Appendix A

Detailed Burden and Cost Tables

Exhibit A.1 One-Time Air Carrier Burden and Cost Estimates for Implementation Activities

Compliance Activity	Labor Cost ($/hour)	One-Time Labor Burden (hours/employee)	Unit Cost	Total Labor Burden (hours)	Total Cost ($)
	A	B	C=A*B	D=B*63	E=C*63
Read and Understand Rule	$42.86	8	$ 343	504	$ 21,600
Train Personnel	$42.86	8	$ 343	504	$ 21,600
Total		**16**	**$ 686**	**1,008**	**$ 43,201**

Notes:
(1) Detail may not add to total due to rounding.

Sources:
(A) Air carrier labor rates from Exhibit 5. EPA used the transportation inspector category because it was the highest-paid technical labor category. Transportation inspectors are assumed to have a technical background, as well as some management or oversight responsibility.
(B) Labor hours for start-up activities reflect EPA estimate.
(D), (E) National totals for all 63 U.S. air carriers subject to ADWR to perform implementation activities. Assumes all air carriers spend equal time performing implementation activities, regardless of fleet size or aircraft type.

Exhibit A.2 One-Time Agency Burden and Cost Estimates for Implementation Activities

Compliance Activity	Labor Cost ($/hour) A	One-Time Labor Burden (hours) B	Unit Cost C=A*B	Total Labor Burden (hours) D=B*10	Total Cost ($) E=C*10
Read and Understand Rule	$50.14	8	$401	80	$4,012
Program Development	$50.14	40	$2,006	400	$20,058
Modify/Develop Data Management Systems	$50.14	115	$5,767	1,150	$57,666
Air Carrier Training and Technical Assistance	$50.14	80	$4,012	800	$40,115
Staff Training	$50.14	40	$2,006	400	$20,058
Total		**283**	**$14,191**	**2,830**	**$141,908**

Notes:
(1) Detail may not add due to rounding.
Sources:
(A) Agency labor rates from Section 6(c).
(B) Labor hours for start-up activities reflect EPA estimate.

(D), (E) National totals for Agency (EPA Regions) to implement ADWR for 63 U.S. air carriers subject to ADWR. Assumes each region spends equal time performing implementation activities, regardless of number of air carriers headquartered in the region, air carrier fleet size, or aircraft type.

Exhibit A.3 Annual Agency Burden and Cost Estimates for Administrative Activities

Compliance Activity	Labor Cost ($/hour) A	Labor (hours/year) B	Cost ($/year) C=A*B	Total Labor Burden (hours/year) D=B*10	Total Cost ($/year) E=C*10
Lab Certification	$50.14	-	$ -	0	$ -
Ongoing Technical Assistance	$50.14	500	$ 25,072	5,000	$ 250,720
Staff Training	$50.14	16	$ 802	160	$ 8,023
Total		**516**	**$ 25,874**	**5,160**	**$ 258,743**

Notes:
(1) Detail may not add to total due to rounding.
(3) No costs are associated with lab certification under the ADWR because it is not anticipated that the Agency will need to oversee lab certification programs in addition to what is being done for the Total Coliform Rule.
(A) Agency labor rates from Section 6(c).
(B) Labor hours for start-up activities reflect EPA estimate.
(D), (E) National totals for Agency (EPA Regions) to implement ADWR for 63 U.S. air carriers subject to ADWR. Assumes each region spends equal time performing implementation activities, regardless of number of air carriers headquartered in the region, air carrier fleet size, or aircraft type.

Exhibit A.4 One-Time Air Carrier Burden and Cost Estimate for Developing a Sampling Plan

Compliance Activity	Labor Cost ($/hour)	One-Time Labor Burden (hours/employee)	Unit Cost	Total Labor Burden (hours)	Total Cost ($)
	A	B	C=A*B	D=B*63	E=C*63
Develop Sampling Plan per ADWR requirements and Report Sampling Frequency	$42.86	10	$ 429	630	$ 27,001
Total		**10**	**$ 429**	**630**	**$ 27,001**

Notes:

One-time labor burden for sampling plan includes initial submission of air carrier inventory information.

Sources:

(A) Air carrier labor costs from Exhibit 5.1. EPA used the transportation inspector category because it was the highest-paid technical labor category. Transportation inspectors are assumed to have a technical background, as well as some management or oversight responsibility.

(B) Labor hours for developing sampling plans and reporting sampling frequency reflect EPA estimate. Assumes both disinfection and flushing frequency and monitoring frequency will be reported in plan.

(D), (E) Assume all of the 63 U.S. air carriers subject to ADWR will develop sampling plans. Assumes all air carriers spend equal time developing sampling plans, regardless of fleet size or aircraft type.

