

7. Cost Analysis

7.1 Introduction

This chapter presents estimates of the total national and household costs of the proposed Revised Total Coliform Rule (RTCR). To estimate the national costs of the proposed RTCR, the United States Environmental Protection Agency (EPA or Agency) calculated the net change in costs of rule components that expand current state¹ practices and the additional cost of new activities required under the proposed revised rule. The remainder of this chapter provides detailed discussion of the methodology used and results from the cost analyses and is organized as follows:

- **Section 7.2** describes the general costing and compliance assumptions used to estimate national costs of the proposed RTCR.
- **Section 7.3** describes the methodology of projecting costs over a 25-year period (discounted 3 and 7 percent, respectively) according to the proposed RTCR compliance schedule, estimating the present value of each cost, and annualizing each over a 25-year period.
- **Section 7.4** describes the methodology for developing costs for all rule activities.
- **Section 7.5** presents household cost estimates.
- **Section 7.6** presents a discussion of nonquantified costs.
- **Section 7.7** presents a discussion of uncertainties in cost estimates.
- **Section 7.8** presents a comparison of cost estimates for the proposed RTCR to estimates for other rule alternatives considered.

7.2 General Cost Assumptions and Methodology

The proposed RTCR Cost Model builds on the baseline data, occurrence analysis, and risk model results described in Chapters 4 – 6. Based on these analyses, the annual and cumulative numbers of public water systems (PWSs) that would be required to comply with each rule component of the proposed RTCR over the 25-year compliance period are provided in Appendix A. In general, the numbers of PWSs presented in Appendix A are multiplied by the unit cost assumptions described in this chapter to calculate total annual costs.

There are also several general costing assumptions that are unique to the costing process and are used as inputs to the cost model. The derivation of these inputs is discussed in detail below.

¹ The term “state” in the context of this chapter refers to any state or other primacy agency that has oversight authority for drinking water programs.

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2 **7.2.1 Labor Rates**
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4 For costing purposes, EPA estimates the labor needs and hourly labor rates of PWSs and
5 states. EPA recognizes that there may be significant variation in labor rates across all PWSs.
6 However, for purposes of this EA, and to implement national policy, EPA uses national-level
7 estimates from *Labor Costs for National Drinking Water Rules* (USEPA, 2003a) (as used in the
8 *Ground Water Rule Economic Analysis* (USEPA, 2006a)). For the proposed RTCR cost
9 analyses, these labor rates were inflated to 2007\$ using the Employee Cost Index (ECI), and
10 weighted based on the PWS size categories used in the proposed RTCR EA. To account for the
11 general composition of staff at PWSs of smaller sizes (e.g., PWSs serving 3,300 or fewer), EPA
12 uses only the technical rate. For PWSs serving more than 3,300 people, EPA uses a ratio of 80
13 percent technical labor to 20 percent managerial labor to arrive at a labor cost, or weighted labor
14 rate. The actual ratio between technical and managerial rates employed may vary by PWS and
15 among the different compliance activities under the proposed RTCR. However, for simplicity,
16 the 80/20 ratio is used as a general assumption for costing purposes in this EA. A full description
17 of the derivation of the labor rates used is provided in the *Technology and Cost Document for the*
18 *Revised Total Coliform Rule* (USEPA, 2009a). The weighted labor rates (\$2007) are shown in
19 Exhibit 7.1.
20

21 **Exhibit 7.1 Labor Rates by PWS Size (2007\$)**
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| PWS Size (population served) | Weighted Labor Rate (\$/hour) |
|------------------------------|-------------------------------|
| ≤ 500 | \$ 25.75 |
| 501 - 1,000 | \$ 28.96 |
| 1,001 - 4,100 | \$ 29.73 |
| 4,101 - 33,000 | \$ 36.00 |
| 33,001 - 96,000 | \$ 36.39 |
| 96,001 - 500,000 | \$ 41.01 |
| 500,001-1 Million | \$ 41.01 |
| > 1 Million | \$ 41.01 |

Note: Labor rates for each size category are assumed to be the same regardless of system type (CWS, NTNCWS, and TNCWS).

Source: Proposed RTCR T&C Document

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25 For states, the administrative and field engineer labor rates from the *2001 State Drinking*
26 *Water Needs Analysis* (ASDWA, 2001) are used in the proposed RTCR EA (as used in the GWR
27 EA (USEPA, 2006a)). These rates include a 60 percent overhead rate and were inflated to 2007\$
28 using the ECI. EPA recognizes that there may be significant variation in labor rates across all
29 states. The state labor rates in 2007\$ are \$39.22 for an administrative state employee and \$43.58
30 for a state field engineer. EPA assumes that the state field engineer would conduct site
31 inspections, and the administrative state employee would work with PWSs on all remaining
32 aspects of the proposed RTCR. Because this separation between field engineer and
33 administrative employee is used, the 80/20 weighting ratio between technical and managerial
34 rates is not used to develop state costs.
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36 **7.2.2 TCR Monitoring Costs per Sample**
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38 A laboratory fee, or cost per sample, is associated with distribution system monitoring.
39 For the purpose of this cost analysis, PWSs would perform total coliform (TC) monitoring,

1 supplemented by *E.coli* analyses as required. EPA estimated the sample analysis cost for both in-
 2 house and commercial laboratory analysis. The weighted unit costs for monitoring provided in
 3 Exhibit 7.2 are based on the percentage of PWSs conducting in-house and commercial laboratory
 4 analysis based on conversations of the TCRDSAC TWG. For in-house sample analysis, the
 5 estimated burden includes sample collection and analysis and also accounts for O&M costs such
 6 as equipment and maintenance. For commercial laboratory analysis, the estimated burden
 7 includes sample collection, shipping and delivery, and the laboratory analysis fee. These
 8 estimates reflect a national average; however, individual PWSs may realize collection burden
 9 that is either less than or greater than this average depending on the locations of sampling points
 10 in a particular PWS.

11
 12 Rates may vary due to regional variations in laboratory fees, the number of samples
 13 processed (quantity discounts), and laboratory capacity. As shown in Exhibit 7.2, the cost per
 14 sample decreases as more samples are taken, and as PWSs take advantage of savings from bulk
 15 shipping. A full description of the derivation of the monitoring costs per sample is provided in
 16 the *Technology and Cost Document for the Revised Total Coliform Rule* (USEPA, 2009a).

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 18
 19 **Exhibit 7.2 Monitoring Costs per Sample (2007\$)**
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| PWS Size (population served) | Numbers of Samples Taken and Delivered at the Same Time | | | | |
|---------------------------------|---|----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | ≥ 5 |
| < 500 | \$ 50.88 | \$ 42.97 | \$ 40.34 | \$ 39.02 | \$ 38.23 |
| 501 - 1,000 | \$ 59.81 | \$ 51.86 | \$ 49.21 | \$ 47.88 | \$ 47.09 |
| 1,001 - 4,100 | \$ 60.40 | \$ 52.45 | \$ 49.79 | \$ 48.47 | \$ 47.67 |
| 4,101 - 33,000 | \$ 65.26 | \$ 57.23 | \$ 54.55 | \$ 53.21 | \$ 52.40 |
| 33,001 - 96,000 | \$ 60.57 | \$ 56.55 | \$ 55.21 | \$ 54.54 | \$ 54.14 |
| 96,001 - 500,000 | \$ 72.38 | \$ 71.57 | \$ 71.30 | \$ 71.17 | \$ 71.09 |
| 500,001-1 Million | \$ 72.38 | \$ 71.57 | \$ 71.30 | \$ 71.17 | \$ 71.09 |
| > 1 Million | \$ 72.38 | \$ 71.57 | \$ 71.30 | \$ 71.17 | \$ 71.09 |

Note: Per sample monitoring costs for each size category are assumed to be the same regardless of system type (CWS, NTNCWS, and TNCWS).

Source: Proposed RTCR T&C Document

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 23 **7.2.3 Technology Unit Costs and Compliance Forecasts**
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25 EPA has assumed that PWSs may use a variety of existing best management practices
 26 (BMPs) and technologies to address distribution system deficiencies discovered during Level 1
 27 and Level 2 assessments. These BMPs and technologies include a combination of flushing
 28 programs, training of personnel to collect samples, replacing valves/pipes/hydrants/meters,
 29 installing new water mains, modifying operation of storage facilities, booster disinfection,
 30 physical security devices, etc. For a full list of technologies and BMPs that are anticipated to be
 31 used to meet rule requirements, see Appendix D. EPA estimated unit costs for these various
 32 components using equipment price lists and quotes, costs associated with BMPs from PWSs,
 33 engineering cost data sources (e.g., R.S. Means), consultations with the technical workgroup
 34 supporting the TCRDSAC Federal Advisory Committee (FAC), and other relevant assumptions
 35 used in economic analyses performed for existing drinking water rules (e.g., GWR). Detailed
 36 explanations of the unit cost derivations for these BMPs and technologies are presented in the
 37 *Technology and Cost Document for the Revised Total Coliform Rule* (USEPA, 2009a).
 38

1 Compliance forecasts (or technology selection forecasts) are estimates of which
2 technologies PWSs undergoing corrective action would use. Section 7.4.6 provides details on
3 compliance forecasts for PWSs performing corrective actions based on Level 1 and Level 2
4 assessments.

6 **7.2.4 Cost Model**

8 National costs are estimated using a cost model specifically developed for the proposed
9 RTCR. The model builds on the occurrence model described in Chapter 5. Within the modeling
10 structure, costs for PWSs serving >4,100 retail customers are analyzed differently from smaller
11 PWSs to capture differing baseline structures and to account for differences in available
12 occurrence data as described in Chapter 4.

14 PWS costs are estimated for different PWS types and size categories (eight size
15 categories are used based on population served, consistent with the *Technology and Cost*
16 *Document for the Revised Total Coliform Rule* (USEPA, 2009a)). PWS cost analyses include
17 estimates to implement the rule; to revise sampling plans; to conduct routine monitoring,
18 additional routine monitoring, and repeat monitoring; to perform Level 1 and Level 2
19 assessments and implement corrective actions; and to provide public notification. State cost
20 analyses include estimates of the labor burdens that states would face, including staff training on
21 proposed RTCR requirements and conducting annual administration, reviewing monitoring
22 reports, reviewing and approving corrective action plans, and recordkeeping. Section 7.4
23 provides detailed discussion on the underlying cost-buildup for each rule component analyzed
24 within the cost model.

26 **7.2.5 Modeled Variability and Uncertainty in National Costs**

28 As noted throughout this EA, there is variability among many of the input parameters to
29 the proposed RTCR cost model and several rule compliance assumptions based on PWS size and
30 type (e.g., population served, labor rates, TC hit rates, and occurrence distributions are different
31 for different sizes and types of PWSs). However, there is insufficient information to fully
32 characterize the distribution of variability (i.e., calculating confidence bounds) within each of
33 these PWS size and type classifications on a national scale; therefore, EPA uses mean values for
34 these input parameters.

36 EPA also recognizes that there is uncertainty in the national cost estimates. Many of the
37 uncertainties have the same impact on both the TCR and proposed RTCR options (e.g., baseline
38 assumptions and effects of GWR implementation). Because the EA analyses focus on net
39 changes between the TCR and the proposed RTCR options, these common sources of uncertainty
40 cancel each other out in the net change analyses. For assumptions that are major drivers of the
41 analyses and differ between the TCR and proposed RTCR options (e.g., corrective action
42 compliance forecast), EPA has evaluated uncertainty and performed sensitivity analyses to
43 qualitatively and quantitatively characterize the potential impacts of alternative input parameters.
44 Chapter 5 discusses uncertainty and presents sensitivity analyses pertaining to the predictive
45 occurrence model results (which also impact the cost calculations). Section 7.7 discusses
46 uncertainty and provides sensitivity analysis results as they specifically pertain to the cost
47 analyses.

7.3 Projecting and Discounting National Costs

Costs must be expressed in common units so they can be added together to calculate total annual costs and compared to benefits to compute net benefits. For the proposed RTCR, the performance of activities varies over time in response to regulatory requirements and monitoring results. To compare the values of performing these activities the year or years in which all costs are expended must be determined and the costs must be calculated as a net present value. For the purposes of this EA, one-time and yearly costs were projected over a 25-year time period to allow comparison with other drinking water regulations using the same analysis period. The net present values of costs are calculated using discount rates of 3 and 7 percent based on EPA policy and guidance from the Office of Information and Regulatory Affairs of the Office of Management and Budget (OMB).² A summary of the steps used in making adjustments to the national-level costs presented in this EA is as follows:

- Estimate all costs (noncorrective action, corrective action, and state) over a 25-year time horizon based on the rule implementation schedule.
- Calculate total net present value costs using 3 and 7 percent discount rates.
- Annualize the costs over 25 years using the same discount rates.

Appendix C presents step by step results for the projection and discounting of costs to show how yearly costs for each rule component are accounted for by the cost model for CWSs, NTNCWSs, TNCWSs, and states. Exhibits C.1 through C.9 show the nominal costs projected over the rule schedule and the present value of each cost calculated to the expected year of rule implementation for the TCR. Exhibits C.10 through C.45 show the results for the AIP and the Alternative Analysis.

7.4 Derivation of Costs for PWSs and States

This section presents the methodology and unit costs used to derive national costs for PWSs and states to perform TCR- and proposed RTCR-related activities. Chapter 3 contains detailed summaries of the activities under TCR and the proposed RTCR options (AIP and Alternative Analysis) considered as part of this EA. The following subsections provide a brief summary of each activity and the assumptions used to estimate the burden and costs attributable to both PWSs and states for:

- 7.4.1 Rule Implementation and Annual Administration
- 7.4.2 Revising Sampling Plans
- 7.4.3 Monitoring
- 7.4.4 Site Inspections
- 7.4.5 Assessments
- 7.4.6 Corrective Actions
- 7.4.7 Public Notification

² The choice of an appropriate discount rate is a complex and controversial issue among economists and policy makers. Therefore, the Agency compares streams of future national level costs and benefits using two alternative discount rates, 3 and 7 percent. The underlying logic for each discount rate can be found in *Guidelines for Preparing Economic Analyses* (USEPA, 2000x).

1
2 This chapter uses information from the baseline analysis in Chapter 4 as a starting point
3 for analysis of PWSs subject to each rule requirement. Additional baseline information and
4 detailed intermediate model outputs are provided in Appendix A.

5
6 There are also 57 states and primacy agencies that would incur costs as a result of the
7 proposed rule.

8 9 **7.4.1 Rule Implementation and Annual Administration**

10 11 *PWSs*

12
13 Under the AIP and Alternative Analysis, all PWSs subject to the proposed RTCR
14 would incur one-time costs that include time for staff to read the rule and become familiar with
15 its provisions and to train employees on rule requirements. No additional implementation burden
16 or costs are incurred by PWSs under the TCR to implement the proposed RTCR, as these PWSs
17 have already performed implementation and are continuing to perform annual administration
18 activities under the TCR. Under the AIP and Alternative Analysis, all PWSs subject to the
19 proposed RTCR would perform additional or transitional implementation activities. The labor
20 rates presented in Section 7.2.1 are used along with estimates of labor hours to generate
21 estimated implementation costs for all PWSs. Based on previous experience with rule
22 implementation and consistent with estimates used in the GWR EA, EPA estimates that PWSs
23 would require a total of 1.5 hours to read and understand the rule, and a total of 1 - 2 hours to
24 plan and mobilize (i.e., assign appropriate personnel and resources to carry out rule activities).
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Exhibit 7.3 Net Change in PWS Unit Burden and Cost Estimates for Rule Implementation (2007\$)

| PWS Size (Population Served) | Labor Cost (per hour) | Read and Understand Rule (hours/system) | Planning and Mobilization (hours/system) | Unit Cost |
|--|-----------------------|--|---|-----------|
| | A | B | C | D=A*(B+C) |
| Community Water Systems (CWSs) | | | | |
| ≤500 | \$ 25.75 | 1.5 | 1.5 | \$ 77.25 |
| 501-1,000 | \$ 28.96 | 1.5 | 1.5 | \$ 86.88 |
| 1,001-4,100 | \$ 29.73 | 1.5 | 1.5 | \$ 89.19 |
| 4,101-33,000 | \$ 36.00 | 1.5 | 2.0 | \$ 126.00 |
| 33,001-96,000 | \$ 36.39 | 1.5 | 2.0 | \$ 127.37 |
| 96,001-500,000 | \$ 41.01 | 1.5 | 2.0 | \$ 143.54 |
| 500,001-1 Million | \$ 41.01 | 1.5 | 2.0 | \$ 143.54 |
| > 1 Million | \$ 41.01 | 1.5 | 2.0 | \$ 143.54 |
| Nontransient Noncommunity Water Systems (NTNCWSs) | | | | |
| ≤500 | \$ 25.75 | 1.5 | 1.0 | \$ 64.38 |
| 501-1,000 | \$ 28.96 | 1.5 | 1.0 | \$ 72.40 |
| 1,001-4,100 | \$ 29.73 | 1.5 | 1.0 | \$ 74.33 |
| 4,101-33,000 | \$ 36.00 | 1.5 | 1.0 | \$ 90.00 |
| 33,001-96,000 | \$ 36.39 | 1.5 | 1.0 | \$ 90.98 |
| 96,001-500,000 | \$ 41.01 | 1.5 | 1.0 | \$ 102.53 |
| 500,001-1 Million | \$ 41.01 | 1.5 | 1.0 | \$ 102.53 |
| > 1 Million | \$ 41.01 | 1.5 | 1.0 | \$ 102.53 |
| Transient Noncommunity Water Systems (TNCWSs) | | | | |
| ≤500 | \$ 25.75 | 1.5 | 1.0 | \$ 64.38 |
| 501-1,000 | \$ 28.96 | 1.5 | 1.0 | \$ 72.40 |
| 1,001-4,100 | \$ 29.73 | 1.5 | 1.0 | \$ 74.33 |
| 4,101-33,000 | \$ 36.00 | 1.5 | 1.0 | \$ 90.00 |
| 33,001-96,000 | \$ 36.39 | 1.5 | 1.0 | \$ 90.98 |
| 96,001-500,000 | \$ 41.01 | 1.5 | 1.0 | \$ 102.53 |
| 500,001-1 Million | \$ 41.01 | 1.5 | 1.0 | \$ 102.53 |
| > 1 Million | \$ 41.01 | 1.5 | 1.0 | \$ 102.53 |

Notes:

PWS burden and cost estimates for implementation activities are assumed to be identical under the AIP and Alternative Analysis.

Sources:

(A) Labor rates for PWSs from Exhibit 7.1.

(B), (C) Labor hours for start-up activities are based on GWR estimates. Because RTCR is a revision of the existing TCR, one half of the system unit start up burden from GWR is used in the proposed RTCR.

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States

States would incur administrative costs to implement the proposed RTCR. These implementation costs are not directly required by specific provisions of proposed RTCR alternatives, but are necessary for states to ensure the provisions of the proposed RTCR are properly carried out. States would need to allocate time for their staff to establish and maintain the programs necessary to comply with the proposed RTCR, including developing and adopting state regulations and modifying data management systems to track new required PWS reports to the states. Time requirements for a variety of state agency activities and responses are estimated

1 in this EA. Exhibit 7.4 lists the activities required to revise the program following promulgation
 2 of the proposed RTCR along with their respective costs and burden. Because time requirements
 3 for implementation and annual administration activities vary among state agencies, EPA
 4 recognizes that the burden and cost estimates presented in Exhibit 7.4 may be an over- or under-
 5 estimate for some states.

