	1.5	53.0	2.93	1.83	1.36	1.08	0.65	0.50	0.22
IL 03	2005	1.5	53.0	5.63	1.84	1.30	0.95	0.60	0.43	0.17

Table D.7 Comparison of Flow Rate and Ecological Monitoring Sites Greater than Two Times Above Flow-Adjusted Modeling

					Grab Sample Rolling Averages (ppb)					
Site	**Year**	**Average Flow (m^3/s)**	**Average Flow (ft^3/s)**	**Max Peak (ppb)**	**Max 14 -Day (ppb)**	**Max 21-Day (ppb)**	**Max 30-Day (ppb)**	**Max 60-Day (ppb)**	**Max 90-Day (ppb)**	**Annual Average (ppb)**
IL 06	2004	0.9	31.8	2.20	1.07	0.92	0.74	0.53	0.42	0.19
IL 04	2005	0.6	21.2	2.80	1.36	1.04	0.78	0.48	0.41	0.20
IL 07	2005	0.6	21.2	2.31	0.93	0.68	0.55	0.49	0.39	0.20
IA 01	2005	2.0	70.6	1.21	0.50	0.40	0.33	0.31	0.27	0.13
IL 03	2006	1.0	35.3	2.46	0.92	0.67	0.53	0.33	0.25	0.14
IL 05	2005	2.0	70.6	1.83	0.68	0.50	0.39	0.30	0.24	0.13
IL 01	2005	0.5	17.7	0.63	0.28	0.23	0.21	0.16	0.15	0.13
MN 01	2006	0.5	17.7	0.22	0.16	0.14	0.13	0.12	0.11	0.10
IL 06	2005	0.6	21.2	0.23	0.15	0.14	0.13	0.12	0.11	0.09
NE 06	2006	0.0	1.1	0.13	0.11	0.11	0.10	0.10	0.10	0.10

1 - Sites in bold represent sites where one or more rolling average is above the equivalent flow-adjusted rolling average EEC

*** - Insufficient data to estimate rolling averages

Table D.8 Comparison of Results from Targeted and Non-Targeted Monitoring Data							
All Ecological Stream Monitoring Site Percentiles							
Percentile	**Max Peak (ppb)**	**Max 14-day (ppb)**	**Max 21-day (ppb)**	**Max 30-day (ppb)**	**Max 60-day (ppb)**	**Max 90-day (ppb)**	**Annual Average (ppb)**
Max Value	208.8	80.0	61.9	45.2	25.7	17.8	4.6
99 th Percentile	187.4	78.4	55.6	43.0	23.2	16.8	4.6
95 th Percentile	81.6	39.3	34.4	28.5	17.3	11.9	3.6
90 th Percentile	48.5	23.8	19.1	14.5	10.8	8.5	2.7
75 th Percentile	20.7	8.9	7.6	6.8	4.5	3.4	1.1
50 th Percentile	10.5	5.6	4.4	3.6	2.3	1.7	0.6
25 th Percentile	5.6	2.7	2.1	1.7	1.0	0.7	0.2
10 th Percentile	2.2	1.0	0.8	0.7	0.5	0.4	0.2
5 th Percentile	1.3	0.5	0.4	0.3	0.3	0.2	0.1
Heidelberg Monitoring Data (Sandusky)							
		14-day	**21-day (ppb)**	**30-day (ppb)**	**60-day (ppb)**	**90-day (ppb)**	
Maximum Value		28.26	21.11	18.3	12.38	8.89	
90th Percentile		7.55	7.08	7.82	10.23	8.22	
USGS NAWQA DATA							

Table D.8 Comparison of Results from Targeted and Non-Targeted Monitoring Data		
Percentile	**Peak (ppb)**	**TWM (ppb)**
Max Value	201	9.6
99 th Percentile	195.9	8.7
95 th Percentile	132.15	6.0
90 th Percentile	108	4.5
75 th Percentile	28.725	2.7
50 th Percentile	17.2	1.4
25 th Percentile	10.375	0.8
10 th Percentile	3.857	0.7
5 th Percentile	2.4945	0.4
Heidelberg (Sandusky Watershed)		
	Peak (ppb)	**TWM (ppb)**
Max Value	53.21	3.32
99 th Percentile	51.1812	3.1344
95 th Percentile	43.066	2.392
90 th Percentile	40.23	2.04
75 th Percentile	24.61	1.76