Exhibit A.5 One-Time Agency Burden and Cost Estimate for Reviewing Sampling Plan Information

Compliance Activity	Labor Cost ($/hour)	One-Time Labor Burden (hours/employee)	Unit Cost	Total Labor Burden (hours)	Total Cost ($)
	A	B	C=A*B	D=B*63	E=C*63
Review Air Carrier Sampling Plan Information and Flushing and Disinfection Frequency	$50.14	4.5	$ 226	284	$ 14,216
Total		**4.5**	**$ 226**	**284**	**$ 14,216**

Notes:
One-time labor burden for sampling plan includes reviewing initial submission of air carrier inventory information.
Sources:
(A) Agency labor rates from Section 6(c).
(B) Labor hours for reviewing sampling plan information and flushing/disinfection frequency reflect EPA estimate.
(D), (E) Assume all of the 63 U.S. air carriers subject to ADWR will develop sampling plans. Assumes Agency spends equal time reviewing air carrier sampling plan information, regardless of fleet size or aircraft type.

Exhibit A.6 One-Time Air Carrier Burden and Cost Estimate for Developing an O&M Plan

Compliance Activity	Labor Cost ($/hour)	One-Time Labor Burden (hours/employee)	Unit Cost	Total Labor Burden (hours)	Total Cost ($)
	A	B	C=A*B	D=B*63	E=C*63
Update O&M manual with ADWR-specific requirements	$42.86	80	$ 3,429	5,040	$ 216,005
Total		**80**	**$ 3,429**	**5,040**	**$ 216,005**

Sources:

(A) Air carrier labor rates from Exhibit 5. EPA used the transportation inspector category because it was the highest-paid technical labor category. Transportation inspectors are assumed to have a technical background, as well as some management or oversight responsibility.

(B) Labor hours for developing and implementing O&M plan and submitting verification statement to Agency reflect EPA estimate.

(D), (E) 63 U.S. air carriers subject to ADWR will develop O&M plans. Assumes all air carriers spend equal time developing and implementing O&M plan, regardless of fleet size or aircraft type.

Exhibit A.7 One-Time Agency Burden and Cost Estimate for Reviewing Notification on Air Carrier O&M Plan

Compliance Activity	Labor Cost ($/hour)	One-Time Labor Burden (hours/employee)	Unit Cost	Total Labor Burden (hours)	Total Cost ($)
	A	B	C=A*B	D=B*63	E=C*63
Review system notification that O&M manual has been updated	$50.14	0.5	$ 25	32	$ 1,580
Total		**0.5**	**$ 25**	**32**	**$ 1,580**

Notes:

(A) Agency labor rates from Section 6(c).

(B) Labor hours for reviewing verification statement reflect EPA estimate. Assumes O&M plan review will be completed as part of compliance audits.

(D), (E) 63 U.S. air carriers subject to ADWR will develop O&M plans.

Exhibit A.8 Annual Air Carrier Burden and Cost Estimate for Total Coliform Monitoring, Sampling, Analysis, Reporting, and Recordkeeping

			Total Coliform Monitoring						TC Sampling			Analysis					
# of Available Sampling Points	# of Aircraft	Total # of Available Sampling Points	Routine Monitoring Coliform Samples (samples/year)	Routine Monitoring Total Coliform Positive Samples (samples/year)	Additional Aircraft with Total Coliform Positive Samples (aircraft/year)	Routine Monitoring Repeat Samples (samples/year)	Additional Routine Monitoring Coliform Samples (samples/year)	Corrective Action Coliform Verification Sample (Post-Disinfection Sample) (samples/year)	Sampling Labor Burden (hours/sample)	Total Sampling Burden (hours/year)	Total Sampling Cost ($/year)	Analysis Labor Burden (hours/sample)	Total Analysis Burden (hours/year)	Unit Shipping Cost ($/sample set)	Total Shipping Cost ($/year)	Unit Analysis Cost ($/year)	Total Analysis Cost ($/year)
A	B	C=B*A	D	E=D*0.036	F	G	H	I	J	K=J(D+G+H+I)	L=K*AA	M	N=M(D+G+H+I)	O	P=O(D/2+G/3+H+I/2)	Q	R=Q(D+G+H+I)
1	381	381	2,515	91	5	95	0	129	0.5	1,369	$ 46,922	0	-	$107	145,446	$22.16	60,682
2	2,080	4,160	13,728	494	30	518	0	702	0.5	7,474	$ 256,164	0	-	$107	794,034	$22.16	331,283
3	756	2,268	4,990	180	11	188	0	255	0.5	2,717	$ 93,106	0	-	$107	288,601	$22.16	120,409
4	421	1,684	2,779	100	6	105	0	142	0.5	1,513	$ 51,849	0	-	$107	160,716	$22.16	67,053
5	956	4,780	6,310	227	14	238	0	323	0.5	3,435	$ 117,737	0	-	$107	364,950	$22.16	152,263
6	871	5,226	5,749	207	12	217	0	294	0.5	3,130	$ 107,269	0	-	$107	332,502	$22.16	138,725
7	298	2,086	1,967	71	4	74	0	101	0.5	1,071	$ 36,700	0	-	$107	113,761	$22.16	47,463
8	809	6,472	5,339	192	11	201	0	273	0.5	2,907	$ 99,633	0	-	$107	308,833	$22.16	128,850
≥ 9	755	9,354	4,983	179	11	188	0	255	0.5	2,713	$ 92,983	0	-	$107	288,219	$22.16	120,249
Total	**7,327**	**36,411**	**48,358**	**1,741**	**104**	**1,823**	**0**	**2,474**		**26,328**	**902,363**		**0**	**$ -**	**$ 2,797,061**	**$ -**	**$ 1,166,977**