6
 7
 8 **Exhibit 7.4 Net Change in State Unit Burden and Cost Estimates for Rule**
 9 **Implementation (2007\$)**
 10

| Compliance Activity | Labor Cost (per hour) | Hours | FTEs | Cost |
|---|--------------------------|--------|-----------|--------------|
| | A | B | C=B/2,080 | D=A*B |
| Read and Understand Rule | \$ 39.22 | 15 | 0.01 | \$ 588 |
| Regulation Adoption and Program Development | \$ 39.22 | 260 | 0.13 | \$ 10,197 |
| Initial Laboratory Certification | \$ 39.22 | - | - | \$ - |
| Modify Data Management Systems | \$ 39.22 | 520 | 0.25 | \$ 20,393 |
| PWS Training and Technical Assistance | \$ 39.22 | 520 | 0.25 | \$ 20,393 |
| Staff Training | \$ 39.22 | 130 | 0.06 | \$ 5,098 |
| Per State Total | | 1,445 | | \$ 56,670 |
| National Totals (57 States/Primacy Agencies) | | 82,365 | | \$ 3,230,201 |

Notes: Detail may not add due to independent rounding.

State burden and cost estimates for Implementation activities are assumed to be identical under the AIP and Alternative Analysis.

Sources: (A) Labor rate for state employee from Section 7.2.1.

(B) Labor hours for start-up activities are based on GWR estimates. Because the proposed RTCR is a revision of the existing TCR, one fourth of the State unit start up burden from GWR is used in the proposed RTCR.

(C) Full-time equivalent (FTE) assumes individual working 40 hours per week, 52 weeks per year.

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 13
 14 In addition to these one-time costs, states would use resources to continue
 15 administrative activities. On an annual basis, states must coordinate with their particular EPA
 16 Region to be certain that the state's program is consistent with federal requirements. States
 17 would also continue to train state and PWS staffs, maintain laboratories' certifications, and
 18 report PWS compliance information to the Safe Drinking Water Information System (SDWIS).
 19 However, based on discussions with stakeholders, once the initial implementation activities are
 20 complete, the annual burden (on average) for general administrative tasks for the proposed
 21 RTCR would not be expected to be any higher than the burden incurred under the current TCR
 22 requirements. In some cases, the general administrative burden for TCR may actually decrease
 23 as PWSs experience better performance, and thus require less state interaction, under the
 24 proposed RTCR. Therefore, no continuing annual administrative costs are estimated for the EA.
 25

26 States would also spend time responding to specific requirements under the proposed
 27 RTCR (i.e., review assessment reports, consult with PWSs, etc.). In these cases, the state costs
 28 are estimated under the costing for that particular rule requirement.
 29

30 *Implementation Net Cost Summary*
 31

32 Because EPA does not anticipate early implementation of the proposed RTCR, EPA
 33 expects that implementation activities would take place in years 1 through 3 of the 25-year
 34 compliance period before PWSs begin monitoring activities. Annualized costs estimates for

PWSs and states to perform implementation activities are estimated by multiplying the number of PWSs or states required to comply with the proposed RTCR (i.e., all PWSs) by the unit costs presented in Exhibits 7.3 and 7.4. Annualized and net change cost estimates for PWSs and states to perform implementation activities under the TCR, AIP, and Alternative Analysis are presented in Exhibit 7.5.

Exhibit 7.5 Annualized Cost Estimates for Rule Implementation (\$Millions, 2007\$)

| | PWSs | State | Total | PWSs | State | Total |
|--|------------------|---------|---------|------------------|---------|---------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |
| AIP - Net Change | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |
| Alternative Analysis - Total | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |
| Alternative Analysis - Net Change | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |

Notes:

1) Detail may not add due to independent rounding.

2) PWS and state burden and cost estimates for implementation activities are assumed to be identical under the AIP and Alternative Analysis.

Source: Proposed RTCR Cost Model.

7.4.2 Revising Sampling Plans

PWSs

Under the AIP and Alternative Analysis, all PWSs subject to the proposed RTCR would incur one-time costs to revise existing sampling plans to identify sampling locations and collection schedules that are representative of water throughout the distribution system. Under the TCR, no additional burden or costs are expected to be incurred by PWSs to revise sampling plans, as these PWSs are already collecting total coliform samples in accordance with a written sampling plan. The labor rates presented in Section 7.2.1 are used along with estimates of labor hours to generate sampling plan costs for all PWSs. Based on previous experience, EPA estimates that PWSs would require 2-8 hours for revising their sampling plan, depending on PWS size. Estimates of PWS unit costs to revise sampling plans are presented in Exhibit 7.6.

States

Under the AIP and Alternative Analysis, states are expected to incur one-time costs to review sampling plans and recommend any revisions to PWSs. Under the TCR, no additional burden or costs are incurred by states to review sampling plans, as these PWSs' sampling plans have already been reviewed and approved. State costs are based on the number of PWSs submitting revised sampling plans to PWSs each year. The state labor rate presented in Section 7.2.1, the number of PWSs in each PWS size category required to revise sampling plans, and estimates of labor hours are used to generate state sampling plan costs. Based on previous experience, EPA estimates that states would require 1-4 hours to review revised sampling plans and provide any necessary revisions to PWSs, depending on PWS size. Estimates of state unit costs to revise sampling plans are presented in Exhibit 7.6.

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Exhibit 7.6 Net Change in PWS and State Burden and Cost Estimates for Revising Sampling Plans (2007\$)

| PWS Size (Population Served) | PWSs | | | States | | |
|--|------------------------------|--|-----------|--------------------------------|---|-----------|
| | PWS Labor Cost (per hour) | Revise Sampling Plan (hours/system) | Unit Cost | State Labor Cost (per hour) | Review and Revise Sampling Plan (hours/system) | Unit Cost |
| | A | B | C=A*B | D | E | F=D*E |
| Community Water Systems (CWSs) | | | | | | |
| ≤500 | \$ 25.75 | 2.0 | \$ 51.50 | \$ 39.22 | 1.0 | \$ 39.22 |
| 501-1,000 | \$ 28.96 | 4.0 | \$ 115.84 | \$ 39.22 | 2.0 | \$ 78.44 |
| 1,001-4,100 | \$ 29.73 | 4.0 | \$ 118.92 | \$ 39.22 | 2.0 | \$ 78.44 |
| 4,101-33,000 | \$ 36.00 | 6.0 | \$ 216.00 | \$ 39.22 | 3.0 | \$ 117.65 |
| 33,001-96,000 | \$ 36.39 | 8.0 | \$ 291.12 | \$ 39.22 | 4.0 | \$ 156.87 |
| 96,001-500,000 | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| 500,001-1 Million | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| > 1 Million | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| Nontransient Noncommunity Water Systems (NTNCWSs) | | | | | | |
| ≤500 | \$ 25.75 | 2.0 | \$ 51.50 | \$ 39.22 | 1.0 | \$ 39.22 |
| 501-1,000 | \$ 28.96 | 4.0 | \$ 115.84 | \$ 39.22 | 2.0 | \$ 78.44 |
| 1,001-4,100 | \$ 29.73 | 4.0 | \$ 118.92 | \$ 39.22 | 2.0 | \$ 78.44 |
| 4,101-33,000 | \$ 36.00 | 6.0 | \$ 216.00 | \$ 39.22 | 3.0 | \$ 117.65 |
| 33,001-96,000 | \$ 36.39 | 8.0 | \$ 291.12 | \$ 39.22 | 4.0 | \$ 156.87 |
| 96,001-500,000 | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| 500,001-1 Million | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| > 1 Million | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| Transient Noncommunity Water Systems (TNCWSs) | | | | | | |
| ≤500 | \$ 25.75 | 2.0 | \$ 51.50 | \$ 39.22 | 1.0 | \$ 39.22 |
| 501-1,000 | \$ 28.96 | 4.0 | \$ 115.84 | \$ 39.22 | 2.0 | \$ 78.44 |
| 1,001-4,100 | \$ 29.73 | 4.0 | \$ 118.92 | \$ 39.22 | 2.0 | \$ 78.44 |
| 4,101-33,000 | \$ 36.00 | 6.0 | \$ 216.00 | \$ 39.22 | 3.0 | \$ 117.65 |
| 33,001-96,000 | \$ 36.39 | 8.0 | \$ 291.12 | \$ 39.22 | 4.0 | \$ 156.87 |
| 96,001-500,000 | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| 500,001-1 Million | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |
| > 1 Million | \$ 41.01 | 8.0 | \$ 328.08 | \$ 39.22 | 4.0 | \$ 156.87 |

Notes:

PWS and state burden and cost estimates for reviewing and revising sampling plans are assumed to be identical under the AIP and Alternative Analysis.

Sources:

- (A) Labor rates for systems from Exhibit 7.1.
- (B) PWS labor hours for reviewing and revising sampling plan reflect EPA estimate.
- (D) Labor rates for state employee from Section 7.2.1.
- (E) State labor hours for reviewing and revising sampling plan reflect EPA estimate.

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1 *Sampling Plan Net Cost Summary*

2
 3 PWSs are expected to revise sampling plans before monitoring begins. For modeling
 4 purposes costs are split between years 2 and 3 of the 25-year compliance period (monitoring is
 5 required starting in year 4). Annualized cost estimates for PWSs to revise sampling plans and
 6 states to review the revised sampling plans (and consult with PWSs if necessary) under the TCR,
 7 AIP, and Alternative Analysis are presented in Exhibit 7.7.

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 9
 10 **Exhibit 7.7 Annualized Cost Estimates to Revise (PWSs) and Review (States)**
 11 **Sampling Plans (\$Millions, 2007\$)**

| | PWSs | State | Total | PWSs | State | Total |
|--|------------------|---------|---------|------------------|---------|---------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |
| AIP - Net Change | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |
| Alternative Analysis - Total | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |
| Alternative Analysis - Net Change | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |

Note: Detail may not add due to independent rounding.

Source: Proposed RTCR Cost Model.

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 14
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 16 **7.4.3 Monitoring**

17 *PWSs*

18
 19
 20 Monitoring costs for PWSs are calculated by multiplying the total numbers of routine,
 21 additional routine, and repeat samples required under the TCR, AIP, and Alternative Analysis
 22 (Exhibit 7.8) by the monitoring costs per sample presented in Exhibit 7.2. Differences in
 23 monitoring requirements between the TCR and the AIP and Alternative Analysis as summarized
 24 in Exhibit 7.8 below drive the differences in monitoring costs between the options. Chapters 4
 25 (Exhibit 4.4) and 5 (Exhibit 5.14) show the distribution of monitoring frequencies prior to and
 26 after rule implementation, respectively, that are used to further inform the analysis. The effects
 27 of the differences in monitoring regimes on net changes in costs are described in further detail
 28 following the exhibit.

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Exhibit 7.8 Summary of Monitoring Requirements Under the TCR, AIP, and Alternative Analysis

| Monitoring Requirement | Current TCR | AIP | Alternative Analysis |
|---|--|--|--|
| Default Routine Monitoring Frequency | <p>The default TC monitoring frequency for ground water NCWSs serving $\leq 1,000$ people is quarterly</p> <p>The default TC monitoring frequency for all other PWSs is monthly for TC</p> | <p>The default TC monitoring frequency for non-seasonal ground water NCWSs serving $\leq 1,000$ people is quarterly</p> <p>The default TC monitoring frequency for all other PWSs is monthly</p> <p>PWSs would be permitted to transition to the proposed RTCR at their current TC monitoring frequencies³</p> | <p>The default TC monitoring frequency for all PWSs is monthly</p> <p>All PWSs would start on monthly TC monitoring</p> |
| Reduced/Increased Routine Monitoring Frequency | <p>Ground water NCWSs serving $\leq 1,000$ people can reduce to annual monitoring if no sanitary defects and served only by protected GW sources</p> <p>Ground water CWSs serving $\leq 1,000$ can reduce to quarterly monitoring if no history of TC+ in current configuration, no sanitary defects, and served only by protected GW sources</p> <p>All other PWSs are ineligible for reduced monitoring</p> <p>PWSs not meeting criteria for reduced monitoring return to default monitoring (no increased monitoring provision under current TCR)</p> | <p>Ground water NCWSs serving $\leq 1,000$ people can reduce to annual monitoring if no sanitary defects, clean TCR compliance history, and annual site visit or Level 2 assessment, and correction of all identified sanitary defects</p> <p>Ground water CWSs serving $\leq 1,000$ people can reduce to quarterly monitoring if no sanitary defects, clean TCR compliance history, and at least one of the following:</p> <ol style="list-style-type: none"> 1) Annual site visit or Level 2 assessment and correction of all identified sanitary defects; 2) An approved cross connection control program; 3) Continuous disinfection & a residual; 4) 4-log inactivation of viruses daily as per GWR (4 hr exception allowed); or 5) Other equivalent measures as approved by the primacy agency. | <p>Ground water NCWSs serving $\leq 1,000$ people can reduce to quarterly monitoring if no sanitary defects, clean TCR compliance history, and annual site visit or Level 2 assessment, and correction of all identified sanitary defects.</p> <p>Ground water CWSs serving $\leq 1,000$ people can reduce to quarterly monitoring if no sanitary defects, clean TCR compliance history, and at least one of the following:</p> <ol style="list-style-type: none"> 1) Annual site visit or Level 2 assessment and correction of all identified sanitary defects; 2) An approved cross connection control program; 3) Continuous disinfection & a residual; 4) 4-log inactivation of viruses daily as per GWR (4 hr exception allowed); or 5) Other equivalent measures as approved by |

³ In order for PWSs to be able to transition to the proposed RTCR at their current TC monitoring frequencies, an annual site visit or voluntary Level 2 assessment would be needed in the first year for PWSs on annual monitoring, including those transitioning.

| Monitoring Requirement | Current TCR | AIP | Alternative Analysis |
|---|--|---|--|
| | | <p>All other PWSs are ineligible for reduced monitoring</p> <p>Ground water PWSs serving ≤1,000 people on quarterly or annual monitoring that experience any of the following events will be required to begin monthly monitoring (i.e., return to default monitoring frequency):</p> <ol style="list-style-type: none"> 1) System triggers a Level 2 assessment (or a 2nd Level 1 assessment in a rolling 12 month period); 2) System has an <i>E. coli</i> MCL violation; 3) System has an RTCR treatment technique violation (either Level 1 or 2); or 4) System has two routine monitoring violations in a rolling 12-month period. | <p>the primacy agency.</p> <p>All other PWSs are ineligible for reduced monitoring</p> <p>Ground water PWSs serving ≤1,000 people on quarterly monitoring that experience any of the following events will be required to begin monthly monitoring (i.e., return to default monitoring frequency):</p> <ol style="list-style-type: none"> 1) System triggers a Level 2 assessment (or a 2nd Level 1 assessment in a rolling 12 month period); 2) System has an <i>E. coli</i> MCL violation; 3) System has an RTCR treatment technique violation (either Level 1 or 2); or 4) System has two routine monitoring violations in a rolling 12-month period. |
| <p>Additional Routine Monitoring Frequency</p> | <p>All PWSs serving ≤4,100 people must take at least 5 samples in the month following a TC+ unless state performs site visit and deems additional sampling unnecessary OR determines the reason for the TC+ and PWS has or will correct problem.</p> <p>Not required for PWSs serving >4,100 people</p> | <p>Ground water NCWSs serving ≤1,000 people and monitoring quarterly or annually must take at least 3 samples in the month following TC+</p> <p>Ground water CWSs serving <1,000 people and monitoring quarterly must take at least 3 samples in the month following TC+</p> <p>Not required for PWSs monitoring monthly</p> | <p>Ground water PWSs (NCWS and CWS) serving ≤1,000 people and monitoring quarterly must take at least 3 samples in the month following TC+</p> <p>Not required for PWSs monitoring monthly</p> |
| <p>Repeat Monitoring Frequency</p> | <p>All PWSs serving ≤1,000 people must take 4 repeat TC samples</p> <p>All PWSs serving >1,000 people must take 3 repeat TC samples</p> | <p>All PWSs must take 3 repeat TC samples</p> | <p>All PWSs must take 3 repeat TC samples</p> |

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1
2 Routine Monitoring
3

4 Under the AIP, the increased stringency to qualify for reduced monitoring results in more
5 routine samples being taken over time (fewer PWSs are on reduced monitoring). For the
6 Alternative Analysis, this effect would be combined with the requirement that all PWSs start the
7 implementation period on monthly monitoring. The alternative analysis also prohibits annual
8 monitoring for an even greater increase in the number of routine samples. The resulting
9 increases in costs due to increased monitoring are reflected in the routine monitoring costs shown
10 in Exhibit 7.10.

11
12 Additional Routine Monitoring⁴
13

14 The overall reductions in additional routine samples required under the AIP and
15 Alternative Analysis result in reduced costs (Exhibit 7.10). Cost reductions are greater under the
16 Alternative Analysis than under the AIP because all PWSs start on monthly monitoring and are
17 not required to take additional routine samples during that period.
18

19 Repeat Monitoring
20

21 Under the AIP and Alternative Analysis, all PWSs are only required to take three repeat
22 samples. However, EPA assumes that ground water PWSs treating to less than 4-log would still
23 take an additional source water sample to comply with the GWR (no change in cost).
24 Additionally, the number of repeat samples taken is a function of the number of regular and
25 additional routine samples taken, which in turn affects the number of TC+ samples found (i.e.,
26 the more samples taken, the greater chance of finding a TC+). Thus, the overall increase in
27 routine sampling under the AIP and Alternative Analysis would result in more repeat samples
28 while the decreases in additional routine samples under both of these options would lead to fewer
29 repeat samples. The overall effect is a reduction in the number (and cost) of required repeat
30 samples under the AIP and an increase under the Alternative Analysis compared to the current
31 TCR (Exhibit 7.10).
32

33 Cumulative Monitoring Summary
34

35 Exhibit 7.9 summarizes the total number of samples taken by PWS size and category for
36 routine, additional, and repeat monitoring under the TCR, AIP, and Alternative Analysis over the
37 entire 25 year period of analysis. Appendix A presents additional information on samples taken
38 for each individual year during the analysis period.
39

⁴ For modeling purposes and discussion throughout the cost chapter, regular routine monitoring samples taken in the month following a total coliform-positive are included in the additional routine monitoring sample counts.

