TABLES & FIGURES

Table 8
TMDL Summary by subwatershed for the Christina River Basin

5480.7871.9040.6091.526

Sum of individual Waste Load Allocations					
Subwatershed	CBOD5 lbs/day	NH3-N lbs/day	TN lbs/day	TP lbs/day	DO lbs/day
Brandywine Creek main stem	62.358	14.795	38.142	6.589	20.998
Brandywine Creek East Branch	1,292.132	195.635	2,712.826	89.849	587.092
Brandywine Creek West Branch	642.989	108.394	1,513.838	46.229	247.871
Buck Run	7.548	0.787	1.904	0.609	1.526
Brandywine Creek Watershed	2,005.027	319.611	4,266.710	143.276	857.487
Burroughs Run	0.042	0.006	0.015	0.008	0.025
Red Clay Creek West Branch	162.105	19.332	46.909	12.819	71.307
Red Clay Creek Mainstem	108.879	4.810	11.598	75.460	112.027
Red Clay Creek Watershed	271.026	24.148	58.522	88.287	183.359
White Clay Creek Middle Branch	53.793	10.508	25.439	4.504	11.259
White Clay Creek East Branch	88.717	8.688	149.558	11.222	16.154
Muddy Run	0.000	0.000	0.000	0.000	0.000
Pike Creek	0.000	0.000	0.000	0.000	0.000
Mill Creek	0.000	0.000	0.000	0.000	0.000
White Clay Creek Mainstem	0.751	0.025	0.060	0.025	1.251
White Clay Creek Watershed	143.261	19.221	175.057	15.751	28.664
Christina River West Branch	80.418	12.339	29.836	6.255	37.530
Little Mill Creek	0.000	0.000	0.000	0.000	0.000
Christina River Mainstem	0.000	0.000	0.000	0.000	0.000
Christina River Watershed	80.418	12.339	29.836	6.255	37.530
Waste Load Allocations for point sources in the Christina Basin	2,499.732	375.319	4,530.125	253.569	1,107.040

Total Waste Load Allocation for the Christina River Basin	2,499.732	375.319	4,530.125	253.569	1,107.040
Load Allocations					
Subwatershed	CBOD5 lbs/day	NH3-N lbs/day	TN lbs/day	TP lbs/day	DO lbs/day
Brandywine Creek main stem	47.600	1.269	126.933	1.269	465.843
Brandywine Creek East Branch	132.869	2.986	203.036	2.687	1,095.800
Brandywine Creek West Branch	76.733	2.046	204.623	2.046	750.965
Buck Run	32.366	0.863	86.310	0.863	316.758
Brandywine Creek Watershed	289.568	7.164	620.902	6.865	2,629.366
Burroughs Run	4.579	0.092	9.067	0.206	33.613
Red Clay Creek West Branch	19.988	0.400	39.577	0.899	146.713
Red Clay Creek Mainstem	39.761	0.795	78.726	1.789	291.629
Red Clay Creek Watershed	64.328	1.287	127.370	2.894	471.955
White Clay Creek Middle Branch	20.723	0.648	57.960	0.648	237.667
White Clay Creek East Branch	23.309	0.728	65.193	0.728	267.326
Muddy Run	3.207	0.100	8.969	0.100	36.777
Pike Creek	5.517	0.172	15.430	0.172	63.272
Mill Creek	7.586	0.237	21.217	0.237	87.000
White Clay Creek Mainstem	17.585	0.550	49.184	0.550	201.681
White Clay Creek Watershed	77.927	2.435	217.953	2.435	893.723
Christina River West Branch	1.156	0.016	0.808	0.016	5.932
Little Mill Creek	36.210	0.506	25.322	0.506	185.863
Christina River Mainstem	31.742	0.444	22.197	0.444	162.927
Christina River Watershed	69.108	0.966	48.327	0.966	354.722
Total LA for the Christina Basin	500.931	11.852	1,014.552	13.160	4,349.766
Margin of Safety	Implicit through conservative assumptions				
TMDL for the Christina Basin	3,000.663	387.171	5,544.677	266.729	5,456.806

Table 12
TMDL Summary of Buck Run

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
PA0036161	0.0360	25.00	2.60	6.29	2.00	5.00	7.506	0.781	1.889	0.600	1.501	0.0%	0.0%	0.0%
PA0057231	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
	Total Waste Load Allocations						7.548	0.787	1.904	0.609	1.526			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
B05	4.40	0.75	0.02	2.00	0.02	7.34	17.779	0.474	47.411	0.474	173.999	0.0%	0.0%	0.0%
B06	3.61	0.75	0.02	2.00	0.02	7.34	14.587	0.389	38.899	0.389	142.758	0.0%	0.0%	0.0%
	Total Load Allocations						32.366	0.863	86.310	0.863	316.758			

Table 13
TMDL summary for Brandywine Creek West Branch

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
PA0056561	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0029912	0.1000	24.72	19.78	47.87	1.98	3.00	20.616	16.497	39.924	1.651	2.502	1.1%	1.1%	1.1%
PA0053996	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0053228	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0053236	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0036897	0.3900	24.72	6.92	49.45	1.98	2.00	80.404	22.508	160.841	6.440	6.505	1.1%	1.1%	1.1%
PA0026859	3.8500	8.08	1.54	38.50	0.77	5.00	259.441	49.448	1236.197	24.724	160.545	46.1%	23.0%	61.5%
PA0011568-001	0.5000	23.10	0.50	4.65	0.30	5.00	96.327	2.085	19.391	1.251	20.850	23.0%	0.0%	0.0%
PA0011568-016	0.5000	23.10	0.50	4.65	0.30	5.00	96.327	2.085	19.391	1.251	20.850	23.0%	0.0%	0.0%
PA0053821	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0056073	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0012416	0.0750	10.00	0.10	0.24	0.10	5.00	6.255	0.063	0.150	0.063	3.128	0.0%	0.0%	0.0%
PA0052990	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0052728	0.0004	25.00	1.50	3.63	2.00	2.00	0.083	0.005	0.012	0.007	0.007	0.0%	0.0%	0.0%
PA0055697	0.0490	24.25	1.46	3.52	1.94	3.00	9.910	0.597	1.438	0.793	1.226	3.0%	3.0%	3.0%
PA0036412	0.0500	10.00	2.90	7.02	1.90	5.00	4.170	1.209	2.927	0.792	2.085	0.0%	0.0%	0.0%
PA0044776	0.6000	13.83	2.77	6.69	1.84	6.00	69.205	13.861	33.477	9.207	30.024	7.8%	7.8%	7.8%
PA0057339	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
	Total Waste Load Allocation						642.989	108.394	1513.838	46.229	247.871			

Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
B01	4.23	0.75	0.020	2.00	0.020	7.34	17.092	0.456	45.579	0.456	167.277	0.0%	0.0%	0.0%
B02	6.22	0.75	0.020	2.00	0.020	7.34	25.133	0.670	67.022	0.670	245.972	0.0%	0.0%	0.0%
B03	4.77	0.75	0.020	2.00	0.020	7.34	19.274	0.514	51.398	0.514	188.631	0.0%	0.0%	0.0%
B04	2.74	0.75	0.020	2.00	0.020	7.34	11.072	0.295	29.524	0.295	108.354	0.0%	0.0%	0.0%
B07	1.03	0.75	0.020	2.00	0.020	7.34	4.162	0.111	11.099	0.111	40.732	0.0%	0.0%	0.0%
	Total Load Allocation						76.733	2.046	204.623	2.046	750.965			

Table 14
TMDL Summary of Brandywine Creek East Branch

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
PA0056171	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0026018	1.8000	23.48	2.35	5.68	1.88	5.00	352.482	35.278	85.268	28.223	75.060	6.1%	6.1%	6.1%
PA0054747	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0057282	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0051365	0.3690	2.00	0.10	0.24	0.10	5.00	6.155	0.308	0.739	0.308	15.387	0.0%	0.0%	0.0%
PA0053937	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0056324	0.0440	2.00	0.04	2.10	0.11	5.00	0.734	0.015	0.771	0.040	1.835	0.0%	0.0%	0.0%
PA0056618	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0054305	0.0000	30.00	0.50	4.65	0.30	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0053561	0.0360	2.00	0.04	2.10	0.11	5.00	0.600	0.012	0.631	0.033	1.501	0.0%	0.0%	0.0%
PA0043982	0.4000	22.27	0.10	22.23	1.78	2.00	74.293	0.334	74.159	5.938	6.672	10.9%	0.0%	10.9%
PA0012815	3.0000	20.06	3.54	32.92	0.45	5.00	501.901	88.571	823.658	11.259	125.100	41.0%	41.0%	54.5%
PA0026531	7.0000	5.90	1.18	29.50	0.73	6.00	344.442	68.888	1722.210	42.617	350.280	41.0%	41.0%	63.6%
PA0030228	0.0225	6.86	0.98	2.37	2.94	5.00	1.287	0.184	0.445	0.552	0.938	2.0%	2.0%	2.0%
PA0051918	0.1440	2.00	0.10	0.24	0.10	5.00	2.402	0.120	0.288	0.120	6.005	0.0%	0.0%	0.0%
PA0053678	0.0000	30.00	0.50	4.65	0.30	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0053660	0.0000	30.00	0.50	4.65	0.30	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0055531	0.0007	25.00	1.50	3.63	2.00	3.00	0.146	0.009	0.021	0.012	0.018	0.0%	0.0%	0.0%
PA0057126	0.0000	30.00	0.50	4.65	0.30	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0054917	0.0030	6.86	0.98	2.37	0.98	6.00	0.172	0.025	0.059	0.025	0.150	2.0%	2.0%	2.0%
PA0057045	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0036374	0.0150	10.00	0.50	1.21	0.50	5.00	1.251	0.063	0.151	0.063	0.626	0.0%	0.0%	0.0%

PA0052949	0.0000	30.00	0.50	4.65	0.30	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0057274	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0050458	0.0351	9.80	2.94	7.11	0.98	6.00	2.869	0.861	2.081	0.287	1.756	2.0%	2.0%	2.0%
PA0050229	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0050547	0.0375	9.80	2.94	7.11	0.98	5.00	3.065	0.919	2.224	0.306	1.564	2.0%	2.0%	2.0%
PA0055492	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0054691	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
	Total Waste Load Allocation						1292.132	195.635	2712.826	89.849	587.092			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
B08	12.26	0.89	0.020	1.36	0.018	7.34	58.787	1.321	89.831	1.189	484.825	0.0%	0.0%	0.0%
B09	1.90	0.89	0.020	1.36	0.018	7.34	9.111	0.205	13.922	0.184	75.136	0.0%	0.0%	0.0%
B10	3.77	0.89	0.020	1.36	0.018	7.34	18.077	0.406	27.624	0.366	149.086	0.0%	0.0%	0.0%
B11	3.40	0.89	0.020	1.36	0.018	7.34	16.303	0.366	24.912	0.330	134.454	0.0%	0.0%	0.0%
B12	3.08	0.89	0.020	1.36	0.018	7.34	14.769	0.332	22.568	0.299	121.799	0.0%	0.0%	0.0%
B13	3.30	0.89	0.020	1.36	0.018	7.34	15.824	0.356	24.180	0.320	130.499	0.0%	0.0%	0.0%
	Total Load Allocation						132.869	2.986	203.036	2.687	1095.800			