Notes:

(C) For aircraft with 9 or more sampling points, the average number of sampling points on aircraft in this category was used to calculate the total number of available sampling points.

(D) One galley and one lavatory total coliform sample collected per aircraft. Assume 30% of aircraft will sample annually, 30% of aircraft will sample twice annually, 30% of aircraft will sample quarterly, and 10% of aircraft will sample monthly. Assumes no more than one TC+ sample per aircraft.

(E) Assume 3.6% of coliform samples will be TC+ based on AOC data. Assume each aircraft has no more than one positive sample.

(F) For aircraft with initial TC+ samples, assume 0% of aircraft performing annual routine monitoring, 0% of aircraft performing twice annual routine monitoring, 50% of aircraft performing quarterly routine monitoring, and 46% of aircraft performing monthly routine monitoring will perform repeat sampling. Assume 5.7% of aircraft performing repeat sampling will have one additional TC+ sample (based on AOC data).

(G) For aircraft with initial TC+ routine sample, assume 0% of aircraft performing annual routine monitoring, 0% of aircraft performing twice annual monitoring, 50% of aircraft performing quarterly monitoring, and 46% of aircraft performing monthly monitoring will collect three repeat samples within 24 hours of notification of TC+ as an alternative to immediate corrective action. Assume aircraft with less than three sampling points collect a total of 300 mL of samples from all available sampling points.

(H) Additional routine coliform monitoring not specified, assumed no additional routine coliform samples collected.

(I) Assume 100% of aircraft performing annual and twice annual routine monitoring, 50% of aircraft performing quarterly monitoring, and 54% of aircraft performing monthly will collect two follow-up samples after undergoing corrective action disinfection and flushing.

(J) Assume 0.5 hour for sample collection and for processing, storage, and shipping of sample. (Sample set burden is 1 hour for (2) routine samples, 1.5 hours for (3) repeat samples, and 1 hour for (2) corrective action follow-up samples.)

(M) Assume all analysis conducted by outside lab.

(O) Estimated courier fees based on costs from various courier services in major cities. Assumed courier services required for each sample set. (Sample set consists of 2 routine samples, 3 repeat samples, or 2 corrective action follow-up samples.) Assumed airport distance of 20-30 miles from lab. Assumed courier would return cooler to air carrier.

(Q) Average coliform analysis costs based on costs from various labs across the country (fall 2006 data, updated to 2008 dollars). Assume all analysis conducted by outside lab.

Exhibit A.8 Annual Air Carrier Burden and Cost Estimate for Total Coliform Monitoring, Sampling, Analysis, Reporting, and Recordkeeping (continued)

			Analysis				Recordkeeping							Totals		
# of Available Sampling Points	# of Aircraft	Total # of Available Sampling Points	Annual Unit Equipment Cost ($/air carrier/year)	Total Annual Equipment Cost ($/year)	Periodic Equipment Cost ($/air carrier)	Periodic Equipment Cost	Maintain Maintenance Log (hours/sample set)	Report Monitoring Results (hours/sample set)	Report Water System Inventory/ Changes (hours/air carrier)	Report Water System Inventory/ Changes Burden (hours/year)	Labor Cost ($/hour)	Recordkeeping and Reporting Labor (hours/year)	Reporting and Recordkeeping Cost ($/year)	Total Burden (hours/year)	Total O&M Cost ($/year)	Total Capital Cost ($)
A	B	C=B*A	S	T	U	V	W	X	Y	Z	AA	AB=((W+X)* (D/2+G/3+H+I/2))+Z	AC=AB*AA	AD=K+M+AB	AE=L+P+R+T+AC	AF=V
1	381	381	$ 219	$ 717	$ 597	$ 1,956	0.25	0.25	1.00	3.28	$34.27	680	$ 23,303	2,049	$ 277,070	$ 1,956
2	2,080	4,160	$ 219	$ 3,917	$ 597	$ 10,677	0.25	0.25	1.00	17.88	$34.27	3,712	$ 127,217	11,186	$ 1,512,615	$ 10,677
3	756	2,268	$ 219	$ 1,424	$ 597	$ 3,881	0.25	0.25	1.00	6.50	$34.27	1,349	$ 46,238	4,066	$ 549,777	$ 3,881
4	421	1,684	$ 219	$ 793	$ 597	$ 2,161	0.25	0.25	1.00	3.62	$34.27	751	$ 25,749	2,264	$ 306,159	$ 2,161
5	956	4,780	$ 219	$ 1,800	$ 597	$ 4,907	0.25	0.25	1.00	8.22	$34.27	1,706	$ 58,471	5,141	$ 695,221	$ 4,907
6	871	5,226	$ 219	$ 1,640	$ 597	$ 4,471	0.25	0.25	1.00	7.49	$34.27	1,554	$ 53,272	4,684	$ 633,407	$ 4,471
7	298	2,086	$ 219	$ 561	$ 597	$ 1,530	0.25	0.25	1.00	2.56	$34.27	532	$ 18,226	1,603	$ 216,711	$ 1,530
8	809	6,472	$ 219	$ 1,523	$ 597	$ 4,153	0.25	0.25	1.00	6.96	$34.27	1,444	$ 49,480	4,351	$ 588,320	$ 4,153
≥ 9	755	9,354	$ 219	$ 1,422	$ 597	$ 3,876	0.25	0.25	1.00	6.49	$34.27	1,347	$ 46,177	4,060	$ 549,050	$ 3,876
Total	**7,327**	**36,411**	**$ -**	**$ 13,797**	**$ -**	**$ 37,611**				**63**			**$ 448,133**	**39,403**	**$ 5,328,330**	**$ 37,611**