Table D.8 Comparison of Results from Targeted and Non-Targeted Monitoring Data			
50 th Percentile	19.31		1.49
25 th Percentile	15.46		1.27
10 th Percentile	8.426		0.68
5 th Percentile	6.682		0.406
Heidelberg (Maumee Watershed)			
	Peak (ppb)		**TWM (ppb)**
Max Value	38.74		2.09
99 th Percentile	36.9608		2.08264
95 th Percentile	29.844		2.0532
90 th Percentile	24.644		1.9456
75 th Percentile	19.37		1.69
50 th Percentile	11.71		1.27
25 th Percentile	7.35		1
10 th Percentile	4.86		0.696
5 th Percentile	3.646		0.494

D.3 USGS NAWQA Data

An analysis of the entire USGS NAWQA data set for atrazine was completed. A data download was conducted from the USGS data warehouse (http://water.usgs.gov/nawqa). Overall, a total of 20,812 samples were analyzed for atrazine. Of these, 16,742 samples had positive detections (including estimated values) yielding a frequency of detection of roughly 80%. The maximum detection from all samples was 201 µg/L from the Bogue Chitto Creek in Alabama near Memphis in 1999. However, Bogue Chitto Creek is located outside of the action area boundary for the pallid sturgeon. Overall, the average concentration detected was 0.26 µg/L when considering only detections and 0.21 µg/L when considering all detections and non-detections (using the detection limit as the value for estimation). The locations of all NAWQA surface water sites relative to the action area and the targeted monitoring data are shown in **Figure D.1**.