Exhibit 7.9 Cumulative Number of Samples over 25-Year Period of Analysis

| PWS Size (Population Served) | TCR | | | AIP | | | Alternative Analysis | | |
|---|----------------------------------|--|---------------------------------|----------------------------------|--|---------------------------------|----------------------------------|--|---------------------------------|
| | Routine Monitoring Samples | Additional Routine Monitoring Samples | Repeat Monitoring Samples | Routine Monitoring Samples | Additional Routine Monitoring Samples | Repeat Monitoring Samples | Routine Monitoring Samples | Additional Routine Monitoring Samples | Repeat Monitoring Samples |
| | A | B | C | D | E | F | G | H | I |
| Community Water Systems (CWSs) - SW | | | | | | | | | |
| ≤500 | 866,312 | 50,325 | 40,498 | 876,336 | - | 28,208 | 876,336 | - | 28,208 |
| 501-1,000 | 306,733 | 14,501 | 11,641 | 309,610 | - | 8,366 | 309,610 | - | 8,366 |
| 1,001-4,100 | 1,920,789 | 55,202 | 33,730 | 1,950,717 | - | 32,222 | 1,950,717 | - | 32,222 |
| 4,101-33,000 | 10,636,296 | - | 186,781 | 10,636,296 | - | 175,689 | 10,636,296 | - | 175,689 |
| 33,001-96,000 | 11,058,960 | - | 194,204 | 11,058,960 | - | 182,671 | 11,058,960 | - | 182,671 |
| 96,001-500,000 | 10,190,400 | - | 178,951 | 10,190,400 | - | 168,324 | 10,190,400 | - | 168,324 |
| 500,001-1 Million | 2,019,600 | - | 35,466 | 2,019,600 | - | 33,360 | 2,019,600 | - | 33,360 |
| > 1 Million | 1,686,960 | - | 29,624 | 1,686,960 | - | 27,865 | 1,686,960 | - | 27,865 |
| Total | 38,686,051 | 120,028 | 710,896 | 38,728,879 | - | 656,704 | 38,728,879 | - | 656,704 |
| Community Water Systems (CWSs) - GW | | | | | | | | | |
| ≤500 | 6,190,070 | 534,861 | 369,071 | 6,291,124 | 14,885 | 278,988 | 6,362,722 | 12,850 | 282,064 |
| 501-1,000 | 1,072,053 | 70,367 | 51,248 | 1,085,105 | 1,840 | 37,894 | 1,097,866 | 1,585 | 38,313 |
| 1,001-4,100 | 3,998,892 | 153,962 | 95,908 | 4,078,046 | - | 86,033 | 4,078,046 | - | 86,033 |
| 4,101-33,000 | 9,145,224 | - | 219,336 | 9,145,224 | - | 192,934 | 9,145,224 | - | 192,934 |
| 33,001-96,000 | 4,884,000 | - | 117,136 | 4,884,000 | - | 103,036 | 4,884,000 | - | 103,036 |
| 96,001-500,000 | 1,945,680 | - | 46,665 | 1,945,680 | - | 41,047 | 1,945,680 | - | 41,047 |
| 500,001-1 Million | 253,440 | - | 6,078 | 253,440 | - | 5,347 | 253,440 | - | 5,347 |
| > 1 Million | 269,280 | - | 6,458 | 269,280 | - | 5,681 | 269,280 | - | 5,681 |
| Total | 27,758,639 | 759,191 | 911,900 | 27,951,899 | 16,725 | 750,961 | 28,036,258 | 14,436 | 754,456 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - SW | | | | | | | | | |
| ≤500 | 131,048 | 8,652 | 7,013 | 132,752 | - | 4,913 | 132,752 | - | 4,913 |
| 501-1,000 | 22,970 | 1,299 | 1,046 | 23,223 | - | 721 | 23,223 | - | 721 |
| 1,001-4,100 | 41,740 | 2,147 | 1,351 | 42,751 | - | 1,183 | 42,751 | - | 1,183 |
| 4,101-33,000 | 50,424 | - | 1,632 | 50,424 | - | 1,395 | 50,424 | - | 1,395 |
| 33,001-96,000 | 34,320 | - | 1,111 | 34,320 | - | 950 | 34,320 | - | 950 |
| 96,001-500,000 | 31,680 | - | 1,025 | 31,680 | - | 877 | 31,680 | - | 877 |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 312,182 | 12,097 | 13,179 | 315,151 | - | 10,038 | 315,151 | - | 10,038 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - GW | | | | | | | | | |
| ≤500 | 1,697,166 | 191,021 | 126,412 | 1,603,442 | 73,141 | 101,506 | 2,286,102 | 56,900 | 134,953 |
| 501-1,000 | 190,539 | 15,842 | 10,668 | 176,916 | 6,619 | 8,710 | 245,125 | 5,088 | 11,390 |
| 1,001-4,100 | 460,656 | 27,464 | 17,531 | 473,131 | - | 14,816 | 473,131 | - | 14,816 |
| 4,101-33,000 | 153,648 | - | 5,847 | 153,648 | - | 4,811 | 153,648 | - | 4,811 |
| 33,001-96,000 | 23,760 | - | 904 | 23,760 | - | 744 | 23,760 | - | 744 |
| 96,001-500,000 | - | - | - | - | - | - | - | - | - |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 2,525,769 | 234,327 | 161,363 | 2,430,897 | 79,759 | 130,587 | 3,181,767 | 61,988 | 166,714 |
| Transient Noncommunity Water Systems (TNCWSs) - SW | | | | | | | | | |
| ≤500 | 473,552 | 55,019 | 44,890 | 484,610 | - | 28,603 | 484,610 | - | 28,603 |
| 501-1,000 | 22,683 | 2,720 | 2,220 | 23,222 | - | 1,384 | 23,222 | - | 1,384 |
| 1,001-4,100 | 39,816 | 3,990 | 2,590 | 42,209 | - | 2,118 | 42,209 | - | 2,118 |
| 4,101-33,000 | 40,656 | - | - | 40,656 | - | 2,040 | 40,656 | - | 2,040 |
| 33,001-96,000 | - | - | - | - | - | - | - | - | - |
| 96,001-500,000 | - | - | - | - | - | - | - | - | - |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | 102,960 | - | - | 102,960 | - | 5,167 | 102,960 | - | 5,167 |
| Total | 679,667 | 61,730 | 49,700 | 693,657 | - | 39,312 | 693,657 | - | 39,312 |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | | | |
| ≤500 | 6,106,110 | 1,228,268 | 817,225 | 7,822,654 | 599,134 | 810,984 | 12,608,106 | 444,794 | 1,179,108 |
| 501-1,000 | 177,043 | 32,788 | 22,142 | 204,416 | 14,305 | 19,933 | 299,924 | 10,030 | 26,863 |
| 1,001-4,100 | 335,123 | 29,699 | 18,945 | 348,291 | - | 15,633 | 348,291 | - | 15,633 |
| 4,101-33,000 | 156,288 | - | 8,835 | 156,288 | - | 7,015 | 156,288 | - | 7,015 |
| 33,001-96,000 | 34,320 | - | 1,940 | 34,320 | - | 1,540 | 34,320 | - | 1,540 |
| 96,001-500,000 | 26,400 | - | 1,492 | 26,400 | - | 1,185 | 26,400 | - | 1,185 |
| 500,001-1 Million | 63,360 | - | 3,582 | 63,360 | - | 2,844 | 63,360 | - | 2,844 |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 6,898,643 | 1,290,756 | 874,162 | 8,655,729 | 613,440 | 859,133 | 13,536,689 | 454,825 | 1,234,188 |
| Grand Total | 76,860,951 | 2,478,128 | 2,721,199 | 78,776,211 | 709,924 | 2,446,734 | 84,492,400 | 531,249 | 2,861,412 |

Note: (B), (E), (H) For modeling purposes, additional routine sample counts include regular routine samples taking in the same month.

Source:

Appendix A - Total PWS Counts (A.1z, A.2z, A.3z)

1 *States*

2

3 Under the current TCR, states are estimated to incur a monthly 15-minute burden to
4 review each PWS's sample results. This estimate reflects the methodology used to calculate
5 reporting and recordkeeping burden under the current TCR in the *Draft Information Collection*
6 *Request for the Microbial Rules* (USEPA, 2008b). Because the existing methodology is
7 calculated on a per PWS basis and the total number PWSs is the same for cost modeling under
8 the TCR and both proposed RTCR options, the net change in costs for reviewing monitoring
9 results is estimated to be zero for the AIP and Alternative Analysis. Specific actions by states
10 related to positive samples are accounted for under the actions required in response to those
11 samples. Maintenance of sample results in SDWIS is accounted for under general
12 implementation and administrative activities, which are discussed in section 7.4.1.

13

14 *Monitoring Net Cost Summary*

15

16 The annualized net present value total and net change cost estimates for PWSs and states
17 to perform monitoring under the TCR, AIP, and Alternative Analysis and are presented in
18 Exhibit 7.10. All monitoring is modeled to begin in year 4 of the 25-year analysis period.

19

20 The overall estimated increase in monitoring costs seen under the AIP is driven by
21 increases in routine monitoring due to stricter requirements to qualify for reduced monitoring.
22 However, this is mostly offset by reductions in additional routine and repeat monitoring required
23 under the revised regulations. For the Alternative Analysis, the requirement for all PWSs to
24 sample on a monthly basis at the beginning of rule implementation results in a much large cost
25 differential that is only partially offset by reduced costs due to reductions in additional routine
26 monitoring requirements.

27

28

1 **Exhibit 7.10 Annualized PWS and State Cost Estimates for Monitoring Costs**
2 **(\$Millions, 2007\$)**
3

| | PWSs | State | Total | PWSs | State | Total |
|---------------------------------------|------------------|-------|-----------|------------------|-------|-----------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| Routine Monitoring | | | | | | |
| TCR - Total | \$ 170.60 | \$ - | \$ 170.60 | \$ 163.94 | \$ - | \$ 163.94 |
| AIP - Total | \$ 174.34 | \$ - | \$ 174.34 | \$ 167.43 | \$ - | \$ 167.43 |
| AIP - Net Change | \$ 3.75 | \$ - | \$ 3.75 | \$ 3.48 | \$ - | \$ 3.48 |
| AIP - Percent Change | 2.20% | 0.00% | 2.20% | 2.12% | 0.00% | 2.12% |
| Alternative Analysis - Total | \$ 187.61 | \$ - | \$ 187.61 | \$ 182.57 | \$ - | \$ 182.57 |
| Alternative Analysis - Net Change | \$ 17.01 | \$ - | \$ 17.01 | \$ 18.62 | \$ - | \$ 18.62 |
| Alternative Analysis - Percent Change | 9.97% | 0.00% | 9.97% | 11.36% | 0.00% | 11.36% |
| Additional Monitoring | | | | | | |
| TCR - Total | \$ 3.87 | \$ - | \$ 3.87 | \$ 3.72 | \$ - | \$ 3.72 |
| AIP - Total | \$ 1.14 | \$ - | \$ 1.14 | \$ 1.11 | \$ - | \$ 1.11 |
| AIP - Net Change | \$ (2.72) | \$ - | \$ (2.72) | \$ (2.61) | \$ - | \$ (2.61) |
| AIP - Percent Change | -70.48% | 0.00% | -70.48% | -70.18% | 0.00% | -70.18% |
| Alternative Analysis - Total | \$ 0.78 | \$ - | \$ 0.78 | \$ 0.66 | \$ - | \$ 0.66 |
| Alternative Analysis - Net Change | \$ (3.08) | \$ - | \$ (3.08) | \$ (3.05) | \$ - | \$ (3.05) |
| Alternative Analysis - Percent Change | -79.79% | 0.00% | -79.79% | -82.15% | 0.00% | -82.15% |
| Repeat Monitoring | | | | | | |
| TCR - Total | \$ 5.07 | \$ - | \$ 5.07 | \$ 4.87 | \$ - | \$ 4.87 |
| AIP - Total | \$ 4.65 | \$ - | \$ 4.65 | \$ 4.47 | \$ - | \$ 4.47 |
| AIP - Net Change | \$ (0.42) | \$ - | \$ (0.42) | \$ (0.40) | \$ - | \$ (0.40) |
| AIP - Percent Change | -8.34% | 0.00% | -8.34% | -8.26% | 0.00% | -8.26% |
| Alternative Analysis - Total | \$ 5.40 | \$ - | \$ 5.40 | \$ 5.33 | \$ - | \$ 5.33 |
| Alternative Analysis - Net Change | \$ 0.33 | \$ - | \$ 0.33 | \$ 0.46 | \$ - | \$ 0.46 |
| Alternative Analysis - Percent Change | 6.60% | 0.00% | 6.60% | 9.36% | 0.00% | 9.36% |
| Total | | | | | | |
| TCR - Total | \$ 179.53 | \$ - | \$ 179.53 | \$ 172.53 | \$ - | \$ 172.53 |
| AIP - Total | \$ 180.13 | \$ - | \$ 180.13 | \$ 173.01 | \$ - | \$ 173.01 |
| AIP - Net Change | \$ 0.60 | \$ - | \$ 0.60 | \$ 0.47 | \$ - | \$ 0.47 |
| AIP - Percent Change | 0.33% | 0.00% | 0.33% | 0.27% | 0.00% | 0.27% |
| Alternative Analysis - Total | \$ 193.79 | \$ - | \$ 193.79 | \$ 188.56 | \$ - | \$ 188.56 |
| Alternative Analysis - Net Change | \$ 14.26 | \$ - | \$ 14.26 | \$ 16.02 | \$ - | \$ 16.02 |
| Alternative Analysis - Percent Change | 7.94% | 0.00% | 7.94% | 9.29% | 0.00% | 9.29% |

Notes:

- 1) Detail may not add due to independent rounding.
- 2) For modeling purposes, additional routine sample counts include regular routine samples taking in the same month.
- 3) State costs are premised on a per system basis. State costs for monitoring are expected to be identical under the TCR, AIP, and Alternative Analysis, and are therefore not included in the total costs.

Source: Proposed RTCR Cost Model.

4 **7.4.4 Site Inspections**
5
6
7
8

9 Under the AIP, any PWS on an annual monitoring schedule would be required to also
10 have an annual site inspection conducted by the state or state-designated third party. A voluntary
11 Level 2 site assessment can also satisfy the site inspection requirement. In many cases a sanitary
12 survey performed during the same year can also be used to satisfy this requirement. Although
13 similar site inspections are not currently required under the existing TCR, discussions with states
14 during the TCRDSAC proceedings revealed that some do, in fact, conduct such inspections for
15 PWSs on annual monitoring schedules. Because of the high cost for an annual site inspection by
16 a state, for this analysis, EPA assumes that no states would choose to conduct annual site
17 inspections unless they already do so under the current TCR. Under the Alternative Analysis,
18 PWSs are required to sample no less than quarterly and under that requirement may elect to
19 forgo annual site inspections (especially in cases where the state performs or subsidizes the

1 additional monitoring for PWSs that were previously monitoring annually) since they would not
2 be required. However, due to a lack of data on the potential for discontinuing annual site visits
3 under the Alternative Analysis, the proposed RTCR Cost Model does not calculate the potential
4 cost reductions for discontinuing site inspections under the Alternative Analysis. This leads to a
5 potential overestimate of costs for the Alternative Analysis (i.e., a cost savings may be realized
6 for some states). For overall costing purposes, no net state or PWS costs are assumed for annual
7 monitoring site inspections under the AIP or Alternative Analysis.
8
9

10 **7.4.5 Assessments**

11 *PWSs*

12 Level 1 Assessments

13
14
15
16 Under the AIP and Alternative Analysis, all PWSs experiencing a Level 1 trigger must
17 complete a Level 1 assessment of the PWS. A Level 1 trigger under the AIP and Alternative
18 Analysis is defined as:

- 19
- 20 • For PWSs taking ≥ 40 samples per month, TC+ exceeds 5.0% for a given month;
- 21 • For PWSs taking < 40 samples per month, two or more TC+ in a month; or
- 22 • Failure to take all required repeat samples after a single TC+ sample.
- 23

24 The current TCR does not require a specific assessment to be performed in response to
25 events comparable to the Level 1 triggers described above (i.e., non-acute violations). However,
26 PWSs do perform some level of activity similar to a Level 1 assessment in response to
27 violations. This effort is taken into account in the cost model to accurately assess the net cost of
28 changes attributable to the proposed RTCR.
29

30 A Level 1 assessment (or comparable assessment under the current TCR) includes a
31 simple examination of the PWS and relevant operational practices. The Level 1 assessment
32 would be intended as a self-assessment (EPA anticipates that these would be completed by the
33 PWS and reviewed by the state). If the state determines the completed assessment form
34 insufficient, it would consult with the PWS. Additionally, as part of the Level 1 assessment,
35 PWSs would be required to submit a timetable to the state to identify sanitary defects detected,
36 corrective actions completed, and a timetable for any corrective actions not already completed.
37 Additional detail on the requirements of a Level 1 assessment and the derivation of associated
38 unit burden (labor hours) for performance of the assessment is provided in the *Technology and*
39 *Cost Document for the Revised Total Coliform Rule* (USEPA, 2009a).
40

41 Level 2 Assessments

42
43 Under the AIP and Alternative Analysis, all PWSs experiencing a Level 2 trigger must
44 complete a Level 2 assessment of the PWS. A Level 2 trigger under the AIP and Alternative
45 Analysis is defined as:

- 46
- 47 • An *E.coli* MCL violation;
- 48 • An *E.coli* monitoring violation; or

- 1 • A second Level 1 trigger, within a rolling 12 month period, unless the primary agency
2 has determined a likely reason that the initial Level 1 samples were total coliform-
3 positive and establishes that the PWS has corrected the problem.
- 4 • For PWSs with approved reduced annual monitoring, a Level 1 trigger in two
5 consecutive years.

6
7 As with Level 1 assessments, the current TCR does not require a specific assessment to
8 be performed in response to events comparable to the Level 2 triggers described above (i.e.,
9 acute violations), but PWSs do currently perform some level of activity similar to a Level 2
10 assessment in response to acute violations. These actions are taken into account in the cost
11 model to properly assess the net cost of changes attributable to the proposed RTCR regulatory
12 alternatives.

13
14 A Level 2 assessment (or comparable assessment under the current TCR) would be more
15 involved than a Level 1 assessment. A Level 2 assessment would be a more detailed
16 examination of the PWS, its monitoring program and results, and its operational practices. It
17 would comprise essentially the same elements as a Level 1 assessment, but each element would
18 be investigated in greater detail. The level of effort and resources required to implement the
19 Level 2 assessments would be commensurate with a more comprehensive investigation, a higher
20 level review of available information, and may involve the engagement of additional parties and
21 expertise. Additionally, as part of the Level 2 assessment, PWSs must submit a timetable to the
22 state for completion of any corrective actions that have not already been completed. Additional
23 detail on the derivation of associated unit burden (labor hours) for performance of the assessment
24 is provided in the *Technology and Cost Document for the Revised Total Coliform Rule* (USEPA,
25 2009a).

26
27 The labor rates presented in Section 7.2.1 are used along with estimates of labor hours as
28 presented in the *Technology and Cost Document for the Revised Total Coliform Rule* (USEPA,
29 2009a) to generate Level 1 and Level 2 assessment unit costs by PWS size and type. Labor
30 hours provided are assumed to include time for reporting and recordkeeping activities. Estimates
31 of PWS unit costs for Level 1 and Level 2 site assessments are presented in Exhibits 7.11 and
32 7.12.⁵ Additionally, the numbers of Level 1 and level 2 assessments over the 25-year
33 compliance period (used to calculate total costs) are presented in Exhibit 7.13.
34

⁵ In some instances, the performance of an assessment (especially a Level 2 assessment) may overlap with a scheduled sanitary survey. To the extent that the requirements for performing a sanitary survey may be satisfied as part of the assessment process, PWSs and states may realize a cost savings compared to performing a separate sanitary survey. This potential for indirect cost savings is not captured in the cost model, resulting in a potential overestimate of costs stemming from proposed RTCR implementation.