Table 15
TMDL Summary of Brandywine Creek Mainstem

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
DE0050962	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
DE0021768	0.0250	15.00	1.50	3.63	2.00	5.00	3.128	0.313	0.757	0.417	1.043	0.0%	0.0%	0.0%
PA0053082	0.0206	10.00	3.00	7.26	2.00	5.00	1.718	0.515	1.247	0.344	0.859	0.0%	0.0%	0.0%
PA0052663	0.0900	10.00	1.00	2.42	2.00	5.00	7.506	0.751	1.816	1.501	3.753	0.0%	0.0%	0.0%
PA0055476	0.0231	10.00	3.00	7.26	2.00	3.00	1.927	0.578	1.399	0.385	0.578	0.0%	0.0%	0.0%
PA0047252	0.0700	25.00	3.00	7.26	2.00	3.00	14.595	1.751	4.238	1.168	1.751	0.0%	0.0%	0.0%
PA0055085	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0055484	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0030848	0.0063	25.00	1.50	3.63	2.00	3.00	1.314	0.079	0.191	0.105	0.158	0.0%	0.0%	0.0%
PA0056120	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
PA0031097	0.0170	25.00	20.00	48.40	2.00	5.00	3.545	2.836	6.862	0.284	0.709	0.0%	0.0%	0.0%
PA0053449	0.0230	15.00	1.50	3.63	2.00	5.00	2.877	0.288	0.696	0.384	0.959	0.0%	0.0%	0.0%
PA0057011	0.0773	25.00	3.50	8.47	2.00	5.00	16.117	2.256	5.460	1.289	3.223	0.0%	0.0%	0.0%
PA0036200	0.0320	25.00	20.00	48.40	2.00	3.00	6.672	5.338	12.917	0.534	0.801	0.0%	0.0%	0.0%
PA0050005	0.1400	2.00	0.04	2.10	0.11	5.00	2.335	0.047	2.452	0.128	5.838	0.0%	0.0%	0.0%
PA0051497	0.0300	2.00	0.10	0.24	0.10	5.00	0.500	0.025	0.060	0.025	1.251	0.0%	0.0%	0.0%
	Total Waste Load Allocations						62.358	14.795	38.142	6.589	20.998			

Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
B14	2.74	0.75	0.020	2.00	0.020	7.34	11.072	0.295	29.524	0.295	108.354	0.0%	0.0%	0.0%
B15	4.40	0.75	0.020	2.00	0.020	7.34	17.779	0.474	47.411	0.474	173.999	0.0%	0.0%	0.0%
B16	3.61	0.75	0.020	2.00	0.020	7.34	14.587	0.389	38.899	0.389	142.758	0.0%	0.0%	0.0%
B17	1.03	0.75	0.020	2.00	0.020	7.34	4.162	0.111	11.099	0.111	40.732	0.0%	0.0%	0.0%
	Total Load Allocations						47.600	1.269	126.933	1.269	465.843			

Table 16
TMDL Summary for Burroughs Run

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
PA0055425	0.0005	10.00	1.50	3.63	2.00	6.00	0.042	0.006	0.015	0.008	0.025	0.0%	0.0%	0.0%
	Total Waste Load Allocation						0.042	0.006	0.015	0.008	0.025			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
R03	0.85	1.00	0.020	1.98	0.045	7.34	4.579	0.092	9.067	0.206	33.613	0.0%	0.0%	0.0%
	Total Load Allocation						4.579	0.092	9.067	0.206	33.613			

Table 17
TMDL Summary for Red Clay Creek West Branch

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
PA0053554	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
PA0024058	1.1000	16.62	1.99	4.83	1.28	6.00	152.472	18.256	44.310	11.743	55.044	33.5%	33.5%	82.9%
PA0050679	0.2500	2.00	0.10	0.24	0.10	5.00	4.170	0.209	0.500	0.209	10.425	0.0%	0.0%	0.0%
PA0057720-001	0.0500	9.50	1.90	4.60	1.90	5.00	3.962	0.792	1.918	0.792	2.085	5.0%	5.0%	5.0%
PA0057720-002	0.0900	2.00	0.10	0.24	0.10	5.00	1.501	0.075	0.180	0.075	3.753	0.0%	0.0%	0.0%
	Total Waste Load Allocation						162.105	19.332	46.909	12.819	71.307			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
R01	3.71	1.00	0.020	1.98	0.045	7.34	19.988	0.400	39.577	0.899	146.713	0.0%	0.0%	0.0%
	Total Load Allocation						19.988	0.400	39.577	0.899	146.713			

Table 18
TMDL Summary for Red Clay Creek Mainstem and East Branch

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
DE0000230	0.3500	7.00	0.10	0.24	0.10	5.00	20.433	0.292	0.701	0.292	14.595	0.0%	0.0%	0.0%
DE0021709	0.0150	20.00	1.50	3.63	2.00	5.00	2.502	0.188	0.454	0.250	0.626	0.0%	0.0%	0.0%
DE0050067	0.0015	30.00	1.50	3.63	2.00	5.00	0.375	0.019	0.045	0.025	0.063	0.0%	0.0%	0.0%
DE0000451	2.1700	3.00	0.10	0.24	4.00	5.00	54.293	1.810	4.343	72.391	90.489	0.0%	0.0%	0.0%
PA0055107	0.1500	25.00	2.00	4.84	2.00	5.00	31.275	2.502	6.055	2.502	6.255	0.0%	0.0%	0.0%
PA0054755	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
	Total Waste Load Allocation						108.879	4.810	11.598	75.460	112.027			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
R02	1.39	1.00	0.020	1.98	0.045	7.34	7.489	0.150	14.828	0.337	54.968	0.0%	0.0%	0.0%
R04	1.37	1.00	0.020	1.98	0.045	7.34	7.381	0.148	14.615	0.332	54.177	0.0%	0.0%	0.0%
R05	3.62	1.00	0.020	1.98	0.045	7.34	19.503	0.390	38.616	0.878	143.154	0.0%	0.0%	0.0%
HOOPES	1.00	1.00	0.020	1.98	0.045	7.30	5.388	0.108	10.668	0.242	39.330	0.0%	0.0%	0.0%
	Total Load Allocation						39.761	0.795	78.726	1.789	291.629			

Table 19
TMDL Summary for the White Clay Creek Middle Branch

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
PA0053783	0.0200	10.00	3.00	7.26	2.00	5.00	1.668	0.500	1.211	0.334	0.834	0.0%	0.0%	0.0%
PA0024066	0.2500	25.00	4.80	11.62	2.00	5.00	52.125	10.008	24.228	4.170	10.425	0.0%	0.0%	0.0%
	Total Waste Load Allocation						53.793	10.508	25.439	4.504	11.259			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
W01	2.35	0.64	0.020	1.79	0.020	7.34	8.103	0.253	22.663	0.253	92.931	0.0%	0.0%	0.0%
W02	3.66	0.64	0.020	1.79	0.020	7.34	12.620	0.394	35.297	0.394	144.736	0.0%	0.0%	0.0%
	Total Load Allocation						20.723	0.648	57.960	0.648	237.667			

Table 20
TMDL Summary for the White Clay Creek East Branch

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
PA0052451	0.0012	25.00	20.00	48.40	2.00	2.00	0.250	0.200	0.484	0.020	0.020	0.0%	0.0%	0.0%
PA0057029	0.1440	2.00	0.04	2.10	0.11	5.00	2.402	0.048	2.522	0.132	6.005	0.0%	0.0%	0.0%
PA0025488	0.3000	25.00	2.00	50.00	4.00	2.00	62.550	5.004	125.100	10.008	5.004	0.0%	0.0%	0.0%
PA0052019	0.0075	25.00	6.00	14.52	2.00	6.00	1.564	0.375	0.908	0.125	0.375	0.0%	0.0%	0.0%
PA0056898	0.0650	25.00	3.50	32.55	0.30	5.00	13.553	1.897	17.645	0.163	2.711	0.0%	0.0%	0.0%
PA0056952	0.0029	30.00	0.50	4.65	0.30	5.00	0.726	0.012	0.112	0.007	0.121	0.0%	0.0%	0.0%
PA0029343	0.0270	20.00	3.00	7.26	2.00	5.00	4.504	0.676	1.635	0.450	1.126	0.0%	0.0%	0.0%
PA0040436	0.0090	20.00	3.00	7.26	2.00	5.00	1.501	0.225	0.545	0.150	0.375	0.0%	0.0%	0.0%
PA0040665	0.0100	20.00	3.00	7.26	2.00	5.00	1.668	0.250	0.605	0.167	0.417	0.0%	0.0%	0.0%
	Total Waste Load Allocation						88.717	8.688	149.558	11.222	16.154			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
W03	4.32	0.64	0.020	1.79	0.020	7.34	14.896	0.465	41.662	0.465	170.836	0.0%	0.0%	0.0%
W04	2.44	0.64	0.020	1.79	0.020	7.34	8.413	0.263	23.531	0.263	96.490	0.0%	0.0%	0.0%
	Total Load Allocation						23.309	0.728	65.193	0.728	267.326			

Table 21
TMDL summary of Muddy Run

Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
W07	0.93	0.64	0.020	1.79	0.020	7.34	3.207	0.100	8.969	0.100	36.777	0.0%	0.0%	0.0%
	Total Load Allocation						3.207	0.100	8.969	0.100	36.777			

Table 22
TMDL Summary of Pike Creek

Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
W06	1.60	0.64	0.020	1.79	0.020	7.34	5.517	0.172	15.430	0.172	63.272	0.0%	0.0%	0.0%
	Total Load Allocation						5.517	0.172	15.430	0.172	63.272			

Table 23
TMDL Summary of Mill Creek

Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
W05	2.20	0.64	0.020	1.79	0.020	7.34	7.586	0.237	21.217	0.237	87.000	0.0%	0.0%	0.0%
	Total Load Allocation						7.586	0.237	21.217	0.237	87.000			

Table 24
TMDL Summary of White Clay Creek Mainstem

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
DE0000191	0.0300	3.00	0.10	0.24	0.10	5.00	0.751	0.025	0.060	0.025	1.251	0.0%	0.0%	0.0%
	Total Waste Load Allocation						0.751	0.025	0.060	0.025	1.251			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
W08	1.72	0.64	0.020	1.79	0.020	7.34	5.931	0.185	16.587	0.185	68.018	0.0%	0.0%	0.0%
W09	2.17	0.64	0.020	1.79	0.020	7.34	7.482	0.234	20.927	0.234	85.813	0.0%	0.0%	0.0%
W10	1.21	0.64	0.020	1.79	0.020	7.34	4.172	0.130	11.669	0.130	47.850	0.0%	0.0%	0.0%
	Total Load Allocation						17.585	0.550	49.184	0.550	201.681			