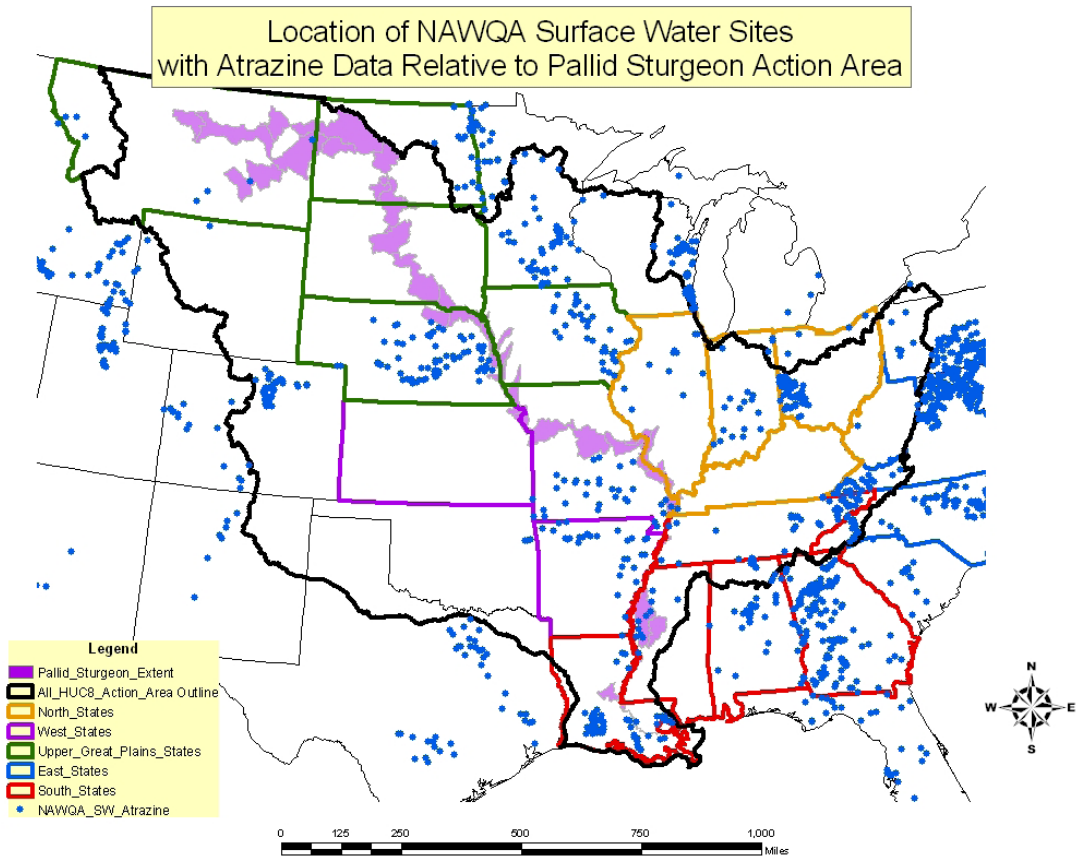

Figure D.1 All USGS NAWQA Sites Relative to Action Area

The top ten sites with the highest atrazine concentrations from the national NAWQA data were selected for refined analysis of the detections. All values from the national data set were ranked and the top ten sites were selected based on maximum concentration. Each

location was analyzed separately by year, and the annual maximum and annual time weighted mean concentrations were calculated.

Generally, the maximum (peak) concentrations from the USGS NAWQA data are consistent with peak concentrations observed from the targeted monitoring data, roughly two times less than the values predicted using both the static water body, and two times higher than the flow-adjusted EECs. The time weighted mean (TWM) values from this analysis are roughly an order of magnitude below the static water body model predictions, two times above those estimated in the refined flow-adjusted EECs, and consistent with the targeted monitoring data. This analysis is somewhat biased because the selected USGS NAWQA data represent those sites with the highest concentrations and the majority of the sampling locations are within the same geographic extent as the targeted data – the 1,172 vulnerable watersheds. In reality, there are many more NAWQA sites within and outside the action area (Figure D.1) with atrazine detections expected to have lower concentrations (peak and annual average) than those reported for the top ten sites. Also of note is that there appears to be a general downward trend in atrazine exposures over time in these data (e.g., Bogue Chitto Creek), although some exceptions are noted (e.g., Sugar Creek, IL). Downward trends in exposure over time are expected, given the label changes that have reduced application rates and implemented setbacks in the 1990s. Comparison of these data with modeled predictions for the intermediate duration exposures (14-day, 30-day, etc.) was not conducted because the NAWQA data generally do not have the frequency needed to conduct a meaningful interpolation between data points. Table D.9 presents a summary of the annual time weighted mean concentrations, and Table D.10 presents a summary of the annual maximum concentrations for the ten sites with the highest atrazine detections.

Table D.9 Annualized Time Weighted Mean (TWM) Concentration (µg/L) for the Top Ten NAWQA Surface Water Sites (Ranked by Maximum Concentration Detected)									
	Station Name (ID)								
Year	Bogue Chitto Creek, near Memphis, TN (02444490)	Tributary to S Fork Dry Creek, near Schuyler, NE (06799750)	Sugar Creek, New Palestine, IN (394340085524601)	Kessinger Ditch, near Monroe City, IN (03360895)	LaMoine River @ Colmar, IL (05584500)	Sugar Creek @ Milford, IL (05525500)	Tensas River @ Tendal, LA (07369500)	Maple Creek near Nickerson, NE (06800000)	Auglaize River near Ft Jennings, OH (04186500)
1992			0.98					1.32	
1993			0.77	3.80				1.43	
1994			0.87	2.56					
1995			2.28	0.74					
1996			1.30				4.32		2.18
1997			5.36		3.45		5.55	1.03	2.82
1998			0.82		1.79		2.94	1.21	1.88
1999	9.62		0.28				2.50	0.68	
2000	6.49		0.56			1.26		0.15	
2001	1.20		0.83			0.78		0.22	1.28
2002	2.88		0.51			2.22		1.26	0.80
2003	2.14	4.46	0.70			7.83		2.23	1.42
2004	1.77	68.78[a]	0.67			1.24		3.31	1.93

[a] TWM concentration likely biased because the first sample on May 8 is the peak sample from this year.