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Exhibit 7.11 Net Change in PWS Unit Cost Estimates for Level 1 and Level 2 Assessments (TCR) (2007\$)

| PWS Size (Population Served) | Labor Cost (per hour) | Level 1 Assessments | | Level 2 Assessments | | | |
|---|--------------------------|--|-------------|-----------------------------|-------------|---|-----------|
| | | Non-Acute Violations (single violation) (hours) | Unit Cost | Acute Violations (hours) | Unit Cost | Non-Acute Violations (multiple violations) (hours) | Unit Cost |
| | | | | | | | |
| A | B | C=A*B | D | E=A*D | F | G=A*F | |
| Community Water Systems (CWSs) - SW | | | | | | | |
| ≤500 | \$ 25.75 | 11.0 | \$ 283.27 | 14.0 | \$ 360.52 | \$ 360.52 | |
| 501-1,000 | \$ 28.96 | 13.0 | \$ 376.48 | 15.0 | \$ 434.40 | \$ 434.40 | |
| 1,001-4,100 | \$ 29.73 | 22.0 | \$ 654.06 | 29.0 | \$ 862.17 | \$ 862.17 | |
| 4,101-33,000 | \$ 36.00 | 30.0 | \$ 1,080.00 | 36.0 | \$ 1,296.00 | \$ 1,296.00 | |
| 33,001-96,000 | \$ 36.39 | 59.0 | \$ 2,147.01 | 75.0 | \$ 2,729.25 | \$ 2,729.25 | |
| 96,001-500,000 | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| 500,001-1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| > 1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| Community Water Systems (CWSs) - GW | | | | | | | |
| ≤500 | \$ 25.75 | 11.0 | \$ 283.27 | 14.0 | \$ 360.52 | \$ 360.52 | |
| 501-1,000 | \$ 28.96 | 13.0 | \$ 376.48 | 15.0 | \$ 434.40 | \$ 434.40 | |
| 1,001-4,100 | \$ 29.73 | 22.0 | \$ 654.06 | 29.0 | \$ 862.17 | \$ 862.17 | |
| 4,101-33,000 | \$ 36.00 | 30.0 | \$ 1,080.00 | 36.0 | \$ 1,296.00 | \$ 1,296.00 | |
| 33,001-96,000 | \$ 36.39 | 59.0 | \$ 2,147.01 | 75.0 | \$ 2,729.25 | \$ 2,729.25 | |
| 96,001-500,000 | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| 500,001-1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| > 1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| Nontransient Noncommunity Water Systems (NTNCWSs) - SW | | | | | | | |
| ≤500 | \$ 25.75 | 4.0 | \$ 103.01 | 6.0 | \$ 154.51 | \$ 154.51 | |
| 501-1,000 | \$ 28.96 | 4.0 | \$ 115.84 | 6.0 | \$ 173.76 | \$ 173.76 | |
| 1,001-4,100 | \$ 29.73 | 4.0 | \$ 118.92 | 6.0 | \$ 178.38 | \$ 178.38 | |
| 4,101-33,000 | \$ 36.00 | 30.0 | \$ 1,080.00 | 36.0 | \$ 1,296.00 | \$ 1,296.00 | |
| 33,001-96,000 | \$ 36.39 | 59.0 | \$ 2,147.01 | 75.0 | \$ 2,729.25 | \$ 2,729.25 | |
| 96,001-500,000 | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| 500,001-1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| > 1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| Nontransient Noncommunity Water Systems (NTNCWSs) - GW | | | | | | | |
| ≤500 | \$ 25.75 | 4.0 | \$ 103.01 | 6.0 | \$ 154.51 | \$ 154.51 | |
| 501-1,000 | \$ 28.96 | 4.0 | \$ 115.84 | 6.0 | \$ 173.76 | \$ 173.76 | |
| 1,001-4,100 | \$ 29.73 | 4.0 | \$ 118.92 | 6.0 | \$ 178.38 | \$ 178.38 | |
| 4,101-33,000 | \$ 36.00 | 30.0 | \$ 1,080.00 | 36.0 | \$ 1,296.00 | \$ 1,296.00 | |
| 33,001-96,000 | \$ 36.39 | 59.0 | \$ 2,147.01 | 75.0 | \$ 2,729.25 | \$ 2,729.25 | |
| 96,001-500,000 | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| 500,001-1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| > 1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| Transient Noncommunity Water Systems (TNCWSs) - SW | | | | | | | |
| ≤500 | \$ 25.75 | 4.0 | \$ 103.01 | 6.0 | \$ 154.51 | \$ 154.51 | |
| 501-1,000 | \$ 28.96 | 4.0 | \$ 115.84 | 6.0 | \$ 173.76 | \$ 173.76 | |
| 1,001-4,100 | \$ 29.73 | 4.0 | \$ 118.92 | 6.0 | \$ 178.38 | \$ 178.38 | |
| 4,101-33,000 | \$ 36.00 | 30.0 | \$ 1,080.00 | 36.0 | \$ 1,296.00 | \$ 1,296.00 | |
| 33,001-96,000 | \$ 36.39 | 59.0 | \$ 2,147.01 | 75.0 | \$ 2,729.25 | \$ 2,729.25 | |
| 96,001-500,000 | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| 500,001-1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| > 1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | |
| ≤500 | \$ 25.75 | 4.0 | \$ 103.01 | 6.0 | \$ 154.51 | \$ 154.51 | |
| 501-1,000 | \$ 28.96 | 4.0 | \$ 115.84 | 6.0 | \$ 173.76 | \$ 173.76 | |
| 1,001-4,100 | \$ 29.73 | 4.0 | \$ 118.92 | 6.0 | \$ 178.38 | \$ 178.38 | |
| 4,101-33,000 | \$ 36.00 | 30.0 | \$ 1,080.00 | 36.0 | \$ 1,296.00 | \$ 1,296.00 | |
| 33,001-96,000 | \$ 36.39 | 59.0 | \$ 2,147.01 | 75.0 | \$ 2,729.25 | \$ 2,729.25 | |
| 96,001-500,000 | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| 500,001-1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |
| > 1 Million | \$ 41.01 | 108.0 | \$ 4,429.08 | 117.0 | \$ 4,798.17 | \$ 4,798.17 | |

Note:

(F) EPA assumes that the burden incurred by operators to assess their PWSs following a second non-acute violation is equal to the burden incurred by an assessment following an acute violation.

Sources:

(A) Labor rates for PWSs from Exhibit 7.1.

(B), (D), (F) Proposed RTRC T&C Document.

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Exhibit 7.12 Net Change in PWS Unit Costs Estimates for Level 1 and Level 2 Assessments (AIP and Alternative Analysis) (2007\$)

| PWS Size (Population Served) | Labor Cost (per hour) | Level 1 Assessments | | Level 2 Assessments | | | |
|---|-----------------------|--|-------------|--------------------------|--------------|---|-------------|
| | | Non-Acute Trigger (single trigger) (hours) | Unit Cost | Acute Violations (hours) | Unit Cost | Level 2 Triggers (triggered by multiple Level 1s) (hours) | Unit Cost |
| | | | | | | | |
| A | B | C=A*B | D | E=A*D | F | G=A*F | |
| Community Water Systems (CWSs) - SW | | | | | | | |
| ≤500 | \$ 25.75 | 19.0 | \$ 489.28 | 23.0 | \$ 592.29 | 22.0 | \$ 566.54 |
| 501-1,000 | \$ 28.96 | 20.0 | \$ 579.20 | 24.0 | \$ 695.04 | 23.0 | \$ 666.08 |
| 1,001-4,100 | \$ 29.73 | 31.0 | \$ 921.63 | 48.0 | \$ 1,427.04 | 46.0 | \$ 1,367.58 |
| 4,101-33,000 | \$ 36.00 | 41.0 | \$ 1,476.00 | 71.0 | \$ 2,556.00 | 69.0 | \$ 2,484.00 |
| 33,001-96,000 | \$ 36.39 | 68.0 | \$ 2,474.52 | 121.0 | \$ 4,403.19 | 116.0 | \$ 4,221.24 |
| 96,001-500,000 | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| 500,001-1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| > 1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| Community Water Systems (CWSs) - GW | | | | | | | |
| ≤500 | \$ 25.75 | 19.0 | \$ 489.28 | 23.0 | \$ 592.29 | 22.0 | \$ 566.54 |
| 501-1,000 | \$ 28.96 | 20.0 | \$ 579.20 | 24.0 | \$ 695.04 | 23.0 | \$ 666.08 |
| 1,001-4,100 | \$ 29.73 | 31.0 | \$ 921.63 | 48.0 | \$ 1,427.04 | 46.0 | \$ 1,367.58 |
| 4,101-33,000 | \$ 36.00 | 41.0 | \$ 1,476.00 | 71.0 | \$ 2,556.00 | 69.0 | \$ 2,484.00 |
| 33,001-96,000 | \$ 36.39 | 68.0 | \$ 2,474.52 | 121.0 | \$ 4,403.19 | 116.0 | \$ 4,221.24 |
| 96,001-500,000 | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| 500,001-1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| > 1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - SW | | | | | | | |
| ≤500 | \$ 25.75 | 7.0 | \$ 180.26 | 21.0 | \$ 540.78 | 9.0 | \$ 231.76 |
| 501-1,000 | \$ 28.96 | 7.0 | \$ 202.72 | 21.0 | \$ 608.16 | 9.0 | \$ 260.64 |
| 1,001-4,100 | \$ 29.73 | 8.0 | \$ 237.84 | 29.0 | \$ 862.17 | 10.0 | \$ 297.30 |
| 4,101-33,000 | \$ 36.00 | 41.0 | \$ 1,476.00 | 71.0 | \$ 2,556.00 | 69.0 | \$ 2,484.00 |
| 33,001-96,000 | \$ 36.39 | 68.0 | \$ 2,474.52 | 121.0 | \$ 4,403.19 | 116.0 | \$ 4,221.24 |
| 96,001-500,000 | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| 500,001-1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| > 1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - GW | | | | | | | |
| ≤500 | \$ 25.75 | 7.0 | \$ 180.26 | 21.0 | \$ 540.78 | 9.0 | \$ 231.76 |
| 501-1,000 | \$ 28.96 | 7.0 | \$ 202.72 | 21.0 | \$ 608.16 | 9.0 | \$ 260.64 |
| 1,001-4,100 | \$ 29.73 | 8.0 | \$ 237.84 | 29.0 | \$ 862.17 | 10.0 | \$ 297.30 |
| 4,101-33,000 | \$ 36.00 | 41.0 | \$ 1,476.00 | 71.0 | \$ 2,556.00 | 69.0 | \$ 2,484.00 |
| 33,001-96,000 | \$ 36.39 | 68.0 | \$ 2,474.52 | 121.0 | \$ 4,403.19 | 116.0 | \$ 4,221.24 |
| 96,001-500,000 | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| 500,001-1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| > 1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| Transient Noncommunity Water Systems (TNCWSs) - SW | | | | | | | |
| ≤500 | \$ 25.75 | 7.0 | \$ 180.26 | 21.0 | \$ 540.78 | 9.0 | \$ 231.76 |
| 501-1,000 | \$ 28.96 | 7.0 | \$ 202.72 | 21.0 | \$ 608.16 | 9.0 | \$ 260.64 |
| 1,001-4,100 | \$ 29.73 | 8.0 | \$ 237.84 | 29.0 | \$ 862.17 | 10.0 | \$ 297.30 |
| 4,101-33,000 | \$ 36.00 | 41.0 | \$ 1,476.00 | 71.0 | \$ 2,556.00 | 69.0 | \$ 2,484.00 |
| 33,001-96,000 | \$ 36.39 | 68.0 | \$ 2,474.52 | 121.0 | \$ 4,403.19 | 116.0 | \$ 4,221.24 |
| 96,001-500,000 | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| 500,001-1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| > 1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | |
| ≤500 | \$ 25.75 | 7.0 | \$ 180.26 | 21.0 | \$ 540.78 | 9.0 | \$ 231.76 |
| 501-1,000 | \$ 28.96 | 7.0 | \$ 202.72 | 21.0 | \$ 608.16 | 9.0 | \$ 260.64 |
| 1,001-4,100 | \$ 29.73 | 8.0 | \$ 237.84 | 29.0 | \$ 862.17 | 10.0 | \$ 297.30 |
| 4,101-33,000 | \$ 36.00 | 41.0 | \$ 1,476.00 | 71.0 | \$ 2,556.00 | 69.0 | \$ 2,484.00 |
| 33,001-96,000 | \$ 36.39 | 68.0 | \$ 2,474.52 | 121.0 | \$ 4,403.19 | 116.0 | \$ 4,221.24 |
| 96,001-500,000 | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| 500,001-1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |
| > 1 Million | \$ 41.01 | 159.0 | \$ 6,520.59 | 252.0 | \$ 10,334.52 | 238.0 | \$ 9,760.38 |

Sources:

- (A) Labor rates for PWSs from Exhibit 7.1.
- (B), (D), (F) Proposed RTCR T&C Document.

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Exhibit 7.13 Number of Level 1 and Level 2 Assessments over the 25-Year Compliance Period

| PWS Size (Population Served) | TCR | | | AIP | | | Alternative Analysis | | |
|---|---|--------------------------|--|--|--------------------------|---|--|--------------------------|---|
| | Level 1 Assessments | Level 2 Assessments | | Level 1 Assessments | Level 2 Assessments | | Level 1 Assessments | Level 2 Assessments | |
| | Non-Acute Violations (single violation) (hours) | Acute Violations (hours) | Non-Acute Violations (multiple violations) (hours) | Non-Acute Trigger (single trigger) (hours) | Acute Violations (hours) | Level 2 Triggers (triggered by multiple Level 1s) (hours) | Non-Acute Trigger (single trigger) (hours) | Acute Violations (hours) | Level 2 Triggers (triggered by multiple Level 1s) (hours) |
| | | | | | | | | | |
| Community Water Systems (CWSs) - SW | | | | | | | | | |
| ≤500 | 1,162 | 336 | 279 | 828 | 247 | 128 | 828 | 247 | 128 |
| 501-1,000 | 339 | 99 | 61 | 254 | 74 | 30 | 254 | 74 | 30 |
| 1,001-4,100 | 931 | 149 | 123 | 846 | 161 | 96 | 846 | 161 | 96 |
| 4,101-33,000 | 2,089 | 115 | - | 2,089 | 115 | - | 2,089 | 115 | - |
| 33,001-96,000 | 475 | 44 | - | 475 | 44 | - | 475 | 44 | - |
| 96,001-500,000 | 203 | 19 | - | 203 | 19 | - | 203 | 19 | - |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 5,199 | 761 | 463 | 4,695 | 659 | 253 | 4,695 | 659 | 253 |
| Community Water Systems (CWSs) - GW | | | | | | | | | |
| ≤500 | 17,231 | 2,314 | 8,817 | 14,662 | 1,686 | 4,735 | 14,806 | 1,707 | 4,827 |
| 501-1,000 | 2,120 | 296 | 909 | 1,811 | 217 | 482 | 1,830 | 219 | 491 |
| 1,001-4,100 | 3,295 | 450 | 1,758 | 2,953 | 358 | 1,079 | 2,953 | 358 | 1,079 |
| 4,101-33,000 | 3,846 | 101 | - | 3,846 | 101 | - | 3,846 | 101 | - |
| 33,001-96,000 | 421 | 10 | - | 421 | 10 | - | 421 | 10 | - |
| 96,001-500,000 | 79 | 2 | - | 79 | 2 | - | 79 | 2 | - |
| 500,001-1 Million | - | 22 | - | - | 22 | - | - | 22 | - |
| > 1 Million | 22 | - | - | 22 | - | - | 22 | - | - |
| Total | 27,014 | 3,195 | 11,484 | 23,795 | 2,395 | 6,296 | 23,958 | 2,418 | 6,397 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - SW | | | | | | | | | |
| ≤500 | 173 | 66 | 106 | 135 | 51 | 54 | 135 | 51 | 54 |
| 501-1,000 | 28 | 10 | 14 | 23 | 8 | 7 | 23 | 8 | 7 |
| 1,001-4,100 | 43 | 16 | 33 | 38 | 12 | 18 | 38 | 12 | 18 |
| 4,101-33,000 | 51 | - | - | 51 | - | - | 51 | - | - |
| 33,001-96,000 | - | - | - | - | - | - | - | - | - |
| 96,001-500,000 | - | - | - | - | - | - | - | - | - |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 294 | 92 | 153 | 247 | 72 | 79 | 247 | 72 | 79 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - GW | | | | | | | | | |
| ≤500 | 8,146 | 1,203 | 5,142 | 7,452 | 932 | 2,791 | 8,942 | 1,210 | 4,339 |
| 501-1,000 | 632 | 88 | 316 | 586 | 74 | 182 | 698 | 89 | 283 |
| 1,001-4,100 | 635 | 131 | 651 | 563 | 87 | 339 | 563 | 87 | 339 |
| 4,101-33,000 | 103 | 6 | - | 103 | 6 | - | 103 | 6 | - |
| 33,001-96,000 | 4 | - | - | 4 | - | - | 4 | - | - |
| 96,001-500,000 | - | - | - | - | - | - | - | - | - |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 9,519 | 1,429 | 6,108 | 8,708 | 1,099 | 3,312 | 10,310 | 1,392 | 4,962 |
| Transient Noncommunity Water Systems (TNCWSs) - SW | | | | | | | | | |
| ≤500 | 1,763 | 710 | 1,316 | 1,376 | 461 | 591 | 1,376 | 461 | 591 |
| 501-1,000 | 86 | 36 | 66 | 66 | 22 | 29 | 66 | 22 | 29 |
| 1,001-4,100 | 102 | 52 | 122 | 90 | 32 | 62 | 90 | 32 | 62 |
| 4,101-33,000 | 4 | - | - | 4 | - | - | 4 | - | - |
| 33,001-96,000 | - | - | - | - | - | - | - | - | - |
| 96,001-500,000 | - | - | - | - | - | - | - | - | - |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 1,956 | 797 | 1,504 | 1,537 | 515 | 682 | 1,537 | 515 | 682 |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | | | |
| ≤500 | 58,114 | 8,777 | 33,187 | 59,291 | 7,674 | 25,355 | 75,856 | 10,443 | 44,636 |
| 501-1,000 | 1,444 | 222 | 859 | 1,388 | 178 | 553 | 1,674 | 234 | 914 |
| 1,001-4,100 | 971 | 204 | 929 | 851 | 152 | 493 | 851 | 152 | 493 |
| 4,101-33,000 | 88 | 5 | - | 88 | 5 | - | 88 | 5 | - |
| 33,001-96,000 | - | - | - | - | - | - | - | - | - |
| 96,001-500,000 | - | - | - | - | - | - | - | - | - |
| 500,001-1 Million | - | - | - | - | - | - | - | - | - |
| > 1 Million | - | - | - | - | - | - | - | - | - |
| Total | 60,617 | 9,209 | 34,975 | 61,617 | 8,009 | 26,400 | 78,469 | 10,834 | 46,043 |
| Grand Total | 104,599 | 15,484 | 54,688 | 100,599 | 12,748 | 37,022 | 119,214 | 15,890 | 58,415 |

Note: Detail may not add due to rounding.

Sources:
 (A), (B), (C) - A.1.z
 (D), (E), (F) - A.2.z
 (G), (H), (I) - A.3.z

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3 Level 1 and Level 2 Assessments

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5 Under the TCR, AIP, and Alternative Analysis, states would incur burden to review
6 completed assessment forms required to be filed by PWSs (or similar reports required by states
7 under the current TCR). State costs are based on the number of PWSs submitting assessment
8 reports. The state labor rate presented in Section 7.2.1 and estimates of labor hours are used to
9 generate state Level 1 and Level 2 assessment unit costs. EPA estimates that state burden to
10 review PWS assessment forms would range from one to eight hours depending on PWS size and
11 type, as well as the level of the assessment. This burden includes any time required to consult
12 with the PWS about the assessment report. Estimates of state unit costs for Level 1 and Level 2
13 assessments are presented in Exhibit 7.14.