Notes:

(S) Assume air carriers will replace coolers, gel packs, and thermometers once a year.

(T) Coolers, gel packs, and thermometers are purchased by air carriers. The costs for this equipment are assumed to be distributed evenly across the 7,327 aircraft.

(U) Assume each air carrier will purchase three new refrigerators.

(V) Refrigerators are purchased by air carriers. Assume costs for 63 air carriers are distributed evenly across the 7,327 aircraft.

(W), (X), (Y) Based on EPA estimate. Maintaining the maintenance log consists of recording all samples taken.

(Y) Air carriers must report their water system inventory within 18 months of promulgation of the Final Rule and update that inventory annually. The initial submission of inventory information is assumed to be submitted with the sampling plan. The burden in this column reflects only the annual inventory updates.

(Z) Assume burden for 63 air carriers is distributed evenly across the 7,327 aircraft.

(AA) Based on technical labor costs for inspectors, testers, sorters, samplers, and weighers, from Exhibit 5.

(AB) Columns W and X applied on a sample set basis. Assume a sample set consists of 2 samples for routine sampling, 3 samples for repeat sampling, and 2 samples for corrective action follow-up sampling.

Exhibit A.9 Annual Agency Burden and Cost Estimate for Review of Air Carrier Total Coliform Sample Results and Inventory Maintenance

	Total Coliform Samples				
Compliance Activity	Labor Cost ($/hour)	Unit Labor Burden (hours/TC+ sample or air carrier inventory)	Unit Cost ($/TC+ sample or air carrier inventory)	Total Labor Burden (hours)	Total Cost ($)
	A	B	C=A*B	D	E
Review Aircraft Monitoring Results	$50.14	0.5	$ 25	870	$ 43,648
Review Aircraft Water System Inventory/Changes	$50.14	0.5	$ 25	**32**	$ 790
Total		**1.0**	**$ 50**	**902**	**$ 44,437**

Note: Air carriers must report their water system inventory within 18 months of promulgation and update that inventory annually. The initial submission of inventory information is assumed to be submitted with the sampling plan. The burden in this table reflects only the annual inventory updates.

Sources:

(A) Agency labor rates from Section 6(c).

(B) Labor hours for reviewing aircraft inventory data and monitoring results reflect EPA estimate. EPA estimates that, for monitoring, burden is only incurred for review of total coliform-positive samples.

(D) Total labor burden for monitoring results = unit labor burden * total number of total coliform-positive samples (Exhibit A.8, column E). Total labor burden for inventory/changes = unit labor burden * 63 air carriers.

(E) Total cost for reviewing monitoring results = unit cost * total number of total coliform-positive samples (Exhibit A.8, column E). Total cost for reviewing inventory = unit cost * total burden for reviewing inventory.