Table D.10 Maximum Concentration (µg/L) for the Top Ten NAWQA Surface Water Sites (Ranked by Maximum Concentration Detected)									
	Station Name (ID)								
Year	Bogue Chitto Creek, near Memphis, TN (02444490)	Tributary to S Fork Dry Creek, near Schuyler, NE (06799750)	Sugar Creek, New Palestine, IN (394340085524601)	Kessinger Ditch, near Monroe City, IN (03360895)	LaMoine River @ Colmar, IL (05584500)	Sugar Creek @ Milford, IL (05525500)	Tensas River @ Tendal, LA (07369500)	Maple Creek near Nickerson, NE (06800000)	Auglaize River near Ft Jennings, OH (04186500)
1992			14					25	
1993			8.5	120				11.2	
1994			11	24					
1995			27	2.6					
1996			14.2				30		18
1997			129		108		92.3	10.3	85.2
1998			7.88		27.7		19.3	30	9.96
1999	201		2.39				13.9	10.7	
2000	136		3.84			23		0.87	
2001	4.5		14.4			6.96		1.21	10.4
2002	24.8		4.01			21.3		16.4	2.58
2003	18.8	21.3	10.5			108		34.8	13.4
2004	14.6	191	28.3			10.9		91.9	18.7

D.4 Heidelberg College Data

Data from Heidelberg College, which consists of two intensively sampled watersheds (Maumee and Sandusky) in Ohio, were also analyzed. These sample sites are on the extreme northern edge of the action area and are also included in this analysis to provide context to the modeled exposures. It appears that the Sandusky watershed is within the boundary of the vulnerable watersheds included in the targeted monitoring study, while the Maumee watershed is outside this boundary. More information on the water quality monitoring program at Heidelberg College may be found at the following website:

http://wql-data.heidelberg.edu/

The Heidelberg data were collected more frequently than other data included in this assessment. The study design was specifically established to capture peak and longer-term trends in pesticide exposures. Data were collected between 1983 and 1999 and consist of an average of roughly 100 samples per year with several days of multiple sampling.

For the Sandusky watershed, a total of 1,597 samples were collected with 1,444 detections of atrazine (90.4% frequency of detection). The maximum concentration detected in the Sandusky watershed was 52.2 µg/L, and the overall average concentration was 4.5 µg/L. For the Maumee watershed, a total of 1,437 samples were collected with 1,305 detections of atrazine (90.8% frequency of detection). The maximum concentration detected in the Maumee watershed was 38.7 µg/L with an overall average concentration of 3.7 µg/L.

This analysis was further refined by deriving the annual TWM and maximum concentrations by sampled watershed by year. The results of this analysis are presented in Table D.11. The results show a consistent pattern with that seen in other data collected from high atrazine use areas with general TWM concentrations between 1 and 3 µg/L. In addition, these data are generally two times lower than the peak refined flow-adjusted EECs and are only slightly higher than the flow-adjusted annual average concentrations.

Table D.11 Annual Time Weighted Mean and Maximum Concentrations (µg/L) for Atrazine in Two Ohio Watersheds from the Heidelberg College Data

Year	Sandusky Watershed		Maumee Watershed	
	TWM	Max	TWM	Max
1983	1.34	7.97	0.98	5.42
1984	1.08	8.73	1.27	11.71

Table D.11 Annual Time Weighted Mean and Maximum Concentrations (µg/L) for Atrazine in Two Ohio Watersheds from the Heidelberg College Data				
Year	Sandusky Watershed		Maumee Watershed	
	TWM	Max	TWM	Max
1985	1.83	19.46	1.00	6.21
1986	3.32	24.61	1.64	10.01
1987	1.76	16.45	1.80	9.92
1988	0.41	1.53	0.43	2.15
1989	1.30	15.71	1.07	8.49
1990	1.96	19.31	1.69	14.78
1991	1.49	20.59	2.044	21.45
1992	0.39	40.53	0.51	7.35
1993	1.27	26.34	1.21	22.66
1994	0.86	10.10	0.82	4.02
1995	1.39	15.46	1.30	14.06
1996	1.56	23.40	1.19	16.19
1997[a]	**2.16**	**53.21**	2.09	38.74
1998	1.49	40.03	1.41	27.62
1999	1.57	17.11	1.88	19.37

[a] Sample year 1997 from Sandusky selected for data infilling by interpolation in order to calculate CASM duration exposure values.