Table 25
TMDL Summary for the Christina River West Branch

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
MD0022641	0.7000	12.80	1.82	4.40	1.00	6.00	74.726	10.625	25.687	5.838	35.028	41.8%	71.8%	0.0%
MD0065145	0.0500	13.65	4.11	9.95	1.00	6.00	5.692	1.714	4.149	0.417	2.502	9.0%	9.0%	0.0%
	Total Waste Load Allocation						80.418	12.339	29.836	6.255	37.530			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
C01WB	0.15	1.43	0.02	1.00	0.02	7.34	1.156	0.016	0.808	0.016	5.932	0.0%	0.0%	0.0%
	Total Load Allocation						1.156	0.016	0.808	0.016	5.932			

Table 26
TMDL Summary for Little Mill Creek

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
DE0000523	0.0000	20.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
DE0000566	0.0000	20.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
	Total Waste Load Allocation						0.000	0.000	0.000	0.000	0.000			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
C04	4.70	1.43	0.02	1.00	0.02	7.34	36.210	0.506	25.322	0.506	185.863	0.0%	0.0%	0.0%
	Total Load Allocation						36.210	0.506	25.322	0.506	185.863			

Table 27
TMDL Summary of the Christina River Mainstem

Waste Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
DE0000400	0.0000	2.00	0.10	0.24	0.10	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
DE0051004	0.0000	15.00	1.50	3.63	2.00	5.00	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%
	Total Waste Load Allocation						0.000	0.000	0.000	0.000	0.000			
Load Allocations														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
Subwatershed	cfs	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
C01	0.60	1.43	0.02	1.00	0.02	7.34	4.623	0.065	3.233	0.065	23.727	0.0%	0.0%	0.0%
C02	0.65	1.43	0.02	1.00	0.02	7.34	5.008	0.070	3.502	0.070	25.704	0.0%	0.0%	0.0%
C03	0.48	1.43	0.02	1.00	0.02	7.34	3.698	0.052	2.586	0.052	18.982	0.0%	0.0%	0.0%
C05	0.80	1.43	0.02	1.00	0.02	7.34	6.163	0.086	4.310	0.086	31.636	0.0%	0.0%	0.0%
C06	1.59	1.43	0.02	1.00	0.02	7.34	12.250	0.171	8.566	0.171	62.877	0.0%	0.0%	0.0%
	Total Load Allocation						31.742	0.444	22.197	0.444	162.927			

Table 28
Point source contributions to the Delaware River Estuary

Point Source Loads														
	Flow	CBOD5	NH3-N	TN	TP	DO	CBOD5	NH3-N	TN	TP	DO	TMDL Percent Reduction		
NPDES	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	CBOD5	NH3-N	TP
DE0021555-001	0.5500	12.00	1.50	3.63	2.00	5.00	55.04	6.88	16.65	9.17	22.94	0.0%	0.0%	0.0%
DE0000256-601	13.0000	25.00	12.00	111.60	0.30	5.00	2710.50	1301.04	12099.67	32.53	542.10	0.0%	0.0%	0.0%
DE0000612-001	0.8000	18.00	0.50	4.65	0.30	5.00	120.10	3.34	31.02	2.00	33.36	0.0%	0.0%	0.0%
DE0020001-001	0.6800	14.00	1.50	3.63	2.00	5.00	79.40	8.51	20.59	11.34	28.36	0.0%	0.0%	0.0%
DE0050911-001	0.3000	13.21	1.50	3.63	2.00	5.00	33.05	3.75	9.08	5.00	12.51	0.0%	0.0%	0.0%
DE0020320-001	90.0000	17.00	1.50	3.63	2.00	5.00	12760.20	1125.90	2724.68	1501.20	3753.00	0.0%	0.0%	0.0%
DE0000051-001	5.2000	30.00	0.50	4.65	0.30	5.00	1301.04	21.68	201.66	13.01	216.84	0.0%	0.0%	0.0%
DE0000051-002	3.0000	8.00	0.50	4.65	0.30	5.00	200.16	12.51	116.34	7.51	125.10	0.0%	0.0%	0.0%
DE0000051-003	6.0000	8.00	0.50	4.65	0.30	5.00	400.32	25.02	232.69	15.01	250.20	0.0%	0.0%	0.0%
DE0000655-001	33.3000	17.00	1.20	11.16	0.30	5.00	4721.27	333.27	3099.38	83.32	1388.61	0.0%	0.0%	0.0%
PA0012637-002	52.3500	30.00	0.50	4.65	0.30	5.00	13097.97	218.30	2030.19	130.98	2183.00	0.0%	0.0%	0.0%
PA0012637-101	69.8000	30.00	0.50	4.65	0.30	5.00	17463.96	291.07	2706.91	174.64	2910.66	0.0%	0.0%	0.0%
PA0012637-201	3.3400	52.00	29.00	269.70	0.30	5.00	1448.49	807.81	7512.66	8.36	139.28	0.0%	0.0%	0.0%
PA0027103-001	44.0000	30.00	30.00	279.00	0.30	5.00	11008.80	11008.80	102381.84	110.09	1834.80	0.0%	0.0%	0.0%
NJ0005405-001	1.2700	45.00	35.00	325.50	0.30	5.00	476.63	370.71	3447.63	3.18	52.96	0.0%	0.0%	0.0%
NJ0024856-001	1.4450	30.00	1.50	3.63	2.00	5.00	361.54	18.08	43.75	24.10	60.26	0.0%	0.0%	0.0%
NJ0021598-001	2.4650	30.00	35.00	84.70	2.00	5.00	616.74	719.53	1741.27	41.12	102.79	0.0%	0.0%	0.0%
NJ0005100-661	22.9000	30.00	0.50	4.65	0.30	5.00	5729.58	95.49	888.08	57.30	954.93	0.0%	0.0%	0.0%
NJ0021601-001	1.7290	30.00	1.50	3.63	2.00	5.00	432.60	21.63	52.34	28.84	72.10	0.0%	0.0%	0.0%
NJ0024023-001	0.9500	40.00	1.50	3.63	2.00	5.00	316.92	11.88	28.76	15.85	39.62	0.0%	0.0%	0.0%
NJ0024635-001	0.0366	15.00	1.50	3.63	2.00	5.00	4.58	0.46	1.11	0.61	1.53	0.0%	0.0%	0.0%
NJ0004286-001	2.1000	30.00	0.50	4.65	0.30	5.00	525.42	8.76	81.44	5.25	87.57	0.0%	0.0%	0.0%
NJ0027545-001	0.9860	30.00	1.50	3.63	2.00	5.00	246.70	12.33	29.85	16.45	41.12	0.0%	0.0%	0.0%