Exhibit A.10 Annual Air Carrier Burden and Cost Estimate for Recordkeeping Associated with Routine Disinfection and Flushing

			Routine Disinfection and Flushing								Recordkeeping					Totals		
# of Available Sampling Points	# of Aircraft	Total # of Available Sampling Points	Routine Disinfection and Flushing (aircraft/year)	Self-Certification (aircraft/year)	Routine Disinfection and Flushing Labor Burden (hours/aircraft)	Self-Certification Labor Burden (hours/aircraft)	Unit Disinfection and Flushing Cost ($/hour)	Unit Self-Certification Cost ($/hour)	Unit Chemical Costs ($/application)	Total Routine Disinfection and Flushing Costs ($/year)	Total Cost for Self-Certification ($/year)	Burden to Keep Log for Disinfection (hours/application)	Total Burden to Keep Log for Disinfection (hours/year)	Recordkeeping Labor Cost ($/hour)	Total Costs to Keep Log for Disinfection ($/year)	Total Routine Disinfection/Flushing Labor Burden (hours/year)	Total O&M Cost ($/year)	Total Capital Cost ($)
A	B	C=B*A	D	E	F	G	H	I	J	K=(D*F*H)+(D*J)	L=E*G*I	M	N=D*M	O	P=N*O	Q=(D*F)+(E*G) + N	R=K+L+P	S
1	381	381	1,067	0	5	0.5	$20.19	$65.42	$ 1	$108,855	$ -	0.25	267	$34.27	$ 9,141	5,601	$ 117,996	$ -
2	2,080	4,160	5,824	0	5	0.5	$20.19	$65.42	$ 1	$594,276	$ -	0.25	1,456	$34.27	$ 49,903	30,576	$ 644,180	$ -
3	756	2,268	2,117	0	5	0.5	$20.19	$65.42	$ 1	$215,997	$ -	0.25	529	$34.27	$ 18,138	11,113	$ 234,135	$ -
4	421	1,684	1,179	0	5	0.5	$20.19	$65.42	$ 1	$120,284	$ -	0.25	295	$34.27	$ 10,101	6,189	$ 130,384	$ -
5	956	4,780	2,677	0	5	0.5	$20.19	$65.42	$ 1	$273,139	$ -	0.25	669	$34.27	$ 22,936	14,053	$ 296,075	$ -
6	871	5,226	2,439	0	5	0.5	$20.19	$65.42	$ 1	$248,853	$ -	0.25	610	$34.27	$ 20,897	12,804	$ 269,750	$ -
7	298	2,086	834	0	5	0.5	$20.19	$65.42	$ 1	$85,142	$ -	0.25	209	$34.27	$ 7,150	4,381	$ 92,291	$ -
8	809	6,472	2,265	0	5	0.5	$20.19	$65.42	$ 1	$231,139	$ -	0.25	566	$34.27	$ 19,409	11,892	$ 250,549	$ -
> 9	755	9,354	2,114	0	5	0.5	$20.19	$65.42	$ 1	$215,711	$ -	0.25	529	$34.27	$ 18,114	11,099	$ 233,825	$ -
Total	**7,327**	**36,411**	**20,516**	**0**						**$2,093,396**	**$0**		**5,129**		**$ 175,789**	**107,707**	**$ 2,269,185**	**$ -**

Notes:

(C) Average number of available sampling points used for > 9 sampling points size category.

(D) Assume 30% of aircraft will perform routine disinfection and flushing quarterly, 30% of aircraft will perform routine disinfection and flushing thrice annually, 30% of aircraft will perform routine disinfection and flushing twice annually, and 10% of aircraft will perform routine disinfection and flushing annually.

(E) Self-certification submittal not required under the final rule.

(F) EPA estimate based on observation of flushing and disinfection practices.

(G) Labor hours for self-certification reflects EPA estimate.

(H) Based on labor rates for cleaners of vehicles and equipment from Exhibit 5.

(I) Based on labor rates for transportation, storage, and distribution managers from Exhibit 5.

(J) Chemicals used for disinfection cost approximately $1 per application (based on 12.5% chlorine solution from Harcros Chemicals, which costs $12 per 4 gallon jugs).

(M) Based on EPA estimate. Consists of recording disinfection activities in the log.

(O) Based on technical labor rates for inspectors, testers, sorters, samplers, and weighers, from Exhibit 5.

Exhibit A.11 Annual Air Carrier Burden and Cost Estimate for Recordkeeping Associated with Corrective Action Disinfection and Flushing