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Exhibit 7.14 Net Change in State Unit Costs Estimates for Level 1 and Level 2 Assessments (2007\$)

| PWS Size (Population Served) | Labor Cost (per hour) | Level 1 Assessments | | Level 2 Assessments | | | |
|---|-----------------------|--|-----------|-----------------------------|-----------|---|-----------|
| | | Non-Acute Trigger (single trigger) (hours) | Unit Cost | Acute Violations (hours) | Unit Cost | Level 2 Triggers (triggered by multiple Level 1s) (hours) | Unit Cost |
| | | | | | | | |
| C=A*B | | | | | | | |
| Community Water Systems (CWSs) - SW | | | | | | | |
| ≤500 | \$ 39.22 | 1.0 | \$ 39.22 | 2.0 | \$ 78.44 | 2.0 | \$ 78.44 |
| 501-1,000 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 1,001-4,100 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 4,101-33,000 | \$ 39.22 | 3.0 | \$ 117.65 | 6.0 | \$ 235.31 | 6.0 | \$ 235.31 |
| 33,001-96,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 96,001-500,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 500,001-1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| > 1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| Community Water Systems (CWSs) - GW | | | | | | | |
| ≤500 | \$ 39.22 | 1.0 | \$ 39.22 | 2.0 | \$ 78.44 | 2.0 | \$ 78.44 |
| 501-1,000 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 1,001-4,100 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 4,101-33,000 | \$ 39.22 | 3.0 | \$ 117.65 | 6.0 | \$ 235.31 | 6.0 | \$ 235.31 |
| 33,001-96,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 96,001-500,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 500,001-1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| > 1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - SW | | | | | | | |
| ≤500 | \$ 39.22 | 1.0 | \$ 39.22 | 2.0 | \$ 78.44 | 2.0 | \$ 78.44 |
| 501-1,000 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 1,001-4,100 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 4,101-33,000 | \$ 39.22 | 3.0 | \$ 117.65 | 6.0 | \$ 235.31 | 6.0 | \$ 235.31 |
| 33,001-96,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 96,001-500,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 500,001-1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| > 1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - GW | | | | | | | |
| ≤500 | \$ 39.22 | 1.0 | \$ 39.22 | 2.0 | \$ 78.44 | 2.0 | \$ 78.44 |
| 501-1,000 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 1,001-4,100 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 4,101-33,000 | \$ 39.22 | 3.0 | \$ 117.65 | 6.0 | \$ 235.31 | 6.0 | \$ 235.31 |
| 33,001-96,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 96,001-500,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 500,001-1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| > 1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| Transient Noncommunity Water Systems (TNCWSs) - SW | | | | | | | |
| ≤500 | \$ 39.22 | 1.0 | \$ 39.22 | 2.0 | \$ 78.44 | 2.0 | \$ 78.44 |
| 501-1,000 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 1,001-4,100 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 4,101-33,000 | \$ 39.22 | 3.0 | \$ 117.65 | 6.0 | \$ 235.31 | 6.0 | \$ 235.31 |
| 33,001-96,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 96,001-500,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 500,001-1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| > 1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | |
| ≤500 | \$ 39.22 | 1.0 | \$ 39.22 | 2.0 | \$ 78.44 | 2.0 | \$ 78.44 |
| 501-1,000 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 1,001-4,100 | \$ 39.22 | 2.0 | \$ 78.44 | 4.0 | \$ 156.87 | 4.0 | \$ 156.87 |
| 4,101-33,000 | \$ 39.22 | 3.0 | \$ 117.65 | 6.0 | \$ 235.31 | 6.0 | \$ 235.31 |
| 33,001-96,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 96,001-500,000 | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| 500,001-1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |
| > 1 Million | \$ 39.22 | 4.0 | \$ 156.87 | 8.0 | \$ 313.74 | 8.0 | \$ 313.74 |

Sources:

- (A) Labor rates for state employee from Section 7.2.1.
- (B), (D), (E) Labor hour assumptions based on best professional judgement.

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1
2 *Assessment Net Cost Summary*
3

4 Annualized cost estimates for Level 1 and Level 2 assessments under the TCR, AIP, and
5 Alternative Analysis are calculated by multiplying the number of assessments estimated by the
6 predictive modeling (summarized in Exhibit 7.13) by the unit costs presented in Exhibits 7.11,
7 7.12, and 7.14. (Appendix A provides a detailed breakout of the number of Level 1 and Level 2
8 assessments estimated by the occurrence model.) Annualized cost estimates are presented in
9 Exhibit 7.15 below.

10
11 Under the AIP, the overall number of assessments (both Level 1 and Level 2) decreases
12 as a function of reduced occurrence over time. However, PWS costs increase slightly due to the
13 higher unit cost of performing assessments compared to existing practices under the TCR. For
14 states, the reduction in the number of assessments is estimated to translate directly to a small cost
15 savings. The total net change in cost is estimated to be positive.

16
17 The overall number of assessments increases for under the Alternative Analysis. This is
18 a result of the initial monthly monitoring requirements for all PWSs under this analysis. The
19 modeling results indicate that the much higher sampling early in the implementation period,
20 results in more positive samples and associated assessments despite the predicted long term
21 reductions in occurrence. This increase in total assessments performed, combined with the
22 higher unit cost of performing assessments compared to existing practices under the TCR, results
23 in a higher net cost increase than under the AIP. For states, the increase in the number of
24 assessments is estimated to translate directly to a cost increase. The total net change in cost for
25 the Alternative Analysis is estimated to be positive, and greater than under the AIP.
26
27

28 **Exhibit 7.15 Annualized PWS and State Costs Estimates for Level 1 and Level 2**
29 **Assessments (\$Millions, 2007\$)**
30

| | PWSs | State | Total | PWSs | State | Total |
|--|------------------|-----------|---------|------------------|-----------|---------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| Level 1 Assessment | | | | | | |
| TCR - Total | \$ 1.03 | \$ 0.20 | \$ 1.24 | \$ 0.99 | \$ 0.19 | \$ 1.19 |
| AIP - Total | \$ 1.52 | \$ 0.19 | \$ 1.71 | \$ 1.46 | \$ 0.19 | \$ 1.65 |
| AIP - Net Change | \$ 0.49 | \$ (0.01) | \$ 0.48 | \$ 0.47 | \$ (0.01) | \$ 0.46 |
| Alternative Analysis - Total | \$ 1.67 | \$ 0.23 | \$ 1.90 | \$ 1.63 | \$ 0.22 | \$ 1.85 |
| Alternative Analysis - Net Change | \$ 0.64 | \$ 0.03 | \$ 0.66 | \$ 0.64 | \$ 0.03 | \$ 0.67 |
| Level 2 Assessment | | | | | | |
| TCR - Total | \$ 0.63 | \$ 0.24 | \$ 0.87 | \$ 0.61 | \$ 0.23 | \$ 0.84 |
| AIP - Total | \$ 0.81 | \$ 0.17 | \$ 0.99 | \$ 0.79 | \$ 0.17 | \$ 0.96 |
| AIP - Net Change | \$ 0.18 | \$ (0.07) | \$ 0.11 | \$ 0.19 | \$ (0.06) | \$ 0.12 |
| Alternative Analysis - Total | \$ 1.12 | \$ 0.26 | \$ 1.39 | \$ 1.15 | \$ 0.27 | \$ 1.43 |
| Alternative Analysis - Net Change | \$ 0.49 | \$ 0.02 | \$ 0.51 | \$ 0.55 | \$ 0.04 | \$ 0.59 |

Note: Detail may not add due to independent rounding.

Source: Proposed RTCR Cost Model.

1 **7.4.6 Corrective Actions**

2
3 *PWSs*

4
5 Under the AIP and Alternative Analysis, all PWSs would be required to correct sanitary
6 defects found through the performance of Level 1 or Level 2 assessments. For modeling
7 purposes, EPA estimated only the net change in the number of corrective actions performed
8 under the AIP and Alternative Analysis⁶. Based on discussions with state representatives, EPA
9 estimates that additional corrective actions would be performed for only 10% of the assessments
10 undertaken as a result of the proposed RTCR. Because only the net change in costs is estimated,
11 no additional costs for corrective actions are modeled for the existing TCR.

12
13 To estimate the costs incurred for the correction of sanitary defects, EPA estimated the
14 percent distribution of PWSs that would perform different types of corrective actions as
15 presented in the compliance forecast below (Exhibit 7.16). The compliance forecast presented
16 below was informed by discussions by the TCRDSAC Technical Work Group and focuses on the
17 higher level categorization of corrective actions anticipated. For each of the categories listed, a
18 PWS is assumed to take a specific action that falls under that general category. Detailed
19 compliance forecasts showing the specific corrective actions used in the cost analysis are
20 provided in Appendix D, along with summary tables of the unit costs used in the analysis. Each
21 corrective action in the detailed compliance forecast is also assigned a representative unit cost.
22 Detailed descriptions of the derivation of unit costs are provided in the *Technology and Cost*
23 *Document for the Revised Total Coliform Rule* (USEPA, 2009a).

24
25 As shown in the compliance forecast in Exhibit 7.16, EPA estimates that corrective
26 actions found through Level 1 assessments would result in corrective actions that focus more on
27 transient solutions (flushing) or training (columns A and B) than on permanent fixes to the PWS.
28 This reflects the assumption that Level 1 assessments would generally be less involved than
29 Level 2 assessments and may not result in finding more complex problems. Corrective actions
30 taken as a result of Level 2 assessments are expected to find a higher proportion of
31 structural/technical issues (columns C-K) resulting in material fixes to the PWSs and distribution
32 system.⁷

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⁶ Any corrective actions based on a positive source water sample are assumed to be accounted for under the GWR and not under the proposed RTCR.

⁷ Additionally, EPA ran two sensitivity analyses to assess the potential impacts of different distributions within the compliance forecast. Results of the sensitivity analyses are presented in Section 7.7.

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Exhibit 7.16 PWS Compliance Forecast for Corrective Actions based on Level 1 and Level 2 Assessments

| PWS Size (Population Served) | PWS Flushing | Sampler Training | Replace/Repair of Distribution System Components | Maintenance of Adequate Pressure | Maintenance of appropriate Hydraulic Residence Time | Storage Facility Maintenance | Booster Disinfection | connection Control and Backflow Prevention Program | Addition or Upgrade of On-line Monitoring and Control | Addition of Security Measures | Development and Implementation of an Operations Plan |
|------------------------------------|-----------------|---------------------|---|--|--|------------------------------------|-------------------------|--|---|-------------------------------------|---|
| | A | B | C | D | E | F | G | H | I | J | K |
| Level 1 Compliance Forecast | | | | | | | | | | | |
| ≤500 | 39% | 15% | 12% | 9% | 8% | 6% | 4% | 1% | 3% | 1% | 2% |
| 501-1,000 | 39% | 15% | 12% | 9% | 8% | 6% | 4% | 1% | 3% | 1% | 2% |
| 1,001-4,100 | 39% | 15% | 12% | 9% | 8% | 6% | 4% | 1% | 3% | 1% | 2% |
| 4,101-33,000 | 39% | 15% | 12% | 9% | 8% | 6% | 4% | 1% | 3% | 1% | 2% |
| 33,001-96,000 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 96,001-500,000 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 500,001-1 Million | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| > 1 Million | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Level 2 Compliance Forecast | | | | | | | | | | | |
| ≤500 | 15% | 4% | 18% | 15% | 15% | 11% | 8% | 2% | 6% | 2% | 4% |
| 501-1,000 | 15% | 4% | 18% | 15% | 15% | 11% | 8% | 2% | 6% | 2% | 4% |
| 1,001-4,100 | 15% | 4% | 18% | 15% | 15% | 11% | 8% | 2% | 6% | 2% | 4% |
| 4,101-33,000 | 15% | 4% | 18% | 15% | 15% | 11% | 8% | 2% | 6% | 2% | 4% |
| 33,001-96,000 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 96,001-500,000 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 500,001-1 Million | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| > 1 Million | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

Source:
(A) - (K) Percent of PWSs performing corrective actions based on level 1 and level 2 assessments reflect EPA estimate.

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PWSs would also incur reporting and recordkeeping burden to notify the state upon completion of each corrective action. PWSs may also consult with the state or with outside parties to determine the appropriate corrective action to be implemented. PWS reporting and recordkeeping costs (including consultations) are derived by multiplying PWSs labor rates (Section 7.2.1) by an EPA-estimated labor burden. Exhibit 7.17 presents the estimated unit costs for this reporting and recordkeeping burden.

States

For each corrective action performed under AIP and Alternative Analysis, states would incur recordkeeping and reporting burden to review and coordinate with PWSs. This includes burden incurred from any optional consultations states may conduct with PWSs or outside parties to determine the appropriate corrective action to be implemented. The state labor rate presented in Section 7.2.1 and estimates of labor hours are used to generate state unit corrective action costs. Exhibit 7.17 presents the estimated PWS and state reporting and recordkeeping unit costs (including consultations) by PWS size.

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Exhibit 7.17 Net Change in PWS and State Unit Costs Estimates for Reporting and Recordkeeping for Corrective Actions (2007\$)

| PWS Size (Population Served) | Systems | | | States | | |
|---------------------------------|--------------------------|---|-----------|--------------------------|---|-----------|
| | Labor Cost (per hour) | Corrective Action Burden (hours/corrective action) | Unit Cost | Labor Cost (per hour) | Corrective Action Burden (hours/corrective action) | Unit Cost |
| | A | B | C=A*B | D | E | F=D*E |
| ≤500 | \$ 25.75 | 0.5 | \$ 12.88 | \$ 39.22 | 0.5 | \$ 19.61 |
| 501-1,000 | \$ 28.96 | 0.5 | \$ 14.48 | \$ 39.22 | 0.5 | \$ 19.61 |
| 1,001-4,100 | \$ 29.73 | 0.5 | \$ 14.87 | \$ 39.22 | 0.5 | \$ 19.61 |
| 4,101-33,000 | \$ 36.00 | 0.5 | \$ 18.00 | \$ 39.22 | 0.5 | \$ 19.61 |
| 33,001-96,000 | \$ 36.39 | 0.5 | \$ 18.20 | \$ 39.22 | 0.5 | \$ 19.61 |
| 96,001-500,000 | \$ 41.01 | 0.5 | \$ 20.51 | \$ 39.22 | 0.5 | \$ 19.61 |
| 500,001-1 Million | \$ 41.01 | 0.5 | \$ 20.51 | \$ 39.22 | 0.5 | \$ 19.61 |
| > 1 Million | \$ 41.01 | 0.5 | \$ 20.51 | \$ 39.22 | 0.5 | \$ 19.61 |

Notes:

PWS and state burden estimates identical for all PWS types under TCR, AIP, and Alternative Analysis.

Sources:

- (A) Labor rates for PWSs from Exhibit 7.1.
- (B) PWS labor hours for corrective action recordkeeping/reporting reflect EPA estimate.
- (D) Labor rates for state employee from Section 7.2.1.
- (E) State labor hours for corrective action recordkeeping/reporting reflect EPA estimate.

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Corrective Action Net Cost Summary

Annualized cost estimates for PWSs and states to perform corrective actions are estimated by multiplying the number of Level 1 and Level 2 corrective actions estimated by the predictive model (i.e., 10 percent of Level 1 and Level 2 assessments), by the percentages in the compliance forecast and unit costs of corrective actions and associated reporting and recordkeeping. The total and net change costs of corrective actions are shown in Exhibit 7.18.

Because only the next change in corrective actions taken is modeled, no costs are estimated under the TCR. The differences in the net change in corrective action costs between the AIP and Alternative Analysis are a function different number of assessments estimated to be performed in the predictive model as discussed in Section 7.4.5 above.

1
2 **Exhibit 7.18 Annualized PWS and State Cost Estimates for Corrective Actions**
3 **based on Level 1 and Level 2 Assessments (\$Millions, 2007\$)**
4

| | PWSs | State | Total | PWSs | State | Total |
|--|------------------|---------|---------|------------------|---------|---------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| Corrective Actions based on Level 1 Assessments | | | | | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 6.80 | \$ 0.09 | \$ 6.89 | \$ 5.80 | \$ 0.08 | \$ 5.88 |
| AIP - Net Change | \$ 6.80 | \$ 0.09 | \$ 6.89 | \$ 5.80 | \$ 0.08 | \$ 5.88 |
| Alternative Analysis - Total | \$ 7.37 | \$ 0.10 | \$ 7.47 | \$ 6.36 | \$ 0.09 | \$ 6.45 |
| Alternative Analysis - Net Change | \$ 7.37 | \$ 0.10 | \$ 7.47 | \$ 6.36 | \$ 0.09 | \$ 6.45 |
| Corrective Actions based on Level 2 Assessments | | | | | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 2.57 | \$ 0.05 | \$ 2.62 | \$ 2.29 | \$ 0.04 | \$ 2.33 |
| AIP - Net Change | \$ 2.57 | \$ 0.05 | \$ 2.62 | \$ 2.29 | \$ 0.04 | \$ 2.33 |
| Alternative Analysis - Total | \$ 3.59 | \$ 0.06 | \$ 3.65 | \$ 3.40 | \$ 0.05 | \$ 3.45 |
| Alternative Analysis - Net Change | \$ 3.59 | \$ 0.06 | \$ 3.65 | \$ 3.40 | \$ 0.05 | \$ 3.45 |

Note: Detail may not add due to independent rounding.

Source: Proposed RTCR Cost Model.

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8 **7.4.7 Public Notification**
9

10 *PWSs*

11
12 Tier 1 Public Notification
13

14 Acute violations (*E.coli* MCL violations) would require Tier 1 public notification under
15 all regulatory scenarios (TCR, AIP, and Alternative Analysis). PWSs with acute violations must
16 report the violation to the state by the end of the business day after the PWS learns of the
17 violation and must notify the public within 24 hours.

18
19 Tier 2 Public Notification

20 PWSs with non-acute violations under the current TCR must report the violation to the
21 state by the end of the business day after the PWS learns of the violation, and must provide Tier
22 2 public notification within 30 days. PWSs with similar violations under the AIP and Alternative
23 Analysis are not required to perform public notification (PN). These PWSs are required to
24 perform Tier 2 notification for a treatment technique violation (failure to perform Level 1 or 2
25 assessment if triggered; failure to correct all sanitary defects), but because the cost model
26 assumes full compliance with proposed RTCR requirements, no cost is estimated for these
27 violations. Overall, costs decrease significantly for Tier 2 public notification under the proposed
28 RTCR for both the AIP and Alternative Analysis.