	Total Point Source Load	74111.01	16426.76	139497.59	2296.85	14853.61			

FIGURES

Figure 1. Christina River Basin Study Area

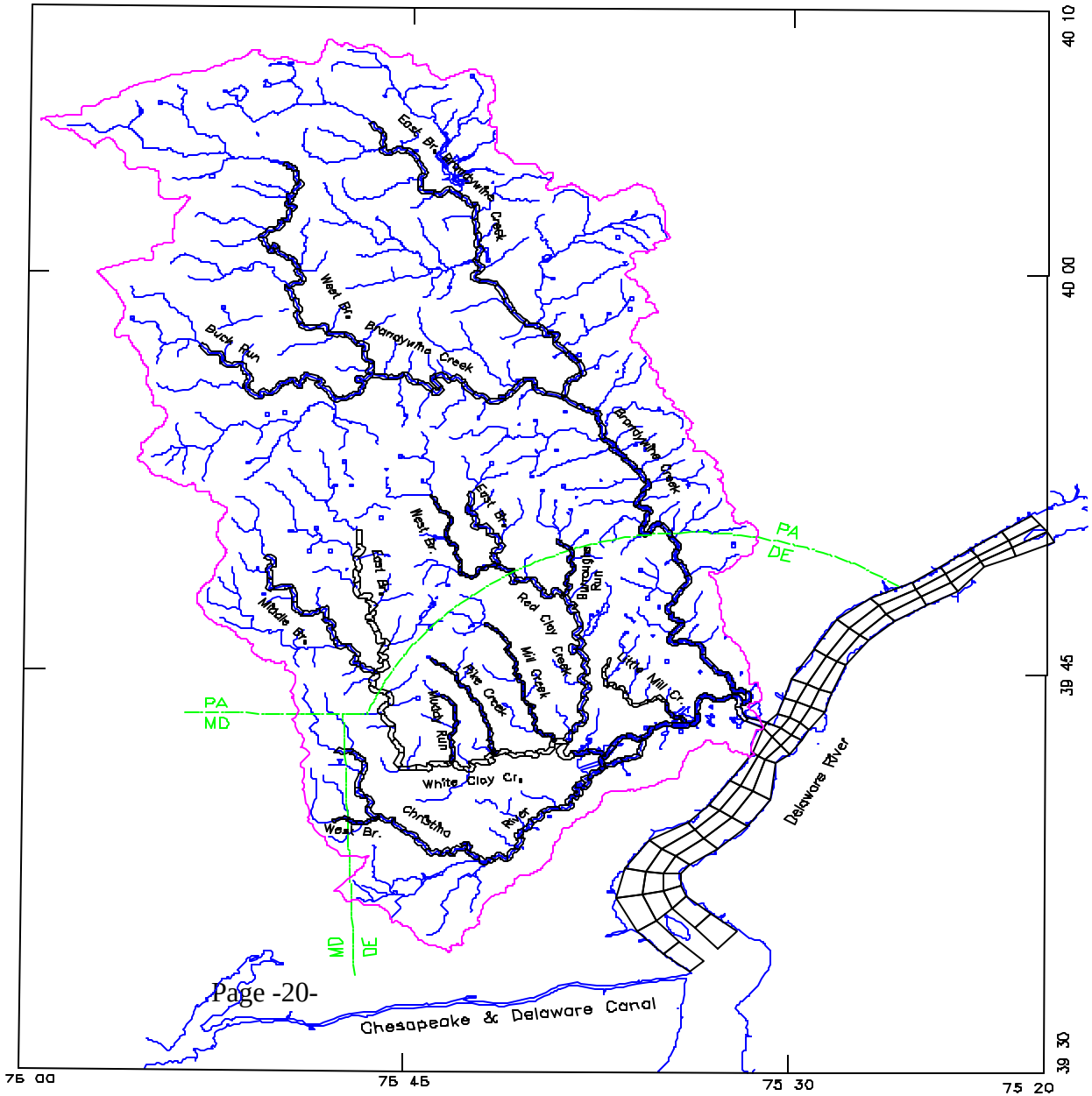


Figure 2. Locations of NPDES discharges in the Christina River Basin

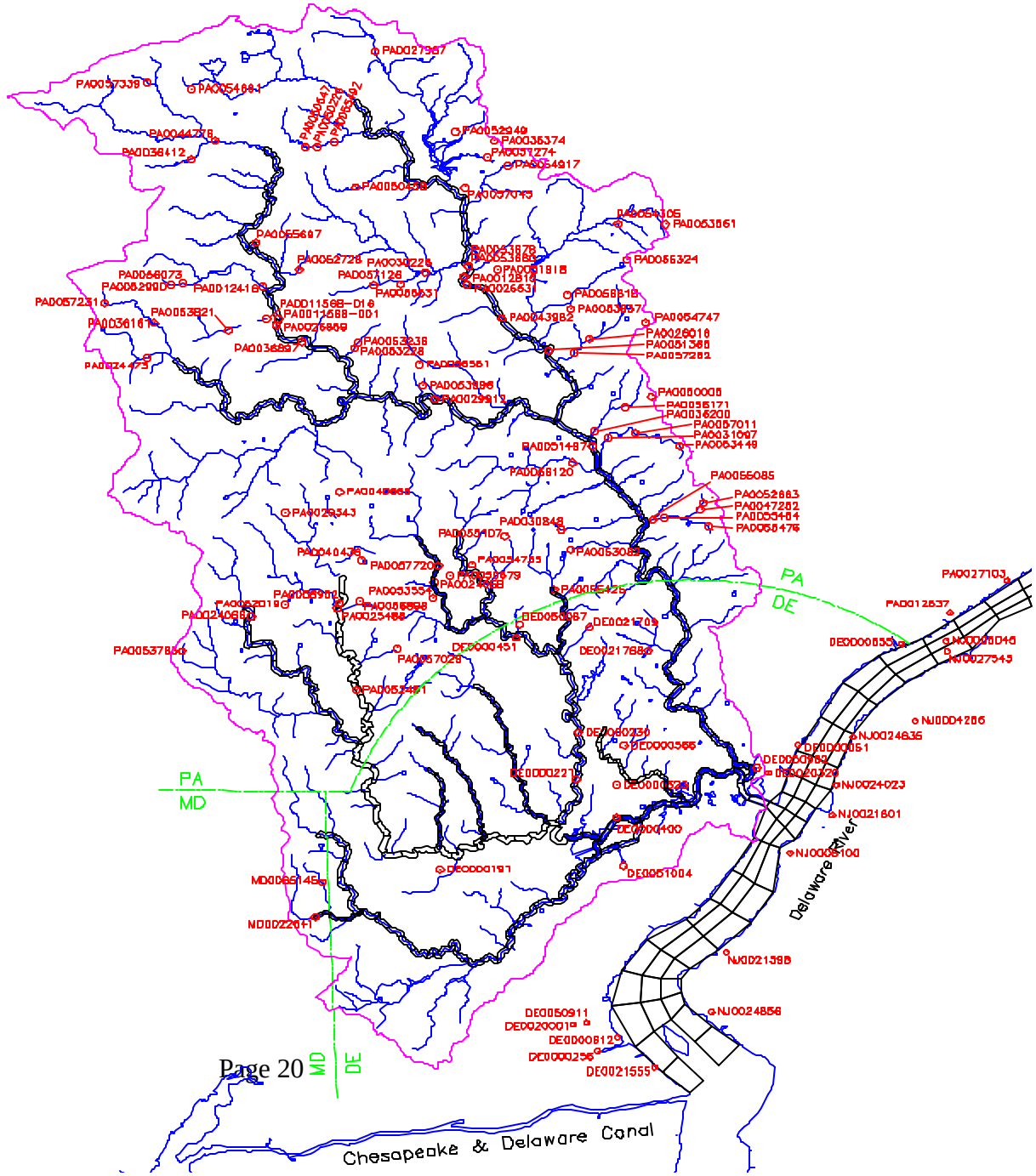


Figure 3. Locations of water quality monitoring stations in the Christina River Basin

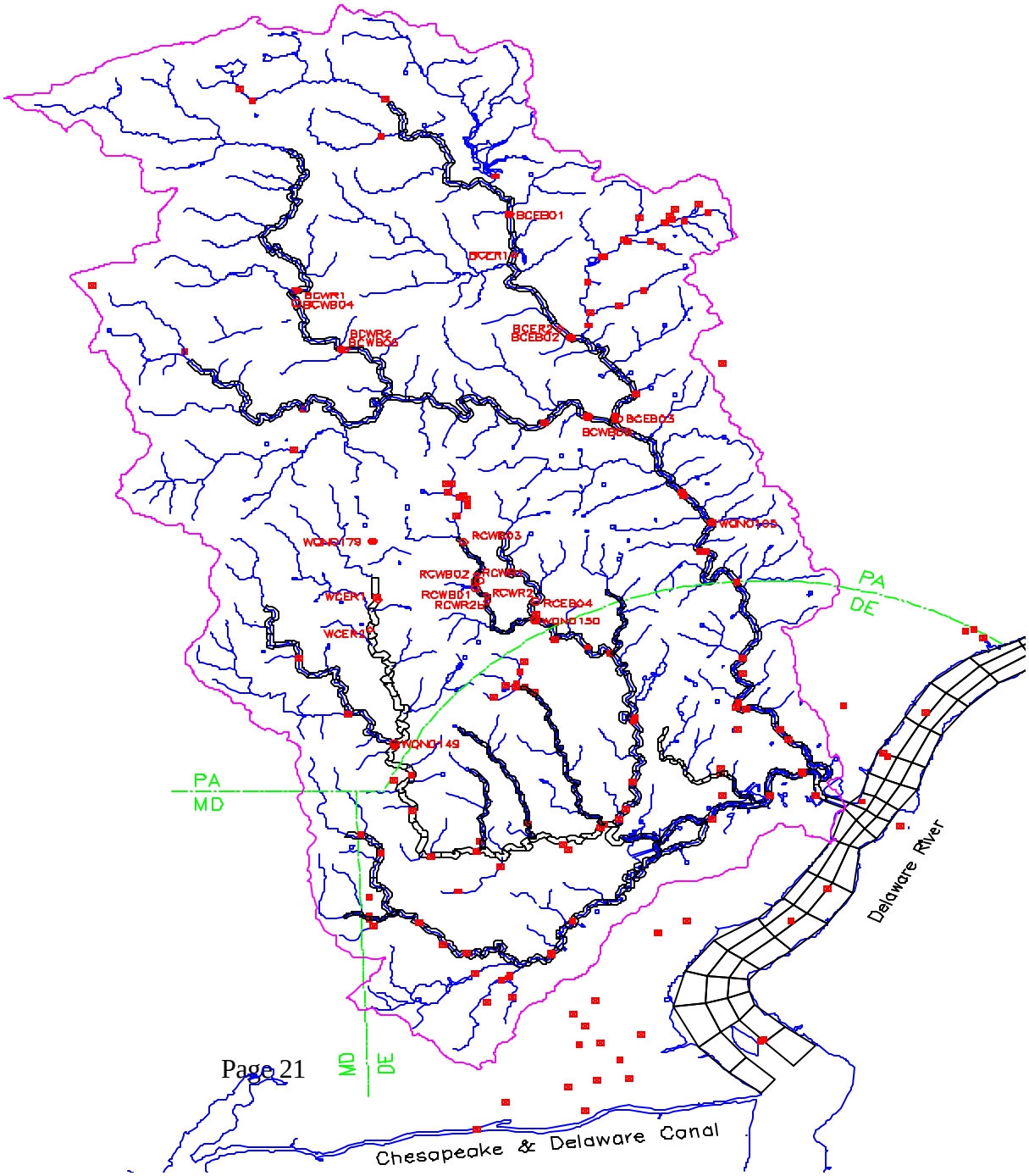


Figure 4. Locations of USGS stream gages in the Christina River Basin

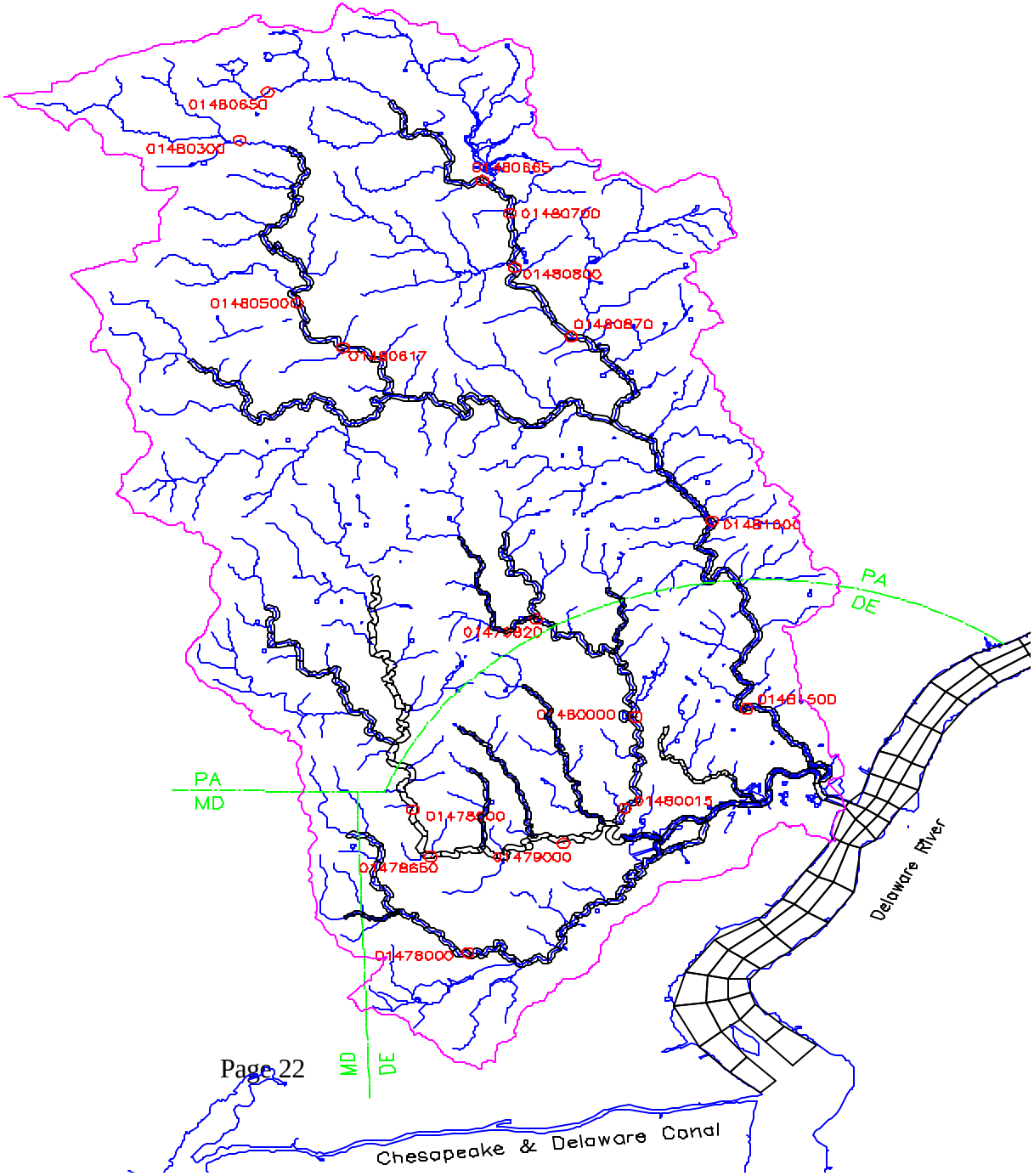


Figure 6. Modeled stream segments violating daily average dissolved oxygen water quality criteria based on the EFDC model using 1997 calibration data.