			Corrective Action Disinfection and Flushing						Recordkeeping				Totals		
# of Available Sampling Points	# of Aircraft	Total # of Available Sampling Points	Corrective Action Disinfection and Flushing (aircraft/year)	Repeat Disinfection and Flushing (aircraft/year)	Corrective Action Disinfection and Flushing Labor Burden (hours/aircraft)	Unit Disinfection and Flushing Cost ($/hour)	Unit Chemical Costs ($/application)	Total Corrective Action Disinfection and Flushing Costs ($/year)	Maintain Maintenance Log for Disinfection Activities Burden (hours/aircraft)	Maintain Maintenance Log for Disinfection Activities Burden (hours/year)	Recordkeeping Labor Cost ($/hour)	Maintain Maintenance Log for Disinfection Activities Costs ($/year)	Total Corrective Action Disinfection/ Flushing Labor Burden (hours/year)	Total O&M Cost ($/year)	Total Capital Cost ($)
A	B	C=B*A	D	E	F	G	H	I=((D+E)*(F*G)) +(D+E)*H)	J	K	L	M=K*L	N=((D+E)*F)+K	O=I+M	P
1	381	381	21	0	5	$20.19	$ 1	$2,097	0.25	16	$34.27	$ 551	119	$ 2,648	$ -
2	2,080	4,160	112	0	5	$20.19	$ 1	$11,446	0.25	88	$34.27	$ 3,009	649	$ 14,455	$ -
3	756	2,268	41	0	5	$20.19	$ 1	$4,160	0.25	32	$34.27	$ 1,094	236	$ 5,254	$ -
4	421	1,684	23	0	5	$20.19	$ 1	$2,317	0.25	18	$34.27	$ 609	131	$ 2,926	$ -
5	956	4,780	52	0	5	$20.19	$ 1	$5,261	0.25	40	$34.27	$ 1,383	298	$ 6,644	$ -
6	871	5,226	47	0	5	$20.19	$ 1	$4,793	0.25	37	$34.27	$ 1,260	272	$ 6,053	$ -
7	298	2,086	16	0	5	$20.19	$ 1	$1,640	0.25	13	$34.27	$ 431	93	$ 2,071	$ -
8	809	6,472	44	0	5	$20.19	$ 1	$4,452	0.25	34	$34.27	$ 1,170	252	$ 5,622	$ -
> 9	755	9,354	41	0	5	$20.19	$ 1	$4,155	0.25	32	$34.27	$ 1,092	235	$ 5,247	$ -
Total	**7,327**	**36,411**	**395**	**0**				**$40,318**		309		$ 10,600	**2,285**	**$ 50,918**	**$ -**

Notes:

(C) Average number of available sampling points used for > 9 sampling points size category.

and 54% of aircraft performing monthly routine monitoring will perform corrective disinfection and flushing after a positive routine total coliform sample. Assume the remainder of aircraft with a TC+ sample will perform repeat sampling. Assume 5.7% of aircraft performing repeat sampling will have at least one additional TC+ sample and will perform corrective action. Additionally, of the aircraft with routine TC+ samples, assume 0% of the 100% of aircraft monitoring annually, 0% of the 100% of aircraft monitoring twice annually, 0% of the 50% of aircraft monitoring quarterly, and 46% of aircraft monitoring monthly will incur costs for corrective action disinfection and flushing. Remainder of aircraft performing corrective disinfection and flushing are assumed to coordinate corrective action with routine disinfection and flushing schedule, and therefore do not incur separate costs for corrective disinfection and flushing. Assume entire aircraft is flushed if either lavatory or galley has a positive total coliform sample. Assume no more than one TC+ per aircraft.

(E) Assumes first flushing/disinfecting is successful.

(F) EPA estimate based on observation of flushing and disinfection practices.

(G) Based on labor rates for cleaners of vehicles and equipment from Exhibit 5.

(H) Chemicals used for disinfection cost approximately $1 per application (based on 12.5% chlorine solution from Harcros Chemicals, which costs $12 per 4 gallon jugs).

(J) Based on EPA estimate. Includes recording disinfection activities in maintenance log.

(K), (M) Recordkeeping burden and costs based on total number of corrective action disinfection and flushing events plus repeat disinfection and flushing events. Total number of corrective action disinfection and flushing events is from Exhibit A.8, column I.

Exhibit A.12 Air Carrier Burden and Cost Estimate for Self-Inspection Reporting and Recordkeeping

		Reporting and Recordkeeping Costs Associated with Self-Inspection of Aircraft PWS			Totals		
# of Available Sampling Points	# of Aircraft	Total # of Available Sampling Points	Unit Labor Cost ($/hour)	Unit Labor Burden (hours/air carrier)	Total Labor Burden (hours/audit cycle)	Total Labor Cost ($/audit cycle)	Total Capital Cost ($)
A	B	C=B*A	D	E	F	G=D*F	H
1	381	381	$42.86	24.0	79	$ 3,370	$ -
2	2,080	4,160	$42.86	24.0	429	$ 18,396	$ -
3	756	2,268	$42.86	24.0	156	$ 6,686	$ -
4	421	1,684	$42.86	24.0	87	$ 3,723	$ -
5	956	4,780	$42.86	24.0	197	$ 8,455	$ -
6	871	5,226	$42.86	24.0	180	$ 7,703	$ -
7	298	2,086	$42.86	24.0	61	$ 2,636	$ -
8	809	6,472	$42.86	24.0	167	$ 7,155	$ -
≥ 9	755	9,354	$42.86	24.0	156	$ 6,677	$ -
Total	**7,327**	**36,411**			**1,512**	**$ 64,801**	**$ -**

Sources:

(D) Air carrier labor rates from Exhibit 5. EPA used the transportation inspector category because it was the highest-paid technical labor category. Transportation inspectors are assumed to have a technical background, as well as some management or oversight responsibility.