As with the ecological monitoring program data and the USGS NAWQA data, these data are not considered to be directly representative of the habitat where the pallid sturgeon resides and thus are provided herein for context only. No further analysis of these data was conducted.

D.5 Summary of Open Literature Sources of Monitoring Data for Atrazine

Atrazine is likely to be persistent in ground water and in surface waters with relatively long hydrologic residence times (such as in some reservoirs) where advective transport (flow) is limited. The reasons for atrazine's persistence are its resistance to abiotic hydrolysis and direct aqueous photolysis, its only moderate susceptibility to biodegradation, and its limited volatilization potential as indicated by a relatively low Henry's Law constant. Atrazine has been observed to remain at elevated concentrations longer in some reservoirs than in flowing surface water or in other reservoirs with presumably much shorter hydrologic residence times in which advective transport (flow) greatly limits its persistence.

A number of open literature studies cited in the 2003 IRED (U.S. EPA, 2003a), document the occurrence of atrazine and its degradates in both surface water and groundwater. These data support the general conclusion that higher exposures tend to occur in the most vulnerable areas in the Midwest and South and that the most vulnerable water bodies tend to be headwater streams and water bodies with little or no flow.

The analysis in the IRED also documents the occurrence of atrazine in the atmosphere. The data indicate that atrazine can enter the atmosphere via volatilization and spray drift. The data also suggest that atrazine is frequently found in rain samples and tends to be seasonal, related to application timing. Finally, the data suggest that although frequently detected, atrazine concentrations detected in rain samples are less than those seen in the monitoring data and modeling conducted as part of this assessment and support the contention that runoff and spray drift are the principal routes of exposure. More details on these data can be found in the 2003 IRED (U.S. EPA, 2003a).

D.6 Miscellaneous Drinking Water Monitoring Data Derived from Surface Water

A number of surface water data sets were evaluated as part of the 2003 IRED. Included in that analysis were data from Acetochlor Registration Partnership (ARP) Monitoring Study, the Novartis Population Linked Exposure (PLEX) Database, the USGS 1992-1993 Study of 76 Mid-Western Reservoirs (USGS Open File Report 96-393), the USGS 1989-1990 Reconnaissance Study of Mid-Western Streams (USGS Open File Report 93-457), the USGS 1994-1995 Reconnaissance Study of Mid-Western Streams (USGS Open File Report 98-181), the USGS 1990-1992 Study of 9 Mid-Western Streams (USGS Open File Report 94-396), USGS NAWQA data available in 2002, as well as numerous open literature studies. In general, these data show a pattern of atrazine exposure in various water body types (streams vs. reservoirs), collected with a variety of study objectives (human health vs. ecological health) consistent with those summarized previously in this assessment. The maximum reported concentration from the studies (excluding open literature) was 108 µg/L from the USGS study (Open File Report 93-457) for Mid-Western Streams sampled between 1989 and 1990. Atrazine exposure in rivers, streams, lakes, and reservoirs documented in the open literature cited in the 2003 IRED were

consistent with these results with no concentrations above 100 µg/L (except edge of field runoff concentrations in mg/l range which were reported as diluted to µg/L ranges when reaching surface water bodies). In addition, the 2003 IRED summarized reports from the Agency's 6(a)(2) incident database and found the highest concentration at 62 µg/L.

More detail on the individual studies and analysis of the data may be found in the 2003 IRED at the following website:

http://www.epa.gov/oppsrrd1/reregistration/atrazine/efed_redchap_22apr02.pdf

Subsequent to the completion of the 2003 IRED, additional monitoring data from surface water sources used for drinking water were submitted to the Agency for review. Atrazine monitoring results from 2003 to 2005 were collected as part of the Atrazine Monitoring Program (AMP) for purposes of assessing dietary risk for human health. In this study, data were collected from over 100 community water systems (CWS) in 10 states including many in the action area of this assessment. Monitoring was weekly through the growing season (generally April through July) with biweekly monitoring for the rest of the year. Both raw and finished water were monitored. In general, the results were consistent with those discussed above, with maximum detected concentrations of 33.1 µg/L in 2002, 39.7 µg/L in 2004, and 84.8 µg/L in 2005.