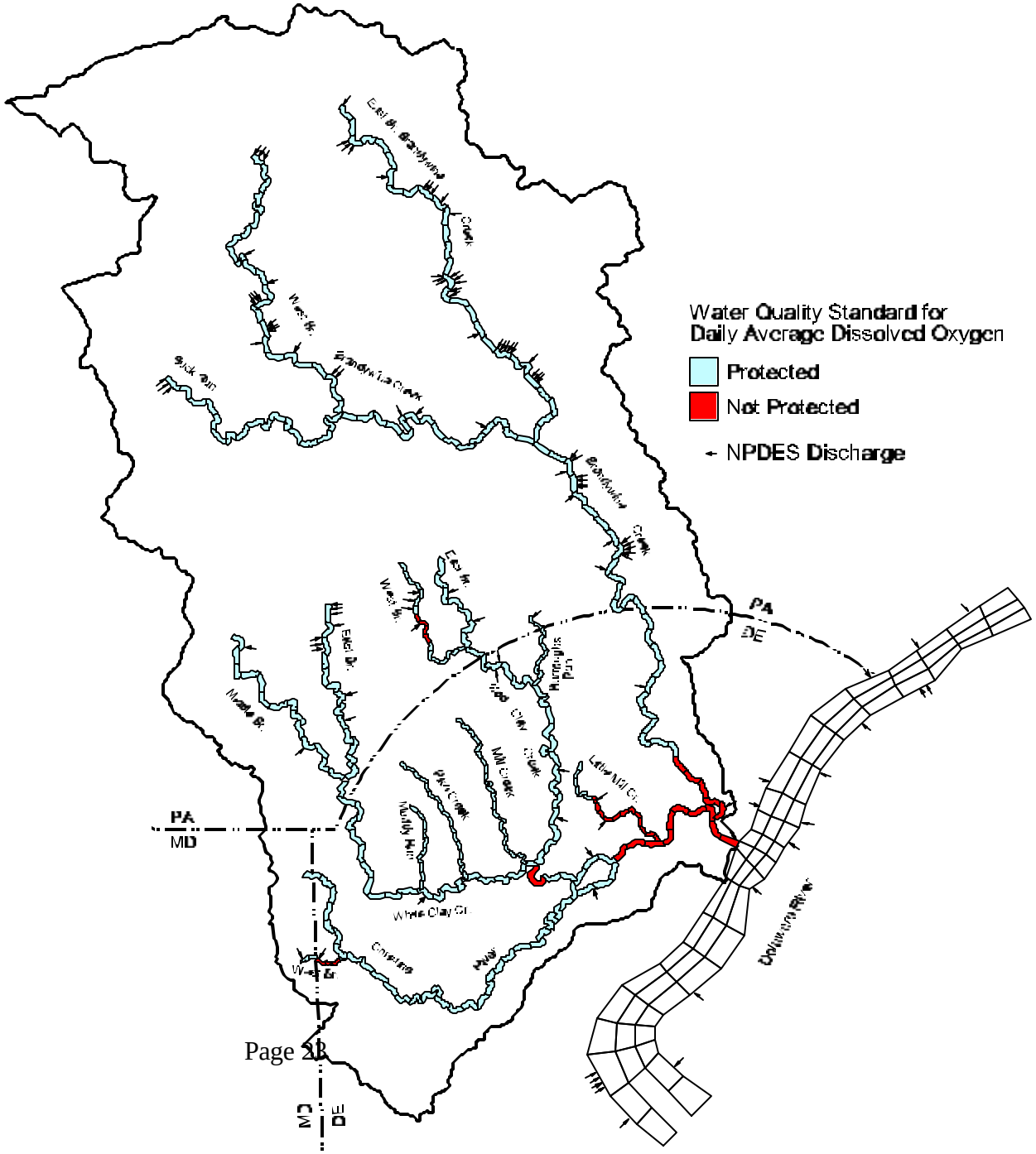


Figure 7. Modeled stream segments violating minimum dissolved oxygen water quality criteria based on the EFDC model using 1997 calibration data.

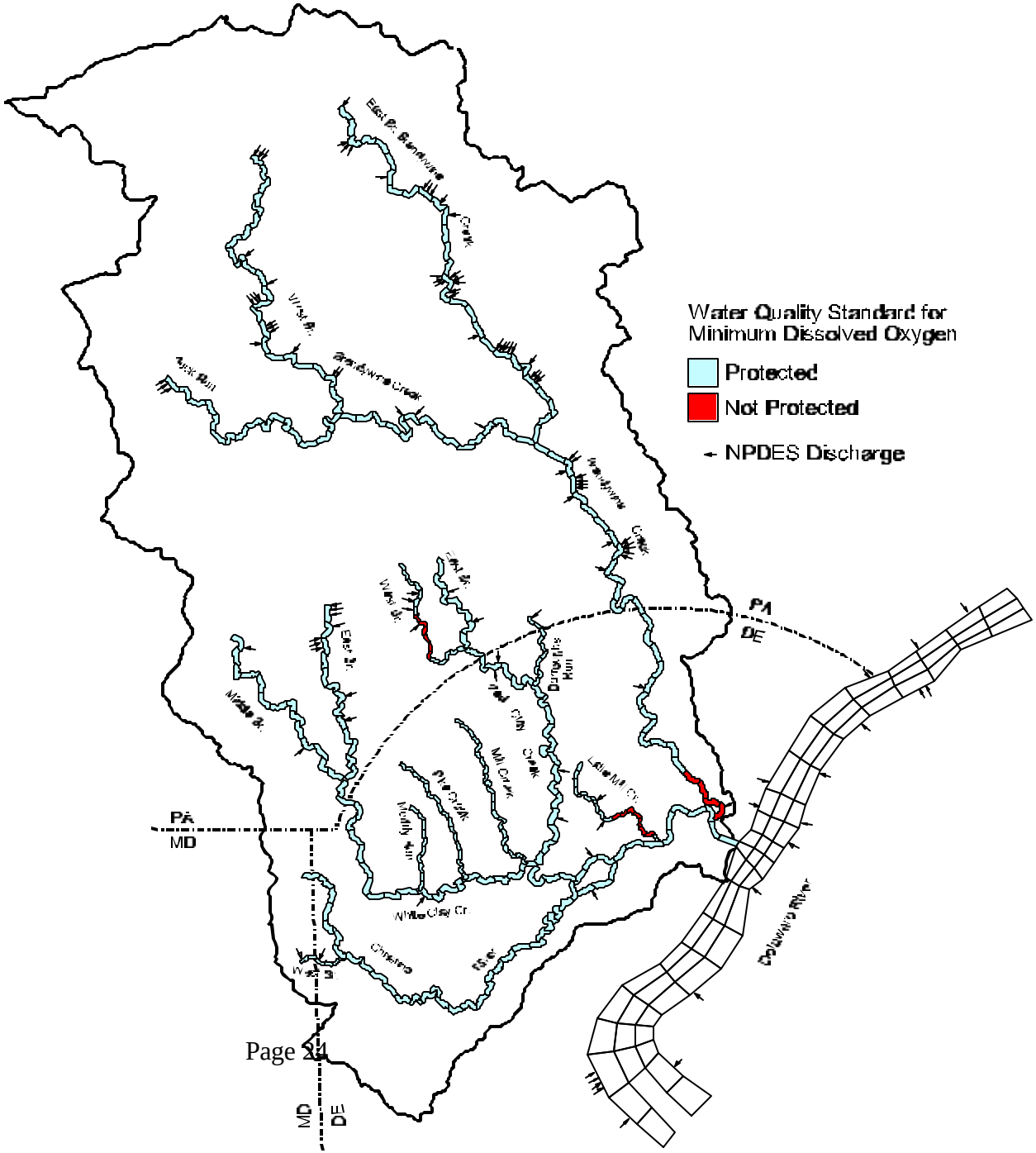


Figure 8. Modeled stream segments violating daily average dissolved oxygen water quality criteria based on the EFDC model during critical conditions.

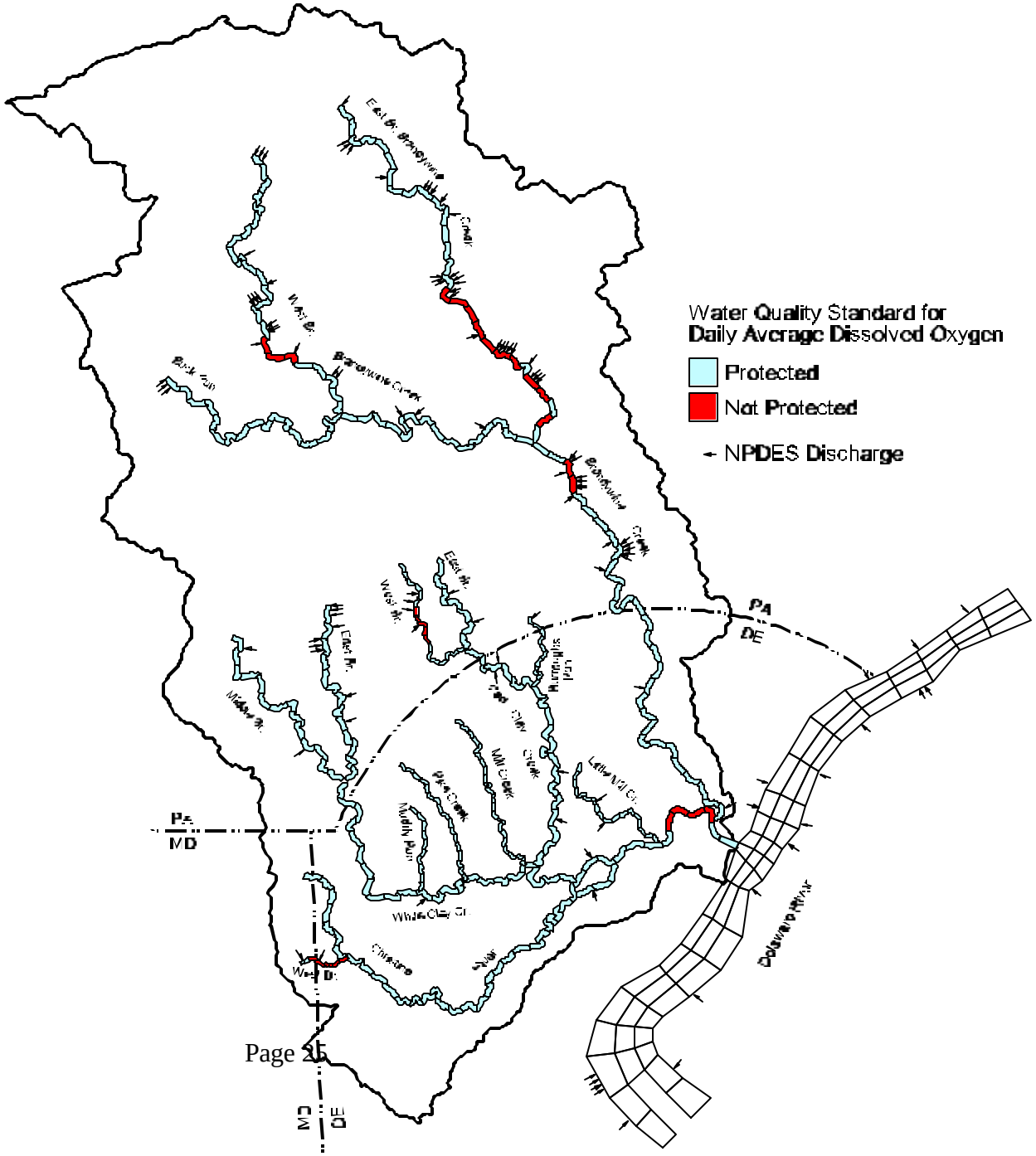


Figure 9. Modeled stream segments violating minimum dissolved oxygen water quality criteria based on the EFDC model during critical conditions.