(E) Labor burden reflects EPA estimate for reporting and recordkeeping only. EPA assumes that air carriers already conduct major maintenance checks, which include self-inspection components, every five years for each aircraft. Therefore, with the exception of reporting and recordkeeping burden, no additional costs for self-inspections are incurred by air carriers under the ADWR. Reporting requirements include certification that self-inspections have been completed, notification of any deficiencies detected during self-inspections, along with corrective actions taken, and any other reporting and recordkeeping needed to prepare for compliance audits by EPA.

(F), (G) All aircraft undergo compliance audits once in 5 years. The Agency will review electronic data for all aircraft at the airline office site. Assumes labor burden for self-inspection reporting and recordkeeping is evenly distributed across the 63 airlines.

Exhibit A.13 Agency Burden and Cost Estimate for Conducting Compliance Audits of Air Carrier PWSs

Compliance Activity	Labor Cost ($/hour)	Unit Labor Burden (hours/air carrier)	Unit Cost ($/air carrier)	Total Labor Burden (hours/audit cycle)	Total Labor Cost ($/audit cycle)
	A	B	C=A*B	D=B*63	E=C*63
Conducting Compliance Audit of Aircraft PWSs	$50.14	16	$ 802	1,008	$ 50,545
Total		**16**	**$ 802**	**1,008**	**$ 50,545**

Sources:

(A) Agency labor rates from Section 6(c).

(B) Labor hours for conducting compliance audits reflect EPA estimate.

(D), (E) Total burden and O&M costs for conducting compliance audits for 63 U.S. air carriers subject to ADWR. All aircraft undergo compliance audits once in 5 years.

Exhibit A.14 Air Carrier Burden and Cost Estimate for Public Notification

			Total Coliform-Positive Samples				E. coli-Positive Samples									
# of Available Sampling Points	# of Aircraft	Total # of Available Sampling Points	Total Number of Aircraft Conducting Corrective Action Associated with TC+ Samples	Number of Unique Corrective Actions Associated with TC+ Samples	Percentage of Aircraft Restricting Public Access Following TC+ Samples	Aircraft Conducting PN Following TC+ Sample	Number of Routine Samples	Number of Routine Samples Positive for *E. coli*	Total Number of Aircraft Conducting PN	Labor Burden per PN Event (hours)	Total PN Burden (hours)	Labor Rate ($/hour)	Total Labor Cost	O&M Cost	Capital Cost	Total Cost
A	B	C=B*A	D	E	F	G=E*F	H	I=H*0.0014	J=G+I	K	L=J*K	M	N=L*M	O	P	Q=N+O+P
1	381	381	64	21	50%	10	2,515	4	14	3.5	48	$65.42	$3,158	$0	$0	$3,158
2	2,080	4,160	351	112	50%	56	13,728	19	75	3.5	264	$65.42	$17,241	$0	$0	$17,241
3	756	2,268	128	41	50%	20	4,990	7	27	3.5	96	$65.42	$6,267	$0	$0	$6,267
4	421	1,684	71	23	50%	11	2,779	4	15	3.5	53	$65.42	$3,490	$0	$0	$3,490
5	956	4,780	161	52	50%	26	6,310	9	35	3.5	121	$65.42	$7,924	$0	$0	$7,924
6	871	5,226	147	47	50%	23	5,749	8	32	3.5	110	$65.42	$7,220	$0	$0	$7,220
7	298	2,086	50	16	50%	8	1,967	3	11	3.5	38	$65.42	$2,470	$0	$0	$2,470
8	809	6,472	137	44	50%	22	5,339	7	29	3.5	103	$65.42	$6,706	$0	$0	$6,706
≥ 9	755	9,354	127	41	50%	20	4,983	7	27	3.5	96	$65.42	$6,258	$0	$0	$6,258
Total	**7,327**	**36,411**	**1,237**	**395**		**198**	**48,358**	**68**	**265**		**928**		**$60,734**	**$0**	**$0**	**$60,734**

Notes:

(D) Derived from column I, Exhibit A.8, which calculates number of followup samples following corrective action. Each aircraft with a total coliform-positive sample takes two followup samples after completing corrective action.

(E) From column D, Exhibit A.11. Includes only those corrective actions that do not overlap with routine disinfection and flushing. Assumes a one-to-one correspondence between corrective action and aircraft.

(F) EPA assumption. Air carriers that choose to take longer than 72 hours to conduct corrective action must restrict public access and provide public notification.

(G) Assumes each aircraft has no more than one TC+ sample.

(H) From column D, Exhibit A.8.

(I) Percentage of routine samples positive for *E. coli* from AOC data. All air carriers with positive *E. coli* samples must restrict public access and provide public notification on the affected aircraft. Note that E. coli-positive repeat samples also trigger the same requirements; however they occur so rarely that they do not significantly affect the number of PN events, so they were not included.