29
30 Tier 3 Public Notification
31

32 Under the TCR, AIP, and Alternative Analysis, Tier 3 public notification for monitoring
33 and reporting violations are assumed to be reported once per year as part of the Consumer
34 Confidence Report (CCR). Because of the use of the CCR to communicate Tier 3 public
35 notification on a yearly basis, no cost differential between the current TCR and the AIP and
36 Alternative Analysis is estimated in the cost model. However, although they are not

1 quantitatively evaluated as part of the EA, the TCRDSAC concluded that significant reductions
2 in monitoring and reporting violations may be realized through the revised regulatory framework
3 of the proposed RTCR. Resources used to process monitoring violation notices for the CCR (as
4 well as the time spent responding to customer inquiries about the notices) may be reduced if
5 significant reductions are realized. Exclusion of this potential cost savings may lead to an
6 underestimate of the PN cost savings under both the AIP and Alternative Analysis.
7

8 Estimates of PWS unit costs for PN are derived by multiplying PWS labor rates from
9 Section 7.2.1 and burden hour estimates derived from the *Draft Information Collection Request*
10 *for the Public Water System Supervision Program* (USEPA, 2008c). PWS PN unit cost
11 estimates are presented in Exhibit 7.19.
12
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Exhibit 7.19 PWS Unit Cost Estimates for Public Notification (2007\$)

| PWS Size (Population Served) | Labor Cost (per hour) A | Average Number of Service Connections per System B | Tier 1 (acute) | | | | Unit Cost F=A*(C+D)+(B*E) | Tier 2 (non-acute) | | | |
|---|----------------------------|---|--|---|---|--|------------------------------|---|---|------------------------------|--|
| | | | Preparation (labor) (hours/violation) C | Distribution (labor) (hours/violation) D | Distribution (O&M Cost/notice) (\$/service connection) E | Preparation (labor) (hours/violation) G | | Distribution (labor) (hours/violation) H | Distribution (O&M Cost/notice) (\$/service connection) I | Unit Cost J=A*(G+H)+(B*I) | |
| | | | | | | | | | | | |
| Community Water Systems (CWSs) - SW | | | | | | | | | | | |
| ≤500 | \$ 25.75 | 405 | 8.5 | 12.0 | \$ 0.05 | \$ 548.18 | 3.5 | 9.0 | \$ 0.05 | \$ 342.17 | |
| 501-1,000 | \$ 28.96 | 303 | 8.5 | 12.0 | \$ - | \$ 593.68 | 3.5 | 30.0 | \$ 0.26 | \$ 1,049.05 | |
| 1,001-4,100 | \$ 29.73 | 850 | 8.5 | 12.0 | \$ - | \$ 609.47 | 3.5 | 30.0 | \$ 0.26 | \$ 1,216.99 | |
| 4,101-33,000 | \$ 36.00 | 4,288 | 9.2 | 12.0 | \$ - | \$ 763.66 | 3.5 | 30.0 | \$ 0.25 | \$ 2,259.65 | |
| 33,001-96,000 | \$ 36.39 | 17,273 | 10.0 | 12.0 | \$ - | \$ 800.58 | 3.5 | 30.0 | \$ 0.23 | \$ 5,191.88 | |
| 96,001-500,000 | \$ 41.01 | 56,465 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 30.0 | \$ 0.23 | \$ 14,360.67 | |
| 500,001-1 Million | \$ 41.01 | 205,609 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 30.0 | \$ 0.23 | \$ 48,663.97 | |
| > 1 Million | \$ 41.01 | 448,564 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 30.0 | \$ 0.23 | \$ 104,543.57 | |
| Community Water Systems (CWSs) - GW | | | | | | | | | | | |
| ≤500 | \$ 25.75 | 72 | 8.5 | 12.0 | \$ 0.05 | \$ 531.52 | 3.5 | 9.0 | \$ 0.05 | \$ 325.51 | |
| 501-1,000 | \$ 28.96 | 315 | 8.5 | 12.0 | \$ - | \$ 593.68 | 3.5 | 30.0 | \$ 0.26 | \$ 1,052.07 | |
| 1,001-4,100 | \$ 29.73 | 756 | 8.5 | 12.0 | \$ - | \$ 609.47 | 3.5 | 30.0 | \$ 0.26 | \$ 1,192.61 | |
| 4,101-33,000 | \$ 36.00 | 3,495 | 9.0 | 12.0 | \$ - | \$ 757.48 | 3.5 | 30.0 | \$ 0.25 | \$ 2,076.93 | |
| 33,001-96,000 | \$ 36.39 | 16,366 | 10.0 | 12.0 | \$ - | \$ 800.58 | 3.5 | 30.0 | \$ 0.23 | \$ 4,983.17 | |
| 96,001-500,000 | \$ 41.01 | 50,564 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 30.0 | \$ 0.23 | \$ 13,003.50 | |
| 500,001-1 Million | \$ 41.01 | 209,220 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 30.0 | \$ 0.23 | \$ 49,494.49 | |
| > 1 Million | \$ 41.01 | 473,641 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 30.0 | \$ 0.23 | \$ 110,311.34 | |
| Nontransient Noncommunity Water Systems (NTNCWSs) - SW | | | | | | | | | | | |
| ≤500 | \$ 25.75 | 74 | 8.5 | 12.0 | \$ 0.05 | \$ 531.61 | 3.5 | 9.0 | \$ 0.05 | \$ 325.60 | |
| 501-1,000 | \$ 28.96 | 46 | 8.5 | 12.0 | \$ - | \$ 593.68 | 3.5 | 9.0 | \$ 0.05 | \$ 364.29 | |
| 1,001-4,100 | \$ 29.73 | 47 | 8.5 | 12.0 | \$ - | \$ 609.47 | 3.5 | 9.0 | \$ 0.05 | \$ 373.97 | |
| 4,101-33,000 | \$ 36.00 | 176 | 8.7 | 12.0 | \$ - | \$ 745.36 | 3.5 | 9.0 | \$ 0.05 | \$ 458.08 | |
| 33,001-96,000 | \$ 36.39 | 94 | 10.0 | 12.0 | \$ - | \$ 800.58 | 3.5 | 9.0 | \$ 0.02 | \$ 456.75 | |
| 96,001-500,000 | \$ 41.01 | 2,181 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 556.25 | |
| 500,001-1 Million | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |
| > 1 Million | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |
| Nontransient Noncommunity Water Systems (NTNCWSs) - GW | | | | | | | | | | | |
| ≤500 | \$ 25.75 | 6 | 8.5 | 12.0 | \$ 0.05 | \$ 528.20 | 3.5 | 9.0 | \$ 0.05 | \$ 322.19 | |
| 501-1,000 | \$ 28.96 | 11 | 8.5 | 12.0 | \$ - | \$ 593.68 | 3.5 | 9.0 | \$ 0.05 | \$ 362.56 | |
| 1,001-4,100 | \$ 29.73 | 42 | 8.5 | 12.0 | \$ - | \$ 609.47 | 3.5 | 9.0 | \$ 0.05 | \$ 373.71 | |
| 4,101-33,000 | \$ 36.00 | 130 | 8.7 | 12.0 | \$ - | \$ 744.94 | 3.5 | 9.0 | \$ 0.05 | \$ 456.02 | |
| 33,001-96,000 | \$ 36.39 | 75 | 10.0 | 12.0 | \$ - | \$ 800.58 | 3.5 | 9.0 | \$ 0.02 | \$ 456.38 | |
| 96,001-500,000 | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |
| 500,001-1 Million | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |
| > 1 Million | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |
| Transient Noncommunity Water Systems (TNCWSs) - SW | | | | | | | | | | | |
| ≤500 | \$ 25.75 | 15 | 8.5 | 12.0 | \$ 0.05 | \$ 528.64 | 3.5 | 9.0 | \$ 0.05 | \$ 322.62 | |
| 501-1,000 | \$ 28.96 | 49 | 8.5 | 12.0 | \$ - | \$ 593.68 | 3.5 | 9.0 | \$ 0.05 | \$ 364.45 | |
| 1,001-4,100 | \$ 29.73 | 58 | 8.5 | 12.0 | \$ - | \$ 609.47 | 3.5 | 9.0 | \$ 0.05 | \$ 374.50 | |
| 4,101-33,000 | \$ 36.00 | 57 | 8.8 | 12.0 | \$ - | \$ 747.00 | 3.5 | 9.0 | \$ 0.05 | \$ 452.55 | |
| 33,001-96,000 | \$ 36.39 | - | 10.0 | 12.0 | \$ - | \$ 800.58 | 3.5 | 9.0 | \$ 0.02 | \$ 454.88 | |
| 96,001-500,000 | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |
| 500,001-1 Million | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |
| > 1 Million | \$ 41.01 | 2 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.67 | |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | | | | | |
| ≤500 | \$ 25.75 | 8 | 8.5 | 12.0 | \$ 0.05 | \$ 528.30 | 3.5 | 9.0 | \$ 0.05 | \$ 322.29 | |
| 501-1,000 | \$ 28.96 | 30 | 8.5 | 12.0 | \$ - | \$ 593.68 | 3.5 | 9.0 | \$ 0.05 | \$ 363.51 | |
| 1,001-4,100 | \$ 29.73 | 43 | 8.5 | 12.0 | \$ - | \$ 609.47 | 3.5 | 9.0 | \$ 0.05 | \$ 373.77 | |
| 4,101-33,000 | \$ 36.00 | 39 | 8.7 | 12.0 | \$ - | \$ 746.87 | 3.5 | 9.0 | \$ 0.05 | \$ 451.77 | |
| 33,001-96,000 | \$ 36.39 | 14 | 10.0 | 12.0 | \$ - | \$ 800.58 | 3.5 | 9.0 | \$ 0.02 | \$ 455.15 | |
| 96,001-500,000 | \$ 41.01 | 9 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.81 | |
| 500,001-1 Million | \$ 41.01 | 1 | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.65 | |
| > 1 Million | \$ 41.01 | - | 10.0 | 12.0 | \$ - | \$ 902.22 | 3.5 | 9.0 | \$ 0.02 | \$ 512.63 | |

Notes:
 (B) Service connections per system is consistent with SDWIS 2007 4th Quarter Freeze data. Data for certain size categories (e.g., <500, 501-1,000) may seem counterintuitive. EPA is investigating the SDWIS database for any data discrepancies.
 (F), (J) used to derived TCR PN costs; (F) used to derive AIP and Alternative Analysis PN costs.
 Sources:
 (A) Labor rates for PWSs from Exhibit 7.1.
 (B) SDWIS 2007 4th Quarter Freeze.
 (C), (D), (G), (H) Labor hour assumptions based on best professional judgement as carried forward from the *Draft Information Collection Request for the Public Water System Supervision Program* (USEPA, 2008k).
 (E), (I) Distribution cost assumptions based on best professional judgement as carried forward from the original PN ICR.

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States

Under the TCR, AIP, and Alternative Analysis, states would incur recordkeeping and reporting burden to provide consultation, review the public notification certification, and file the report of the violation. State unit PN costs are based on the state labor rate presented in Section 7.2.1 and burden hour estimates derived from the *Draft Information Collection Request for the Public Water System Supervision Program* (USEPA, 2008c). Estimates of state unit costs for PN are presented in Exhibit 7.20.

1 **Exhibit 7.20 State Unit Costs Estimates for Public Notification (TCR, AIP,**
 2 **Alternative Analysis)**
 3

| Labor Cost (per hour) | Tier 1 Consultation (labor) (hours/violation) | Tier 2 Consultation (labor) (hours/violation) | Receive/Review PN Certification (labor) (hours/violation) | File Reports (labor) (hours/violation) | Tier 1 Unit Cost | Tier 2 Unit Cost |
|-----------------------|---|---|---|--|------------------|------------------|
| A | B | C | D | E | F=A*(B+D+E) | G=A*(C+D+E) |
| \$ 39.22 | 3.0 | 1.1 | \$ 0.20 | \$ 0.10 | \$ 129.42 | \$ 54.91 |

Sources:

(A) Labor rate for state employee from Section 7.2.1.

(B), (C), (D), (E) Labor hour assumptions based on best professional judgement as carried forward from the Draft Information Collection Request for the Public Water System Supervision Program (USEPA, 2008x).

4
5
6 *Public Notification Net Cost Summary*

7
8 Total and net change in annualized net present value costs for PN are estimated by
 9 multiplying the model estimates of PWSs with acute (Tier 1 public notification) and non-acute
 10 (Tier 2 public notification) violations by the PWS and state unit costs for performing PN
 11 activities. The proposed RTCR Cost Model assumes that all violations are addressed following
 12 initial PN, and no burden would be incurred by PWSs or states for repeat notification. Exhibit
 13 7.21 summarizes the total number of Tier 1 and Tier 2 public notifications that would be
 14 prepared by PWS size and category for under the TCR, AIP, and Alternative Analysis over the
 15 entire 25 year period of analysis. Annualized total and net cost estimates for PWSs and states to
 16 perform public notification under the TCR, AIP, and Alternative Analysis are presented in
 17 Exhibit 7.22.

18
19 A significant reduction in costs is estimated due to the elimination of Tier 2 public
 20 notification under the AIP and Alternative Analysis. Because state costs are calculated on a per-
 21 violation basis, state costs decline. Under the Alternative analysis, some of this cost decrease is
 22 offset by additional Tier 1 public notification.
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Exhibit 7.21 Number of Tier 1 and Tier 2 Public Notifications over the 25-Year Compliance Period

| PWS Size (Population Served) | TCR | | AIP | Alternative Analysis |
|---|---------------|----------------|---------------|-------------------------|
| | Tier 1 PN | Tier 2 PN | Tier 1 PN | Tier 1 PN |
| | A | B | C | D |
| Community Water Systems (CWSs) - SW | | | | |
| ≤500 | 336 | 1,441 | 375 | 375 |
| 501-1,000 | 99 | 400 | 103 | 103 |
| 1,001-4,100 | 149 | 1,055 | 256 | 256 |
| 4,101-33,000 | 115 | 2,089 | 115 | 115 |
| 33,001-96,000 | 44 | 475 | 44 | 44 |
| 96,001-500,000 | 19 | 203 | 19 | 19 |
| 500,001-1 Million | - | - | - | - |
| > 1 Million | - | - | - | - |
| Total | 761 | 5,662 | 912 | 912 |
| Community Water Systems (CWSs) - GW | | | | |
| ≤500 | 2,314 | 26,048 | 6,421 | 6,533 |
| 501-1,000 | 296 | 3,029 | 698 | 710 |
| 1,001-4,100 | 450 | 5,053 | 1,437 | 1,437 |
| 4,101-33,000 | 101 | 3,846 | 101 | 101 |
| 33,001-96,000 | 10 | 421 | 10 | 10 |
| 96,001-500,000 | 2 | 79 | 2 | 2 |
| 500,001-1 Million | 22 | - | 22 | 22 |
| > 1 Million | - | 22 | - | - |
| Total | 3,195 | 38,498 | 8,690 | 8,814 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - SW | | | | |
| ≤500 | 66 | 279 | 105 | 105 |
| 501-1,000 | 10 | 42 | 16 | 16 |
| 1,001-4,100 | 16 | 75 | 30 | 30 |
| 4,101-33,000 | - | 51 | - | - |
| 33,001-96,000 | - | - | - | - |
| 96,001-500,000 | - | - | - | - |
| 500,001-1 Million | - | - | - | - |
| > 1 Million | - | - | - | - |
| Total | 92 | 447 | 151 | 151 |
| Nontransient Noncommunity Water Systems (NTNCWSs) - GW | | | | |
| ≤500 | 1,203 | 13,288 | 3,723 | 5,549 |
| 501-1,000 | 88 | 948 | 255 | 373 |
| 1,001-4,100 | 131 | 1,285 | 426 | 426 |
| 4,101-33,000 | 6 | 103 | 6 | 6 |
| 33,001-96,000 | - | 4 | - | - |
| 96,001-500,000 | - | - | - | - |
| 500,001-1 Million | - | - | - | - |
| > 1 Million | - | - | - | - |
| Total | 1,429 | 15,628 | 4,411 | 6,354 |
| Transient Noncommunity Water Systems (TNCWSs) - SW | | | | |
| ≤500 | 710 | 3,079 | 1,052 | 1,052 |
| 501-1,000 | 36 | 152 | 51 | 51 |
| 1,001-4,100 | 52 | 225 | 94 | 94 |
| 4,101-33,000 | - | 4 | - | - |
| 33,001-96,000 | - | - | - | - |
| 96,001-500,000 | - | - | - | - |
| 500,001-1 Million | - | - | - | - |
| > 1 Million | - | - | - | - |
| Total | 797 | 3,460 | 1,197 | 1,197 |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | |
| ≤500 | 8,777 | 91,300 | 33,028 | 55,079 |
| 501-1,000 | 222 | 2,304 | 730 | 1,148 |
| 1,001-4,100 | 204 | 1,900 | 645 | 645 |
| 4,101-33,000 | 5 | 88 | 5 | 5 |
| 33,001-96,000 | - | - | - | - |
| 96,001-500,000 | - | - | - | - |
| 500,001-1 Million | - | - | - | - |
| > 1 Million | - | - | - | - |
| Total | 9,209 | 95,592 | 34,409 | 56,877 |
| Grand Total | 15,484 | 159,287 | 49,770 | 74,305 |

Note: Detail may not add due to rounding.

Sources:

(A), (B) - A.1.z

(C) - A.2.z

(D) - A.3.z

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2 **Exhibit 7.22 Annualized PWS and State Costs Estimates for Public Notification**
3 **(\$Millions, 2007\$)**
4

| | PWSs | State | Total | PWSs | State | Total |
|--|------------------|-----------|-----------|------------------|-----------|-----------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| TCR - Total | \$ 3.51 | \$ 0.42 | \$ 3.93 | \$ 3.37 | \$ 0.41 | \$ 3.78 |
| AIP - Total | \$ 1.06 | \$ 0.26 | \$ 1.32 | \$ 1.03 | \$ 0.25 | \$ 1.28 |
| AIP - Net Change | \$ (2.45) | \$ (0.17) | \$ (2.61) | \$ (2.34) | \$ (0.16) | \$ (2.49) |
| AIP - Percent Change | -70% | -39% | -67% | -69% | -39% | -66% |
| Alternative Analysis - Total | \$ 1.66 | \$ 0.40 | \$ 2.06 | \$ 1.73 | \$ 0.42 | \$ 2.15 |
| Alternative Analysis - Net Change | \$ (1.85) | \$ (0.02) | \$ (1.87) | \$ (1.64) | \$ 0.01 | \$ (1.62) |
| Alternative Analysis - Percent Change | -53% | -5% | -48% | -49% | 4% | -43% |

Note: Detail may not add due to independent rounding.
Source: Proposed RTCR Cost Model.

5
6
7 **7.4.8 Uncertainty in Unit Costs**
8

9 As stated in Section 7.2.5, EPA recognizes that there are both variability and uncertainty
10 in unit cost estimates used to develop national costs for the proposed RTCR. Variability is
11 expected in the actual costs that would be experienced by different PWSs of similar size
12 conducting the same corrective action. Otherwise similar PWSs may experience different capital
13 and/or O&M costs due to site-specific factors. Inputs to unit costs such as water quality
14 conditions, labor rates, and land costs can be highly variable and increase the system-to-system
15 variability in unit costs. In developing the unit cost estimates, there is insufficient information to
16 fully characterize what the distribution of this variability would be on a national scale; therefore,
17 EPA uses mean values for these input parameters.