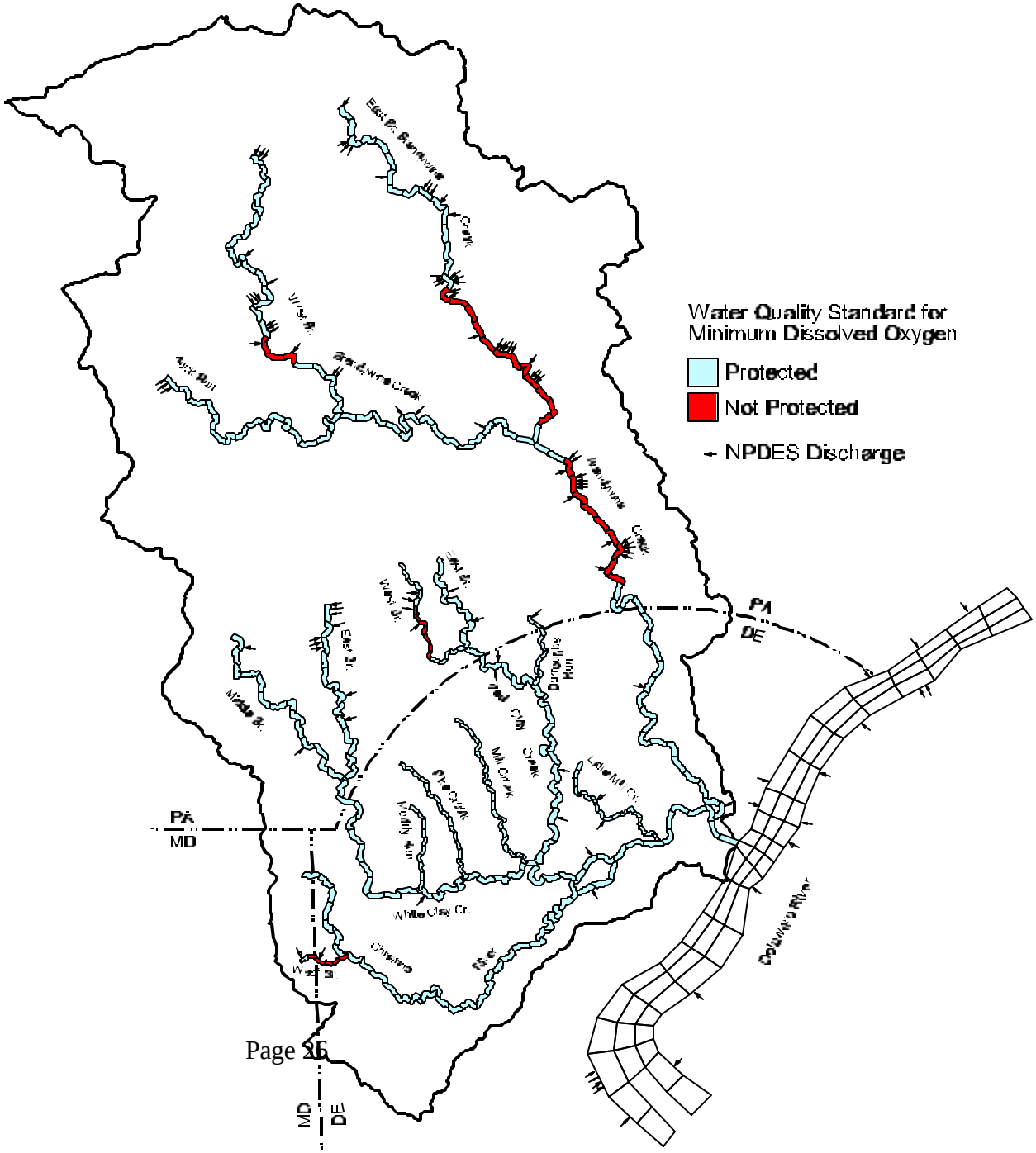


Figure 10. Applicable use designations for stream segments in the Christina River Basin

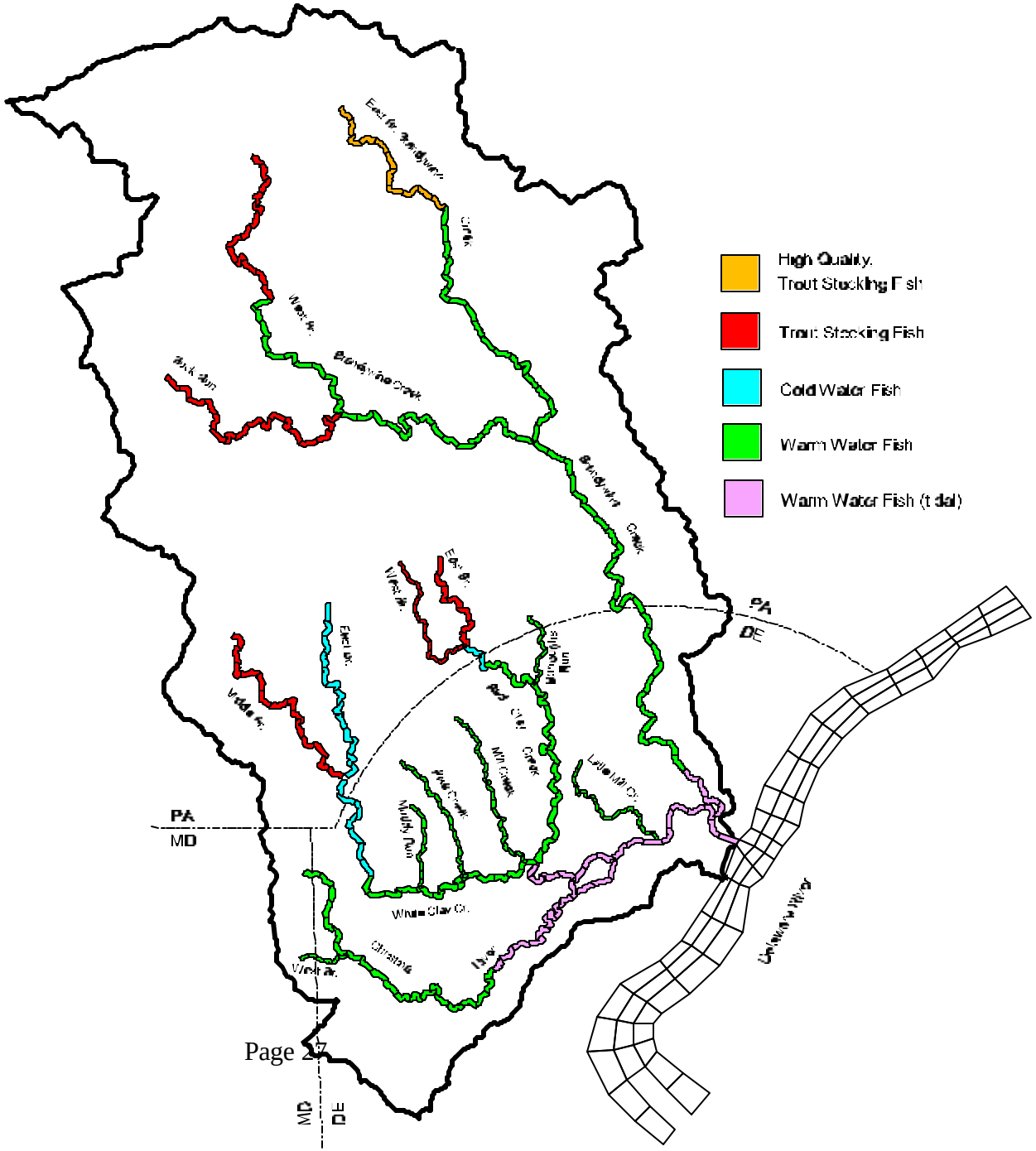


Figure 11. Modeled stream segments which violate daily average dissolved oxygen water quality criteria based on the Level 1 allocation analysis.