(J) Note that a sample can be positive for both total coliform and *E. coli* at the same time. By accounting for each type of sample separately, EPA may be overestimating the number of events requiring public notification. However, they must be accounted for separately, because the public notification requirements vary for each.

(K) EPA estimate, based on burden for preparing a Tier 2 public notice in the Public Water System Supervision ICR. Includes time needed to prepare notice for crew, post placard for passengers (where required), and report to EPA.

(M) Loaded labor rate for transportation, storage, and distribution managers from Exhibit 5.

Exhibit A.15 Agency Burden and Cost Estimate for Public Notification

	Public Notification					
Compliance Activity	Labor Cost ($/hour)	Unit Labor Burden (hours/event)	Unit Cost ($/event)	Number of PN Events	Total Labor Burden (hours/year)	Total Cost ($/year)
	A	B	C=A*B	D	E=B*D	F=C*D
Review Information Associated with Aircraft Public Notification	$50.14	0.5	$ 25	265	133	$ 6,651
Total					**133**	**$ 6,651**

Notes:

(A) Agency labor rates from Section 6(c).

(B) EPA estimate.

(D) From column J, Exhibit A.14. Assumes no more than one PN event per aircraft.

Exhibit A.16 Total Burden Incurred During the First 12 Years After ADWR Promulgation

Year	Agency Implementation	Air Carrier Implementation	Agency Annual Administration	Agency Sampling Plan Information Review	Air Carrier Sampling Plan	Monitoring - TC Agency Oversight	Monitoring TC - Air Carriers	O&M Plan Completion-Agency Review	O&M Plan-Air Carriers	Routine Disinfection & Flushing - Agency	Routine Disinfection & Flushing Recordkeeping - Air Carriers	Corrective Action Disinfection & Flushing Recordkeeping - Air Carriers	Self-Inspection Reporting and Recordkeeping Air Carriers	Compliance Audit-Agency	Public Notification - Air Carriers	Public Notification - Agency
1	1,415	504	-	142	315	-	-	16	2,520	-	-	-	-	-	-	-
2	1,415	504	-	142	315	-	-	16	2,520	-	-	-	-	-	-	-
3	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
4	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
5	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
6	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
7	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
8	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
9	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
10	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
11	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
12	-	-	5,160	-	-	902	39,403	-	-	-	5,129	309	302	202	928	133
Total	**2,830**	**1,008**	**51,600**	**284**	**630**	**9,019**	**394,027**	**32**	**5,040**	**-**	**51,289**	**3,093**	**3,024**	**2,016**	**9,284**	**1,326**

Exhibit A.17 Total Cost Incurred During First 12 Years After ADWR Promulgation

Year	Agency Implementation	Air Carrier Implementation	Agency Annual Administration	Agency Monitoring Plan	Air Carrier Monitoring Plan	Monitoring - TC Agency Oversight	Monitoring - TC Air Carriers Labor	Monitoring -TC Air Carriers O&M	Monitoring -TC Air Carriers Capital	O&M Plan Completion Agency Review	O&M Plan Air Carriers	Routine Disinfection & Flushing Recordkeeping - Agency	Routine Disinfection & Flushing Recordkeeping - Air Carriers	Corrective Action Disinfection & Flushing Recordkeeping - Air Carriers	Self-Inspection Reporting and Recordkeeping Air Carriers	Compliance Audit - Agency	Public Notification - Air Carriers	Public Notification - Agency
1	$ 70,954	$ 21,600	$ -	$ 7,108	$ 13,500	$ -	$ -	$ -	$ -	$ 790	$ 108,002	$ -	$ -	$ -	$ -	$ -	$0	$0
2	$ 70,954	$ 21,600	$ -	$ 7,108	$ 13,500	$ -	$ -	$ 1,180,774	$ -	$ 790	$ 108,002	$ -	$ -	$ -	$ -	$ -	$0	$0
3	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ 4,179	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
4	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
5	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
6	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
7	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
8	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
9	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
10	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
11	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
12	$ -	$ -	$ 258,743	$ -	$ -	$ 44,437	$ 1,350,496	$ 3,977,835	$ -	$ -	$ -	$ -	$ 175,789	$ 10,600	$ 12,960	$ 10,109	$60,734	$6,651
Total	**$ 141,908**	**$ 43,201**	**$ 2,587,430**	**$ 14,216**	**$ 27,001**	**$ 444,375**	**$ 13,504,958**	**$ 40,959,121**	**$ 4,179**	**$ 1,580**	**$ 216,005**	**$ -**	**$ 1,757,887**	**$ 106,000**	**$ 129,603**	**$ 101,090**	**$ 607,337**	**$ 66,507**

Note: Air carriers conducting monitoring will incur capital costs for refrigerators in years 3 and 13. Assumes air carriers will need to replace refrigerators after 10 years.