18
19 The unit costs used in this EA are developed as average or representative estimates of
20 what these unit costs would be nationally, and are not the unit costs of any particular PWS.
21 Some components of monitoring costs, such as the purchase and wear-and-tear of vehicles, are
22 not quantified because of either limited data or inability to attribute these costs directly to the
23 proposed RTCR. Additionally, the PWS and state labor hours for each rule component
24 (specifically for Level 1 and Level 2 assessments) are meant to capture national averages for the
25 purposes of developing national cost estimates and making comparisons between regulatory
26 alternatives. Thus, the unit costs presented in this document may over- or under-estimate the
27 unit costs of any particular PWS. Detailed information on the derivation of unit costs for each
28 rule component is provided in the *Technology and Cost Document for the Revised Total*
29 *Coliform Rule* (USEPA, 2009a).
30

31
32 **7.5 Household Costs**
33

34 EPA assumes that PWSs may pass some or all costs (or savings) of a regulation on to
35 their consumers through rate changes. Only CWSs are included in this analysis because they are
36 the only PWSs that serve households directly. Household costs, which are in units of \$ per
37 household per year, are estimated in this section to provide a measure of the change in water bills
38 that would be expected to result from the proposed RTCR.
39

40 To calculate household costs, the CWS population subject to the proposed RTCR by
41 PWS size is divided by the average number of people per household, estimated as 2.56 for the

1 year 2007 (*U.S. Census Bureau Annual Social and Economic Supplement, 2008*), to calculate the
2 number of households subject to the proposed RTCR by PWS size. The cost of the rule, by size
3 category, is then divided by that number of households to determine a per-household cost.
4

5 The first section of Exhibit 7.23 presents net costs per household under the AIP and
6 Alternative Analysis for all rule components spread across all CWSs. In this scenario,
7 comparison to the current TCR shows a cost savings for most households. For those households
8 that are expected to see a cost increase, the average monthly water bill would be expected to
9 increase by a penny or less on average. Although this average cost per household is very low,
10 customers served by PWSs that incur greater costs to comply with the proposed RTCR would be
11 higher.
12

13 The subsequent sections of the exhibit present net costs per household for different
14 subsections of CWSs (e.g., CWSs that perform assessments but no corrective actions, CWSs that
15 do perform corrective actions, and CWSs that do not perform assessments or corrective actions).
16 As shown in the second section of Exhibit 7.23, approximately 75% of households belong to
17 CWSs that would perform assessments but would not perform corrective actions. These
18 households would experience a slight cost savings on an annual basis. The 8% of households
19 belonging to CWSs that would perform corrective actions would experience an increase in
20 annual net household costs of \$107-\$124 on an annual basis, or approximately \$10 per month on
21 average. The final section of the exhibit presents the 16% of households belonging to CWSs that
22 would not perform assessments or corrective actions. These households would experience a
23 slight cost savings on an annual basis, comparable to those performing assessments but no
24 corrective actions. Overall, the main driver of additional household costs under the RTCR is
25 whether or not additional corrective actions are performed.
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Exhibit 7.23 Summary of Annual Per-Household Costs for the Proposed RTCR (2007\$)

| PWS Size (Population Served) | Number of Households (AIP) | Number of Households (Alternative Analysis) | 3% Discount Rate | | | | 7% Discount Rate | | | |
|--|----------------------------|---|-----------------------|----------------------------|--------------------------|---|---------------------|----------------------------|--------------------------|---|
| | | | AIP Net | AIP Net Cost per Household | Alternative Analysis Net | Alternative Analysis Net Cost per Household | AIP Net | AIP Net Cost per Household | Alternative Analysis Net | Alternative Analysis Net Cost per Household |
| | | | C | D=C/A | E | F=E/B | G | H=G/A | I | J=I/B |
| All Community Water Systems (CWSs) | | | | | | | | | | |
| ≤500 | 1,896,753 | 1,896,753 | \$ 214,316 | \$ 0.11 | \$ 417,834 | \$ 0.22 | \$ 231,408 | \$ 0.12 | \$ 492,854 | \$ 0.26 |
| 501-1,000 | 1,624,853 | 1,624,853 | \$ (22,006) | \$ (0.01) | \$ 19,473 | \$ 0.01 | \$ (8,064) | \$ (0.00) | \$ 45,220 | \$ 0.03 |
| 1,001-4,100 | 7,816,592 | 7,816,592 | \$ 260,949 | \$ 0.03 | \$ 260,949 | \$ 0.03 | \$ 243,698 | \$ 0.03 | \$ 243,698 | \$ 0.03 |
| 4,101-33,000 | 27,997,647 | 27,997,647 | \$ 2,266,835 | \$ 0.08 | \$ 2,266,835 | \$ 0.08 | \$ 1,912,663 | \$ 0.07 | \$ 1,912,663 | \$ 0.07 |
| 33,001-96,000 | 21,933,438 | 21,933,438 | \$ (193,190) | \$ (0.01) | \$ (193,190) | \$ (0.01) | \$ (173,163) | \$ (0.01) | \$ (173,163) | \$ (0.01) |
| 96,001-500,000 | 26,770,609 | 26,770,609 | \$ (161,889) | \$ (0.01) | \$ (161,889) | \$ (0.01) | \$ (149,842) | \$ (0.01) | \$ (149,842) | \$ (0.01) |
| 500,001-1 Million | 9,764,979 | 9,764,979 | \$ (2,046) | \$ (0.00) | \$ (2,046) | \$ (0.00) | \$ (1,305) | \$ (0.00) | \$ (1,305) | \$ (0.00) |
| > 1 Million | 16,309,853 | 16,309,853 | \$ (99,759) | \$ (0.01) | \$ (99,759) | \$ (0.01) | \$ (95,421) | \$ (0.01) | \$ (95,421) | \$ (0.01) |
| Total | 114,114,724 | 114,114,724 | \$ 2,263,210 | \$ 0.19 | \$ 2,508,206 | \$ 0.33 | \$ 1,959,974 | \$ 0.20 | \$ 2,274,704 | \$ 0.37 |
| Community Water Systems (CWSs) performing Level 1/Level 2 Assessments (and no Corrective Actions) | | | | | | | | | | |
| ≤500 | 455,377 | 455,377 | \$ (178,158) | \$ (0.39) | \$ (130,882.84) | \$ (0.29) | \$ (145,494) | \$ (0.32) | \$ (84,756) | \$ (0.19) |
| 501-1,000 | 326,440 | 326,440 | \$ (40,851) | \$ (0.13) | \$ (32,708.25) | \$ (0.10) | \$ (33,055) | \$ (0.10) | \$ (22,594) | \$ (0.07) |
| 1,001-4,100 | 1,892,780 | 1,892,780 | \$ (74,258) | \$ (0.04) | \$ (74,258.09) | \$ (0.04) | \$ (58,872) | \$ (0.03) | \$ (58,872) | \$ (0.03) |
| 4,101-33,000 | 24,524,727 | 24,524,727 | \$ (308,463) | \$ (0.01) | \$ (308,462.80) | \$ (0.01) | \$ (246,810) | \$ (0.01) | \$ (246,810) | \$ (0.01) |
| 33,001-96,000 | 17,768,356 | 17,768,356 | \$ (156,504) | \$ (0.01) | \$ (156,504.29) | \$ (0.01) | \$ (140,280) | \$ (0.01) | \$ (140,280) | \$ (0.01) |
| 96,001-500,000 | 19,671,624 | 19,671,624 | \$ (118,960) | \$ (0.01) | \$ (118,959.67) | \$ (0.01) | \$ (110,107) | \$ (0.01) | \$ (110,107) | \$ (0.01) |
| 500,001-1 Million | 5,524,188 | 5,524,188 | \$ (1,157) | \$ (0.00) | \$ (1,157.43) | \$ (0.00) | \$ (738) | \$ (0.00) | \$ (738) | \$ (0.00) |
| > 1 Million | 16,146,754 | 16,146,754 | \$ (98,761) | \$ (0.01) | \$ (98,761.46) | \$ (0.01) | \$ (94,466) | \$ (0.01) | \$ (94,466) | \$ (0.01) |
| Total | 86,310,246 | 86,310,246 | \$ (977,112) | \$ (0.59) | \$ (921,695) | \$ (0.46) | \$ (829,823) | \$ (0.48) | \$ (758,625) | \$ (0.32) |
| Community Water Systems (CWSs) performing Corrective Actions | | | | | | | | | | |
| ≤500 | 11,693 | 11,693 | \$ 951,811 | \$ 81.40 | \$ 959,631.08 | \$ 82.07 | \$ 833,688 | \$ 71.30 | \$ 843,707 | \$ 72.16 |
| 501-1,000 | 6,828 | 6,828 | \$ 180,475 | \$ 26.43 | \$ 181,594.29 | \$ 26.60 | \$ 155,778 | \$ 22.82 | \$ 157,211 | \$ 23.02 |
| 1,001-4,100 | 37,496 | 37,496 | \$ 566,141 | \$ 15.10 | \$ 566,140.89 | \$ 15.10 | \$ 485,656 | \$ 12.95 | \$ 485,656 | \$ 12.95 |
| 4,101-33,000 | 2,724,970 | 2,724,970 | \$ 2,584,705 | \$ 0.95 | \$ 2,584,705.16 | \$ 0.95 | \$ 2,167,000 | \$ 0.80 | \$ 2,167,000 | \$ 0.80 |
| 33,001-96,000 | 1,974,262 | 1,974,262 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| 96,001-500,000 | 2,185,736 | 2,185,736 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| 500,001-1 Million | 613,799 | 613,799 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| > 1 Million | 1,794,084 | 1,794,084 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Total | 9,348,866 | 9,348,866 | \$ 4,283,132 | \$ 123.88 | \$ 4,292,071 | \$ 124.71 | \$ 3,642,122 | \$ 107.86 | \$ 3,653,574 | \$ 108.93 |
| Community Water Systems (CWSs) not performing Level 1/Level 2 Assessments, or Corrective Actions | | | | | | | | | | |
| ≤500 | 1,429,683 | 1,429,683 | \$ (559,337) | \$ (0.39) | \$ (410,915) | \$ (0.29) | \$ (456,786) | \$ (0.32) | \$ (266,097) | \$ (0.19) |
| 501-1,000 | 1,291,585 | 1,291,585 | \$ (161,630) | \$ (0.13) | \$ (129,413) | \$ (0.10) | \$ (130,787) | \$ (0.10) | \$ (89,397) | \$ (0.07) |
| 1,001-4,100 | 5,886,316 | 5,886,316 | \$ (230,934) | \$ (0.04) | \$ (230,934) | \$ (0.04) | \$ (183,086) | \$ (0.03) | \$ (183,086) | \$ (0.03) |
| 4,101-33,000 | 747,950 | 747,950 | \$ (9,407) | \$ (0.01) | \$ (9,407) | \$ (0.01) | \$ (7,527) | \$ (0.01) | \$ (7,527) | \$ (0.01) |
| 33,001-96,000 | 2,190,820 | 2,190,820 | \$ (36,686) | \$ (0.02) | \$ (36,686) | \$ (0.02) | \$ (32,883) | \$ (0.02) | \$ (32,883) | \$ (0.02) |
| 96,001-500,000 | 4,913,249 | 4,913,249 | \$ (42,929) | \$ (0.01) | \$ (42,929) | \$ (0.01) | \$ (39,735) | \$ (0.01) | \$ (39,735) | \$ (0.01) |
| 500,001-1 Million | 3,626,992 | 3,626,992 | \$ (889) | \$ (0.00) | \$ (889) | \$ (0.00) | \$ (567) | \$ (0.00) | \$ (567) | \$ (0.00) |
| > 1 Million | (1,630,985) | (1,630,985) | \$ (998) | \$ 0.00 | \$ (998) | \$ 0.00 | \$ (954) | \$ 0.00 | \$ (954) | \$ 0.00 |
| Total | 18,455,611 | 18,455,611 | \$ (1,042,810) | \$ (0.59) | \$ (862,170) | \$ (0.46) | \$ (852,325) | \$ (0.48) | \$ (620,246) | \$ (0.32) |

(C), (E), (G), (I) Exhibit 7.28.

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2 **7.6 Nonquantified Costs**
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4 EPA believes that all of the rule elements that are the major drivers of the net changes in
5 costs the current TCR have been quantified to the greatest degree possible. However, several
6 items are not specifically accounted for in the cost analysis, and their exclusion from
7 consideration may result in an overestimate of net change in cost between the TCR and the AIP
8 or Alternative Analysis.
9

10 Under the Alternative Analysis, PWSs are required to sample no less than quarterly and
11 under that requirement may elect to forgo annual site inspections (especially in cases where the
12 state performs or subsidizes the additional monitoring for PWSs that were previously monitoring
13 annually) since they would not be required. However, due to a lack of data on the potential for
14 discontinuing annual site visits under the Alternative Analysis, the proposed RTCR Cost Model
15 does not calculate the potential cost reductions for discontinuing site inspections under the
16 Alternative Analysis. This leads to a potential overestimate of costs for the Alternative Analysis
17 (i.e., a cost savings may be realized for some states).
18

19 In some instances, the performance of an assessment (especially a Level 2 assessment)
20 may overlap with a scheduled sanitary survey. To the extent that the requirements for
21 performing a sanitary survey may be satisfied as part of the assessment process, PWSs and states
22 may realize a cost savings compared to performing a separate sanitary survey. This potential for
23 indirect cost savings is not captured in the cost model, resulting in a potential overestimate of
24 costs stemming from proposed RTCR implementation.
25

26 Under the TCR, AIP, and Alternative Analysis, Tier 3 public notification for monitoring
27 and reporting violations are assumed to be reported once per year as part of the Consumer
28 Confidence Report (CCR). Because of the use of the CCR to communicate Tier 3 public
29 notification on a yearly basis, no cost differential between the current TCR and the AIP and
30 Alternative Analysis is estimated in the cost model. However, although they are not
31 quantitatively evaluated as part of the EA, the TCRDSAC concluded that significant reductions
32 in monitoring and reporting violations may be realized through the revised regulatory framework
33 of the proposed RTCR. Resources used to process monitoring violation notices for the CCR (as
34 well as the time spent responding to customer inquiries about the notices) may be reduced if
35 significant reductions are realized. Exclusion of this potential cost savings may lead to an
36 underestimate of the PN cost savings under both the AIP and Alternative Analysis.
37

38 In each of the three cases described above, the omission in the costing model leads to an
39 overestimate of potential costs, resulting in conservative estimates of the net cost changes from
40 the current TCR.
41

42 Additionally, as an underlying assumption to the costing methodology, EPA has assumed
43 that all PWSs subject to the proposed RTCR requirements are already complying with the
44 current TCR. There may be some PWSs that are not in full compliance with the current TCR,
45 and if so, additional costs would be incurred.
46

7.7 Uncertainty Analysis

There are two primary sources of uncertainty in proposed RTCR cost modeling. The first is related to the underlying estimates of events resulting from the rule revisions as generated from the predictive occurrence model. The predictive occurrence model (discussed in detail in Chapter 5) does not explicitly consider uncertainty, and therefore does not generate “confidence intervals” on the predicted outcomes. However, the Agency evaluated the model inputs to determine which of the inputs were likely to have a significant effect on the results and subjected those to further review through of sensitivity analyses. In particular, EPA evaluated the impacts of alternative estimates of the net change percentage of PWSs predicted to take corrective actions in response to an assessment (10% in the model) and the associated effectiveness of those corrective actions (section 5.3.3.1 discusses these analyses in detail). The results of these analyses suggest that changes in the major assumptions about the net change percentage of corrective actions identified and the effectiveness of those actions have a less than linear effect on predicted outcomes. When applied to costs estimates they would have even less impact.

In the case where PWSs increase the percentage of corrective actions taken in response to an assessment, costs are expected to increase corresponding to the greater number of corrective actions taken. Using the increases predicted for the small subset of PWSs analyzed in the analysis, it is estimated that corrective action costs would increase by 86% for Level 1 corrective actions and 31% for Level 2 corrective actions. This is in response to a doubling of the net change percentage of corrective actions taken in response to an assessment. However, the increased effectiveness of more corrective actions has a dampening effect on other costs that would offset the increased corrective action costs. For instance, although the numbers of corrective actions increase due to the higher percentages found during assessments, the actual number of assessments decrease (-9% Level 1 and -37% Level 2) because less positive samples (ranging from -6% routine TC+ to -34% repeat EC+) are predicted to be found. The overall effect of the offsetting cost increases and decreases in response to the major predictive occurrence model uncertainties is expected to be minimal.

The other major area of uncertainty that may affect the resulting cost calculations is the distribution of corrective actions taken by PWSs (the compliance forecast) in response to finding a problem during a Level 1 or Level 2 Assessment. The compliance forecast presented in Exhibit 7.16 represents EPA’s best estimate of a distribution of corrective actions that may be taken by PWSs to respond to problems identified under the proposed RTCR. Because there is a wide variation in the unit costs of the actual corrective actions underlying the compliance forecast (see Appendix D for unit cost detail), EPA ran two sensitivity analyses to assess the potential impacts of different distributions within the compliance forecast. These two sensitivity runs attempt to bound the analysis of corrective action costs by generating a low and high cost bound to the estimates.

Low Bound Estimate

During discussions in the TCRDSAC meetings, several stakeholders suggested that almost all additional corrective actions taken in response to the proposed RTCR would be in response to transient contamination events or poor sampling techniques. These are also the least expensive corrective actions. To examine the effects of greater emphasis on these types of corrective actions, EPA reran the cost model to reflect 90% selection of either spot flushing or sampler training as corrective actions. The remaining 10% of costs were distributed across the

1 least costly corrective actions under each of the other compliance forecast categories. This
 2 results in an approximate 95 percent decrease in total net costs for the AIP and an approximate
 3 44 percent decrease in total net costs for the Alternative Analysis. Exhibit 7.24 shows the
 4 change in the overall costs with this change.

5
 6 *High Bound Estimate*

7
 8 PWSs may also take actions that result in higher corrective action costs than those
 9 predicted by the current compliance forecast, although this would be a less likely scenario based
 10 on stakeholder discussions. Purely economic considerations also suggest that, given the option,
 11 PWSs would opt for the least costly option to address any issues identified. However, to test a
 12 potential high end of corrective action costs, EPA ran the cost model with the compliance
 13 forecast set to take the highest cost corrective action in each compliance forecast category. In
 14 this scenario, only 5% of corrective actions were predicted for flushing and sampler training, and
 15 10% were estimated for each of the other compliance categories, and unit costs were assigned for
 16 the highest unit cost corrective action in each. This results in an increase in total net costs for the
 17 AIP by approximately a factor of two, and an increase in total net costs by approximately a factor
 18 of 1.5 for the Alternative Analysis. Exhibit 7.24 shows the annualized total and net change cost
 19 estimates for PWSs and states to comply with proposed RTCR under the TCR, AIP, and
 20 Alternative Analysis based on low bound and high bound estimates in the compliance forecast.

21
 22
 23 **Exhibit 7.24 Sensitivity Analysis – Annualized Net Change in Costs based on**
 24 **Changes in Compliance Forecast (\$Millions, 2007\$)**
 25

| | PWSs | | | State | | | Total | | | | | |
|---|------------------|---------|----------|----------|---------|----------|------------------|---------|----------|--|--|--|
| | 3% Discount Rate | | | | | | 7% Discount Rate | | | | | |
| | PWSs | State | Total | PWSs | State | Total | PWSs | State | Total | | | |
| AIP Net Change | \$ 9.42 | \$ 0.49 | \$ 9.91 | \$ 8.62 | \$ 0.73 | \$ 9.36 | \$ 8.62 | \$ 0.73 | \$ 9.36 | | | |
| AIP Low Bound Net Change | \$ 0.48 | \$ 0.49 | \$ 0.96 | \$ 0.94 | \$ 0.73 | \$ 1.67 | \$ 0.94 | \$ 0.73 | \$ 1.67 | | | |
| AIP High Bound Net Change | \$ 19.05 | \$ 0.49 | \$ 19.54 | \$ 17.42 | \$ 0.73 | \$ 18.15 | \$ 17.42 | \$ 0.73 | \$ 18.15 | | | |
| Alternative Analysis Net Change | \$ 25.72 | \$ 0.79 | \$ 26.51 | \$ 27.07 | \$ 1.08 | \$ 28.15 | \$ 27.07 | \$ 1.08 | \$ 28.15 | | | |
| Alternative Analysis Low Bound Net Change | \$ 15.32 | \$ 0.79 | \$ 16.10 | \$ 17.85 | \$ 1.08 | \$ 18.93 | \$ 17.85 | \$ 1.08 | \$ 18.93 | | | |
| Alternative Analysis High Bound Net Change | \$ 38.01 | \$ 0.79 | \$ 38.80 | \$ 38.70 | \$ 1.08 | \$ 39.77 | \$ 38.70 | \$ 1.08 | \$ 39.77 | | | |

26 Note: Detail may not add due to independent rounding.
 27 Source: Proposed RTCR Cost Model.

28 Overall, EPA recognizes that there is uncertainty in various parts of its estimates that
 29 could result in either an over- or underestimate of the costs as presented in this chapter. The
 30 Agency has been careful to use the best available data, to account for uncertainty quantitatively
 31 when possible, and to avoid any consistent biases in assumptions and the use of data.

32
 33
 34 **7.8 Comparison of Total and Net Annualized Costs for All Regulatory Alternatives**

35
 36 Based on information presented previously in this chapter, EPA developed national cost
 37 estimates for the TCR, AIP, and Alternative Analysis. Exhibit 7.25 presents the total and net
 38 change in annualized costs to PWSs and states at 3 and 7 percent discount rates. Exhibit 7.26
 39 presents the total and net change in annualized costs for the TCR, AIP, and Alternative Analysis
 40 by rule component at 3 and 7 percent discount rates. Exhibit 7.27 presents the total and net
 41 change in annualized costs for the TCR, AIP, and Alternative Analysis by PWS size and type at

1 3 and 7 percent discount rates. Exhibit 7.28 presents the costs shown in Exhibit 7.27 on a per-
 2 PWS basis. Further discussion of the results follows these exhibits.