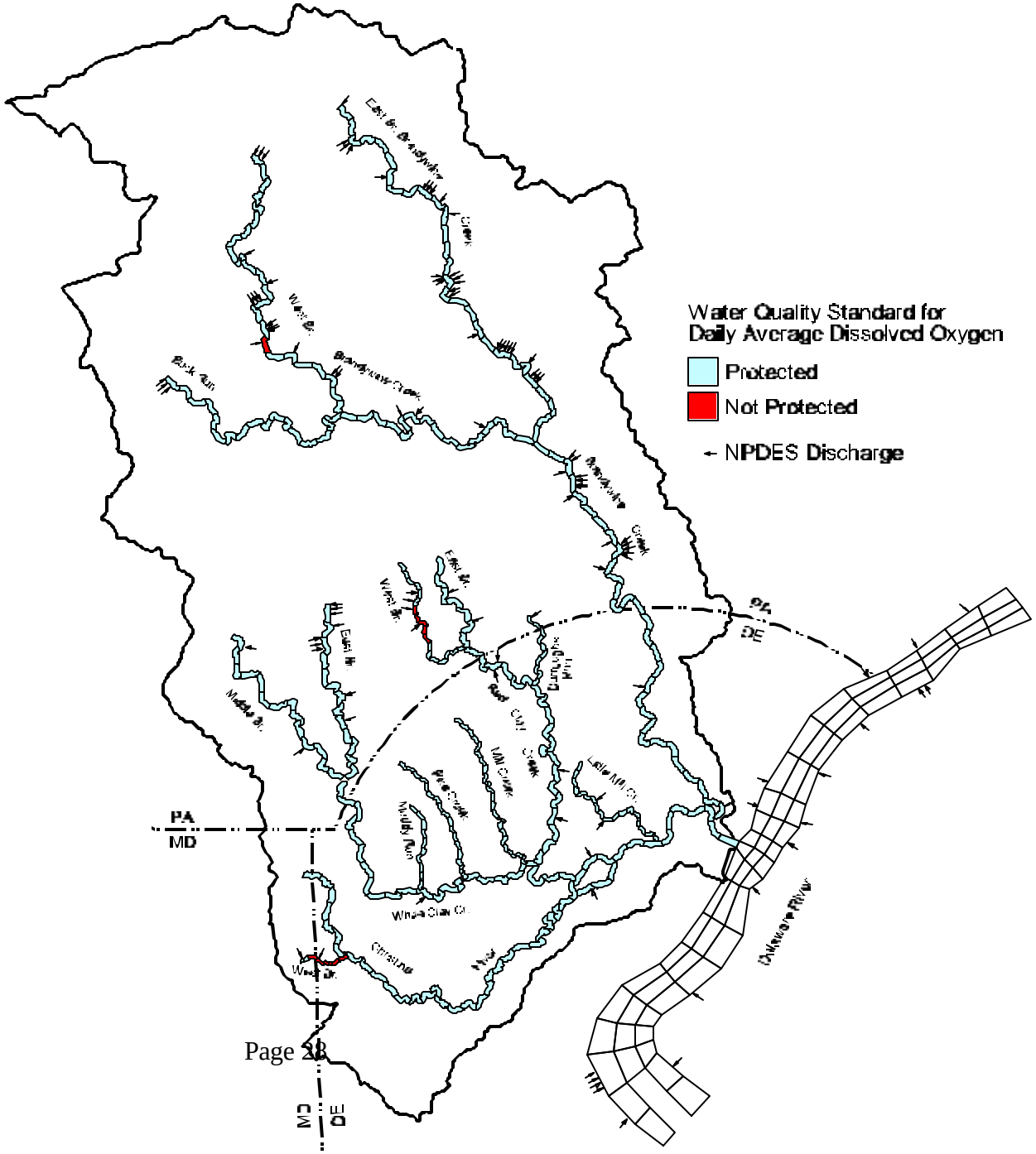


Figure 12. Modeled stream segments which violate minimum dissolved oxygen water quality criteria based on Level 1 allocation analysis.

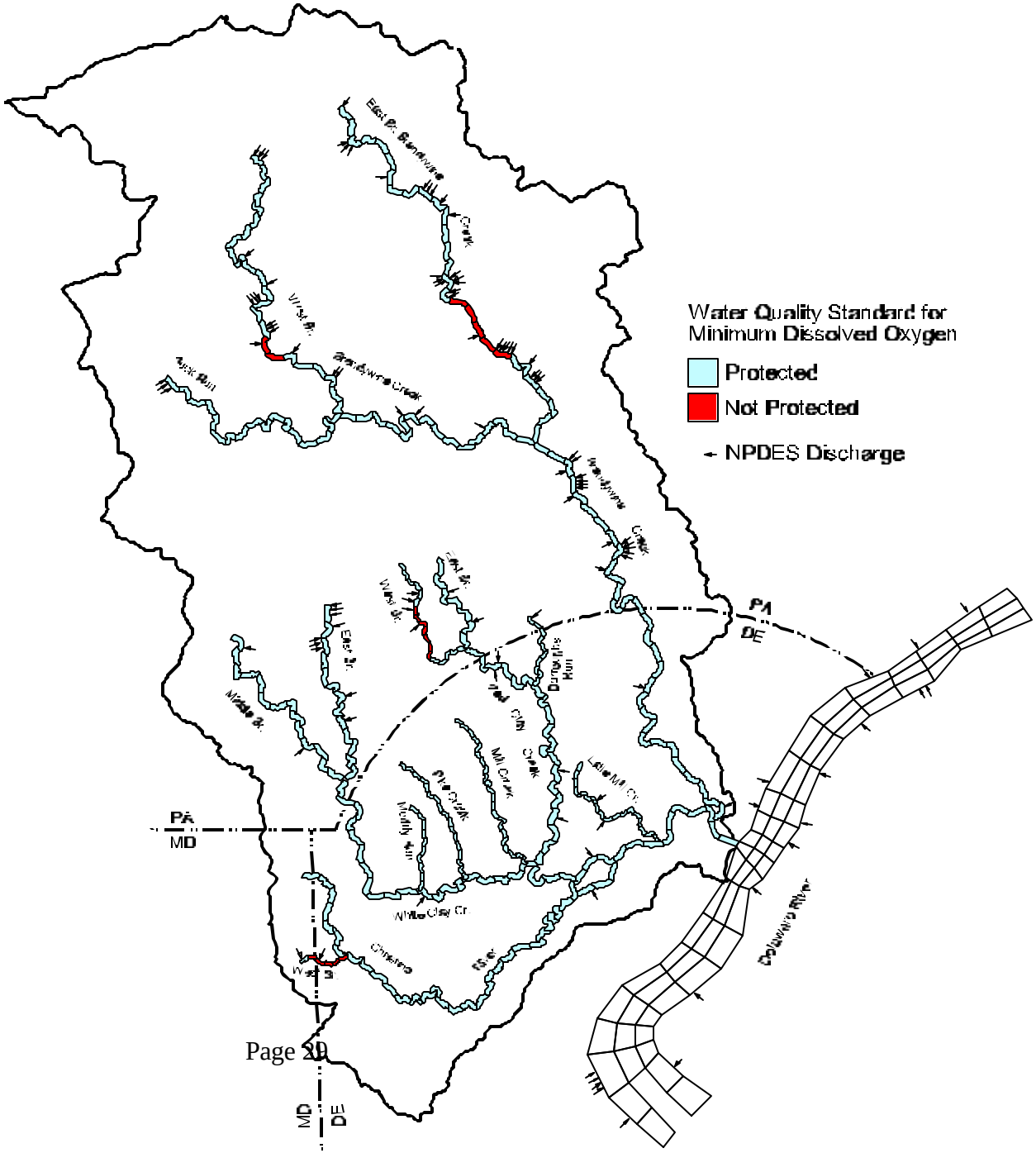
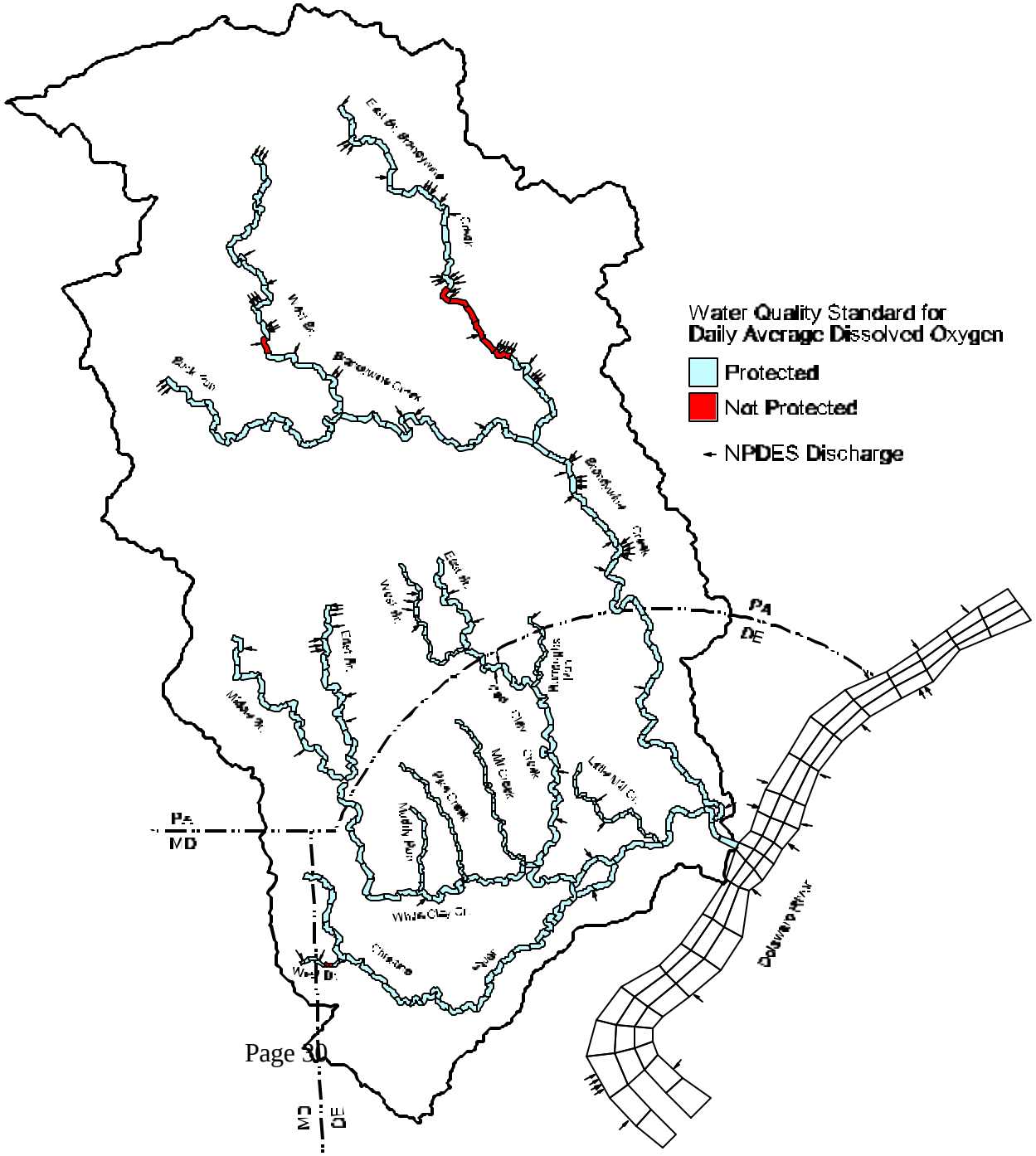


Figure 13. Modeled stream segments which violate daily average dissolved oxygen water quality criteria based on Level 2 allocation analysis.



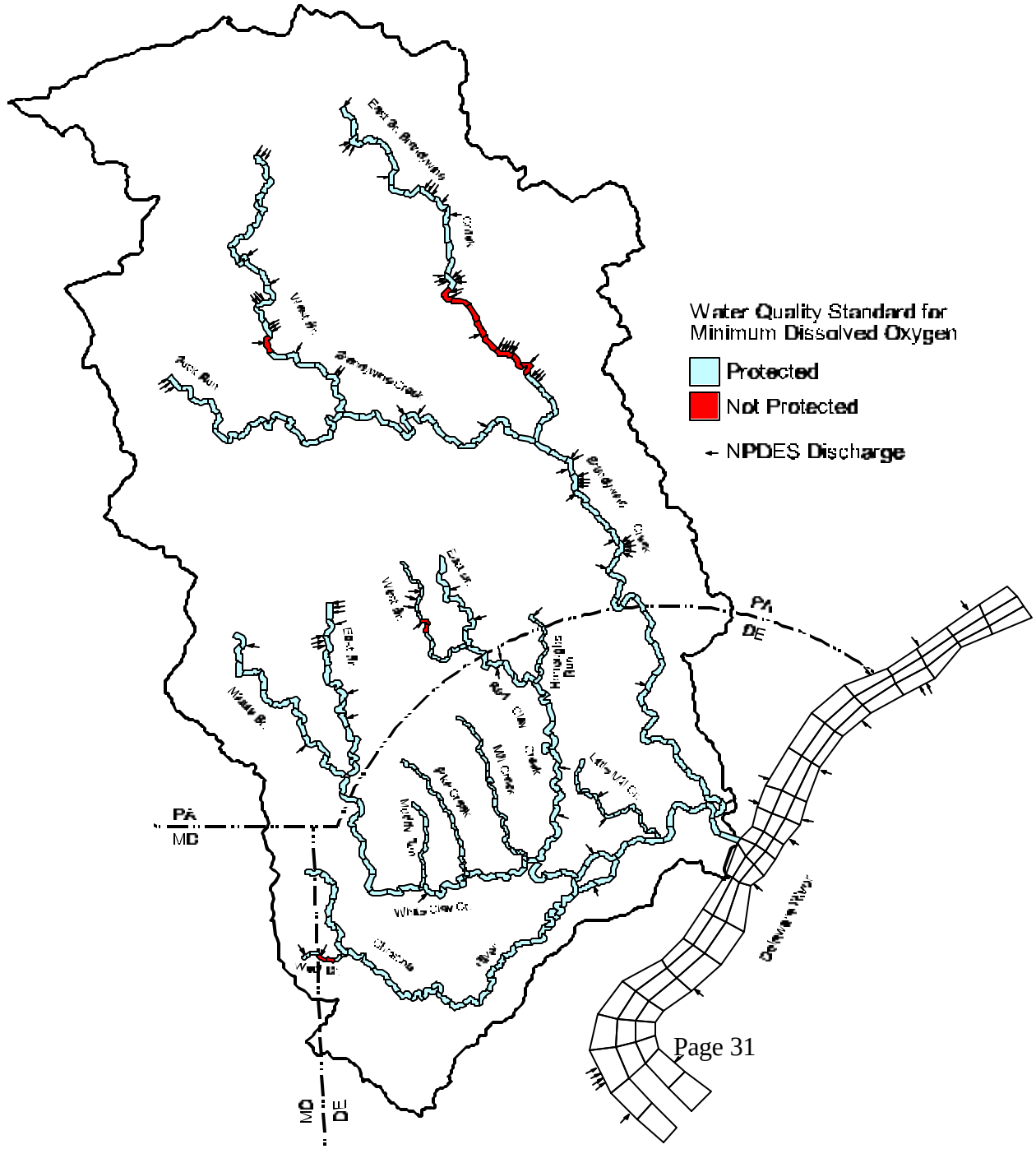


Figure 14. Modeled stream segments which violate minimum dissolved oxygen water quality criteria based on Level 2 allocation analysis.

Figure 15. Final Level 2 allocation analysis results which indicate no violations of daily average dissolved oxygen water quality criteria in modeled stream segments.

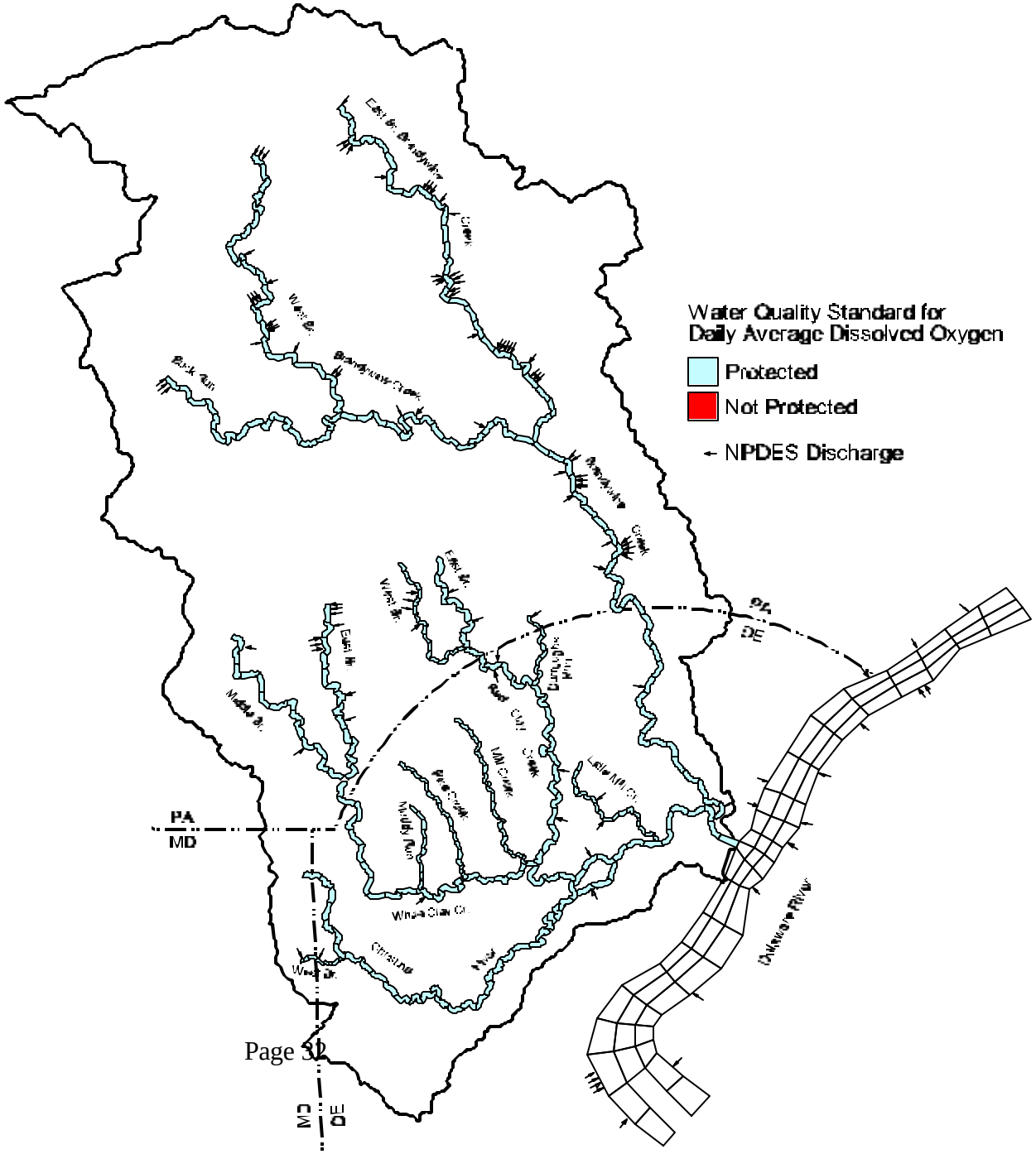
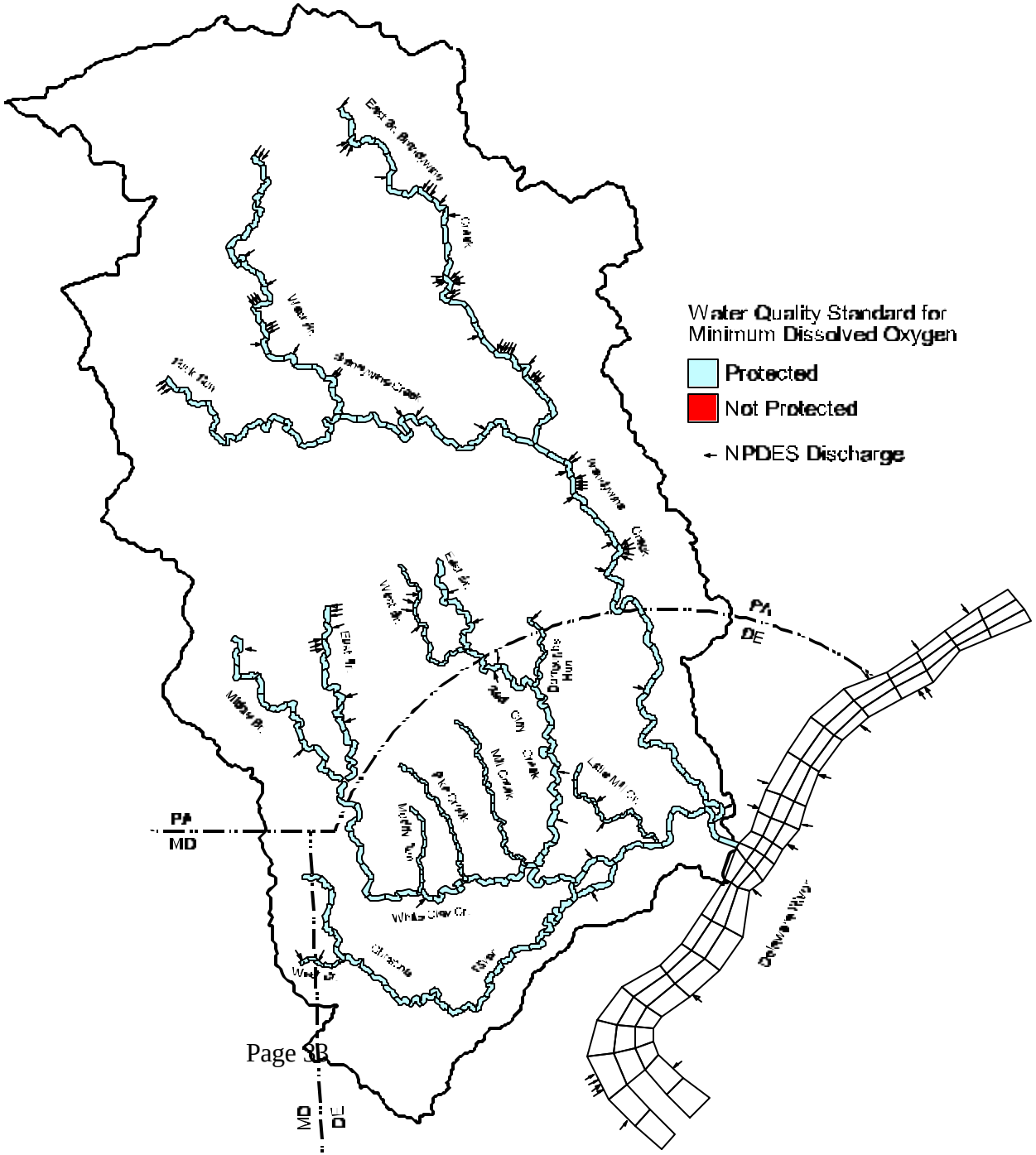



Figure 16. Final Level 2 allocation analysis results which indicate no violations of minimum dissolved oxygen water quality criteria in modeled stream segments.