3
 4
 5 **Exhibit 7.25 Comparison of Total and Net Change in Annualized Present Value**
 6 **Costs (\$Millions, 2007\$)**
 7

| | PWSs | State | Total | PWSs | State | Total |
|--|--------------------|-----------|-----------|------------------|-----------|-----------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| | TCR - Total | \$ 184.70 | \$ 0.87 | \$ 185.57 | \$ 177.50 | \$ 0.83 |
| AIP - Total | \$ 194.12 | \$ 1.35 | \$ 195.47 | \$ 186.13 | \$ 1.57 | \$ 187.69 |
| AIP - Net Change | \$ 9.42 | \$ 0.49 | \$ 9.91 | \$ 8.62 | \$ 0.73 | \$ 9.36 |
| AIP - Percent Change | 5% | 57% | 5% | 5% | 88% | 5% |
| Alternative Analysis - Total | \$ 210.42 | \$ 1.65 | \$ 212.08 | \$ 204.58 | \$ 1.91 | \$ 206.48 |
| Alternative Analysis - Net Change | \$ 25.72 | \$ 0.79 | \$ 26.51 | \$ 27.07 | \$ 1.08 | \$ 28.15 |
| Alternative Analysis - Percent Change | 14% | 91% | 14% | 15% | 129% | 16% |

Note: Detail may not add due to independent rounding.
 Source: Proposed RTCR Cost Model.

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Exhibit 7.26 Comparison of Total and Net Change in Annualized Present Value Costs by Rule Component (\$Millions, 2007\$)

| | PWSs | State | Total | PWSs | State | Total |
|--|------------------|-----------|-----------|------------------|-----------|-----------|
| | 3% Discount Rate | | | 7% Discount Rate | | |
| Rule Implementation | | | | | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |
| AIP - Net Change | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |
| Alternative Analysis - Total | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |
| Alternative Analysis - Net Change | \$ 0.63 | \$ 0.18 | \$ 0.81 | \$ 0.90 | \$ 0.26 | \$ 1.16 |
| Revising Sampling Plans | | | | | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |
| AIP - Net Change | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |
| Alternative Analysis - Total | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |
| Alternative Analysis - Net Change | \$ 0.59 | \$ 0.42 | \$ 1.01 | \$ 0.84 | \$ 0.59 | \$ 1.42 |
| Routine Monitoring | | | | | | |
| TCR - Total | \$ 170.60 | \$ - | \$ 170.60 | \$ 163.94 | \$ - | \$ 163.94 |
| AIP - Total | \$ 174.34 | \$ - | \$ 174.34 | \$ 167.43 | \$ - | \$ 167.43 |
| AIP - Net Change | \$ 3.75 | \$ - | \$ 3.75 | \$ 3.48 | \$ - | \$ 3.48 |
| Alternative Analysis - Total | \$ 187.61 | \$ - | \$ 187.61 | \$ 182.57 | \$ - | \$ 182.57 |
| Alternative Analysis - Net Change | \$ 17.01 | \$ - | \$ 17.01 | \$ 18.62 | \$ - | \$ 18.62 |
| Additional Routine Monitoring | | | | | | |
| TCR - Total | \$ 3.87 | \$ - | \$ 3.87 | \$ 3.72 | \$ - | \$ 3.72 |
| AIP - Total | \$ 1.14 | \$ - | \$ 1.14 | \$ 1.11 | \$ - | \$ 1.11 |
| AIP - Net Change | \$ (2.72) | \$ - | \$ (2.72) | \$ (2.61) | \$ - | \$ (2.61) |
| Alternative Analysis - Total | \$ 0.78 | \$ - | \$ 0.78 | \$ 0.66 | \$ - | \$ 0.66 |
| Alternative Analysis - Net Change | \$ (3.08) | \$ - | \$ (3.08) | \$ (3.05) | \$ - | \$ (3.05) |
| Repeat Monitoring | | | | | | |
| TCR - Total | \$ 5.07 | \$ - | \$ 5.07 | \$ 4.87 | \$ - | \$ 4.87 |
| AIP - Total | \$ 4.65 | \$ - | \$ 4.65 | \$ 4.47 | \$ - | \$ 4.47 |
| AIP - Net Change | \$ (0.42) | \$ - | \$ (0.42) | \$ (0.40) | \$ - | \$ (0.40) |
| Alternative Analysis - Total | \$ 5.40 | \$ - | \$ 5.40 | \$ 5.33 | \$ - | \$ 5.33 |
| Alternative Analysis - Net Change | \$ 0.33 | \$ - | \$ 0.33 | \$ 0.46 | \$ - | \$ 0.46 |
| Site Inspections | | | | | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Net Change | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Alternative Analysis - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Alternative Analysis - Net Change | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Level 1 Assessment | | | | | | |
| TCR - Total | \$ 1.03 | \$ 0.20 | \$ 1.24 | \$ 0.99 | \$ 0.19 | \$ 1.19 |
| AIP - Total | \$ 1.52 | \$ 0.19 | \$ 1.71 | \$ 1.46 | \$ 0.19 | \$ 1.65 |
| AIP - Net Change | \$ 0.49 | \$ (0.01) | \$ 0.48 | \$ 0.47 | \$ (0.01) | \$ 0.46 |
| Alternative Analysis - Total | \$ 1.67 | \$ 0.23 | \$ 1.90 | \$ 1.63 | \$ 0.22 | \$ 1.85 |
| Alternative Analysis - Net Change | \$ 0.64 | \$ 0.03 | \$ 0.66 | \$ 0.64 | \$ 0.03 | \$ 0.67 |
| Level 2 Assessment | | | | | | |
| TCR - Total | \$ 0.63 | \$ 0.24 | \$ 0.87 | \$ 0.61 | \$ 0.23 | \$ 0.84 |
| AIP - Total | \$ 0.81 | \$ 0.17 | \$ 0.99 | \$ 0.79 | \$ 0.17 | \$ 0.96 |
| AIP - Net Change | \$ 0.18 | \$ (0.07) | \$ 0.11 | \$ 0.19 | \$ (0.06) | \$ 0.12 |
| Alternative Analysis - Total | \$ 1.12 | \$ 0.26 | \$ 1.39 | \$ 1.15 | \$ 0.27 | \$ 1.43 |
| Alternative Analysis - Net Change | \$ 0.49 | \$ 0.02 | \$ 0.51 | \$ 0.55 | \$ 0.04 | \$ 0.59 |
| Corrective Actions based on Level 1 Assessments | | | | | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 6.80 | \$ 0.09 | \$ 6.89 | \$ 5.80 | \$ 0.08 | \$ 5.88 |
| AIP - Net Change | \$ 6.80 | \$ 0.09 | \$ 6.89 | \$ 5.80 | \$ 0.08 | \$ 5.88 |
| Alternative Analysis - Total | \$ 7.37 | \$ 0.10 | \$ 7.47 | \$ 6.36 | \$ 0.09 | \$ 6.45 |
| Alternative Analysis - Net Change | \$ 7.37 | \$ 0.10 | \$ 7.47 | \$ 6.36 | \$ 0.09 | \$ 6.45 |
| Corrective Actions based on Level 2 Assessments | | | | | | |
| TCR - Total | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| AIP - Total | \$ 2.57 | \$ 0.05 | \$ 2.62 | \$ 2.29 | \$ 0.04 | \$ 2.33 |
| AIP - Net Change | \$ 2.57 | \$ 0.05 | \$ 2.62 | \$ 2.29 | \$ 0.04 | \$ 2.33 |
| Alternative Analysis - Total | \$ 3.59 | \$ 0.06 | \$ 3.65 | \$ 3.40 | \$ 0.05 | \$ 3.45 |
| Alternative Analysis - Net Change | \$ 3.59 | \$ 0.06 | \$ 3.65 | \$ 3.40 | \$ 0.05 | \$ 3.45 |
| Public Notification | | | | | | |
| TCR - Total | \$ 3.51 | \$ 0.42 | \$ 3.93 | \$ 3.37 | \$ 0.41 | \$ 3.78 |
| AIP - Total | \$ 1.06 | \$ 0.26 | \$ 1.32 | \$ 1.03 | \$ 0.25 | \$ 1.28 |
| AIP - Net Change | \$ (2.45) | \$ (0.17) | \$ (2.61) | \$ (2.34) | \$ (0.16) | \$ (2.49) |
| Alternative Analysis - Total | \$ 1.66 | \$ 0.40 | \$ 2.06 | \$ 1.73 | \$ 0.42 | \$ 2.15 |
| Alternative Analysis - Net Change | \$ (1.85) | \$ (0.02) | \$ (1.87) | \$ (1.64) | \$ 0.01 | \$ (1.62) |

Note:

1) Detail may not add due to independent rounding.

2) For modeling purposes, additional routine sample counts include regular routine samples taking in the same month.

Source: Proposed RTCR Cost Model.

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Exhibit 7.27 Total and Net Change in Annualized Costs to PWSs by PWS Size and Type (2007\$)

| PWS Size (Population Served) | 3% Discount Rate | | | | | 7% Discount Rate | | | | |
|---|----------------------|----------------------|--------------------|------------------------------|----------------------------|----------------------|----------------------|--------------------|------------------------------|----------------------------|
| | TCR - Total | AIP - Total | AIP - Net | Alternative Analysis - Total | Alternative Analysis - Net | TCR - Total | AIP - Total | AIP - Net | Alternative Analysis - Total | Alternative Analysis - Net |
| | A | B | C=B-A | D | E=D-A | F | G | H=G-F | I | J=I-F |
| Community Water Systems (CWSs) | | | | | | | | | | |
| ≤500 | \$16,360,901 | \$16,575,217 | \$214,316 | \$16,778,735 | \$417,834 | \$15,722,611 | \$15,954,019 | \$231,408 | \$16,215,466 | \$492,854 |
| 501-1,000 | \$3,718,045 | \$3,696,040 | (\$22,006) | \$3,737,519 | \$19,473 | \$3,572,543 | \$3,564,479 | (\$8,064) | \$3,617,763 | \$45,220 |
| 1,001-4,100 | \$13,113,245 | \$13,374,194 | \$260,949 | \$13,374,194 | \$260,949 | \$12,603,971 | \$12,847,669 | \$243,698 | \$12,847,669 | \$243,698 |
| 4,101-33,000 | \$42,250,817 | \$44,517,652 | \$2,266,835 | \$44,517,652 | \$2,266,835 | \$40,603,231 | \$42,515,893 | \$1,912,663 | \$42,515,893 | \$1,912,663 |
| 33,001-96,000 | \$34,768,152 | \$34,574,962 | (\$193,190) | \$34,574,962 | (\$193,190) | \$33,412,202 | \$33,239,039 | (\$173,163) | \$33,239,039 | (\$173,163) |
| 96,001-500,000 | \$34,667,600 | \$34,505,710 | (\$161,889) | \$34,505,710 | (\$161,889) | \$33,315,427 | \$33,165,585 | (\$149,842) | \$33,165,585 | (\$149,842) |
| 500,001-1 Million | \$6,456,987 | \$6,454,941 | (\$2,046) | \$6,454,941 | (\$2,046) | \$6,205,130 | \$6,203,825 | (\$1,305) | \$6,203,825 | (\$1,305) |
| > 1 Million | \$5,652,731 | \$5,552,972 | (\$99,759) | \$5,552,972 | (\$99,759) | \$5,432,249 | \$5,336,829 | (\$95,421) | \$5,336,829 | (\$95,421) |
| Total | \$156,988,478 | \$159,251,688 | \$2,263,210 | \$159,496,685 | \$2,508,206 | \$150,867,365 | \$152,827,340 | \$1,959,974 | \$153,142,069 | \$2,274,704 |
| Nontransient Noncommunity Water Systems (NTNCWSs) | | | | | | | | | | |
| ≤500 | \$4,422,908 | \$4,541,630 | \$118,722 | \$6,385,745 | \$1,962,838 | \$4,251,576 | \$4,422,531 | \$170,955 | \$6,560,716 | \$2,309,140 |
| 501-1,000 | \$576,664 | \$592,963 | \$16,299 | \$805,246 | \$228,582 | \$554,199 | \$581,297 | \$27,098 | \$832,777 | \$278,578 |
| 1,001-4,100 | \$1,157,912 | \$1,233,503 | \$75,591 | \$1,233,503 | \$75,591 | \$1,112,819 | \$1,180,077 | \$67,258 | \$1,180,077 | \$67,258 |
| 4,101-33,000 | \$444,442 | \$511,041 | \$66,599 | \$511,041 | \$66,599 | \$427,119 | \$483,565 | \$56,446 | \$483,565 | \$56,446 |
| 33,001-96,000 | \$127,987 | \$127,379 | (\$608) | \$127,379 | (\$608) | \$122,998 | \$122,468 | (\$531) | \$122,468 | (\$531) |
| 96,001-500,000 | \$91,171 | \$90,786 | (\$385) | \$90,786 | (\$385) | \$87,617 | \$87,267 | (\$351) | \$87,267 | (\$351) |
| 500,001-1 Million | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| > 1 Million | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total | \$6,821,084 | \$7,097,301 | \$276,217 | \$9,153,701 | \$2,332,617 | \$6,556,329 | \$6,877,205 | \$320,876 | \$9,266,870 | \$2,710,541 |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | | | | |
| ≤500 | \$18,271,209 | \$24,803,967 | \$6,532,758 | \$38,483,165 | \$20,211,956 | \$17,561,118 | \$23,590,510 | \$6,029,393 | \$38,961,785 | \$21,400,667 |
| 501-1,000 | \$635,866 | \$800,945 | \$165,079 | \$1,123,913 | \$488,047 | \$611,207 | \$765,224 | \$154,017 | \$1,139,920 | \$528,713 |
| 1,001-4,100 | \$927,812 | \$1,055,052 | \$127,240 | \$1,055,052 | \$127,240 | \$891,980 | \$1,002,359 | \$110,379 | \$1,002,359 | \$110,379 |
| 4,101-33,000 | \$428,827 | \$471,924 | \$43,098 | \$471,924 | \$43,098 | \$412,117 | \$449,289 | \$37,172 | \$449,289 | \$37,172 |
| 33,001-96,000 | \$76,979 | \$76,191 | (\$789) | \$76,191 | (\$789) | \$73,981 | \$73,266 | (\$715) | \$73,266 | (\$715) |
| 96,001-500,000 | \$77,755 | \$76,940 | (\$816) | \$76,940 | (\$816) | \$74,726 | \$73,978 | (\$748) | \$73,978 | (\$748) |
| 500,001-1 Million | \$186,613 | \$184,622 | (\$1,991) | \$184,622 | (\$1,991) | \$179,343 | \$177,500 | (\$1,843) | \$177,500 | (\$1,843) |
| > 1 Million | \$287,010 | \$301,503 | \$14,493 | \$301,503 | \$14,493 | \$275,817 | \$289,852 | \$14,035 | \$289,852 | \$14,035 |
| Total | \$20,892,071 | \$27,771,144 | \$6,879,073 | \$41,773,310 | \$20,881,238 | \$20,080,289 | \$26,421,977 | \$6,341,689 | \$42,167,947 | \$22,087,659 |
| Grand Total | \$184,701,634 | \$194,120,134 | \$9,418,500 | \$210,423,695 | \$25,722,062 | \$177,503,983 | \$186,126,522 | \$8,622,539 | \$204,576,886 | \$27,072,903 |

Note: Detail may not add due to independent rounding.

Source: Proposed RTCR Cost Model.

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Exhibit 7.28 Total and Net Change in Annualized Per PWS Costs by PWS Size and Type (2007\$)

| PWS Size (Population Served) | 3% Discount Rate | | | | | 7% Discount Rate | | | | |
|---|--------------------|--------------------|------------------|------------------------------------|----------------------------------|--------------------|--------------------|------------------|------------------------------------|----------------------------------|
| | TCR - Total | AIP - Total | AIP - Net | Alternative Analysis - Total | Alternative Analysis - Net | TCR - Total | AIP - Total | AIP - Net | Alternative Analysis - Total | Alternative Analysis - Net |
| | A | B | C=B-A | D | E=D-A | F | G | H=G-F | I | J=I-F |
| Community Water Systems (CWSs) | | | | | | | | | | |
| ≤500 | \$561 | \$569 | \$7 | \$576 | \$14 | \$539 | \$547 | \$8 | \$556 | \$17 |
| 501-1,000 | \$659 | \$655 | (\$4) | \$663 | \$3 | \$633 | \$632 | (\$1) | \$641 | \$8 |
| 1,001-4,100 | \$1,398 | \$1,426 | \$28 | \$1,426 | \$28 | \$1,344 | \$1,370 | \$26 | \$1,370 | \$26 |
| 4,101-33,000 | \$6,685 | \$7,044 | \$359 | \$7,044 | \$359 | \$6,425 | \$6,727 | \$303 | \$6,727 | \$303 |
| 33,001-96,000 | \$32,956 | \$32,772 | (\$183) | \$32,772 | (\$183) | \$31,670 | \$31,506 | (\$164) | \$31,506 | (\$164) |
| 96,001-500,000 | \$93,444 | \$93,007 | (\$436) | \$93,007 | (\$436) | \$89,799 | \$89,395 | (\$404) | \$89,395 | (\$404) |
| 500,001-1 Million | \$184,485 | \$184,427 | (\$58) | \$184,427 | (\$58) | \$177,289 | \$177,252 | (\$37) | \$177,252 | (\$37) |
| > 1 Million | \$282,637 | \$277,649 | (\$4,988) | \$277,649 | (\$4,988) | \$271,612 | \$266,841 | (\$4,771) | \$266,841 | (\$4,771) |
| Total | \$602,825 | \$597,549 | (\$5,276) | \$597,563 | (\$5,262) | \$579,312 | \$574,271 | (\$5,041) | \$574,289 | (\$5,023) |
| Nontransient Noncommunity Water Systems (NTNCWSs) | | | | | | | | | | |
| ≤500 | \$277 | \$285 | \$7 | \$401 | \$123 | \$267 | \$277 | \$11 | \$412 | \$145 |
| 501-1,000 | \$319 | \$328 | \$9 | \$446 | \$127 | \$307 | \$322 | \$15 | \$461 | \$154 |
| 1,001-4,100 | \$1,310 | \$1,395 | \$86 | \$1,395 | \$86 | \$1,259 | \$1,335 | \$76 | \$1,335 | \$76 |
| 4,101-33,000 | \$4,831 | \$5,555 | \$724 | \$5,555 | \$724 | \$4,643 | \$5,256 | \$614 | \$5,256 | \$614 |
| 33,001-96,000 | \$31,997 | \$31,845 | (\$152) | \$31,845 | (\$152) | \$30,750 | \$30,617 | (\$133) | \$30,617 | (\$133) |
| 96,001-500,000 | \$91,171 | \$90,786 | (\$385) | \$90,786 | (\$385) | \$87,617 | \$87,267 | (\$351) | \$87,267 | (\$351) |
| 500,001-1 Million | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| > 1 Million | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total | \$129,905 | \$130,194 | \$288 | \$130,427 | \$522 | \$124,842 | \$125,074 | \$232 | \$125,347 | \$505 |
| Transient Noncommunity Water Systems (TNCWSs) - GW | | | | | | | | | | |
| ≤500 | \$225 | \$305 | \$80 | \$473 | \$249 | \$216 | \$290 | \$74 | \$479 | \$263 |
| 501-1,000 | \$310 | \$391 | \$80 | \$548 | \$238 | \$298 | \$373 | \$75 | \$556 | \$258 |
| 1,001-4,100 | \$1,356 | \$1,542 | \$186 | \$1,542 | \$186 | \$1,304 | \$1,465 | \$161 | \$1,465 | \$161 |
| 4,101-33,000 | \$5,045 | \$5,552 | \$507 | \$5,552 | \$507 | \$4,848 | \$5,286 | \$437 | \$5,286 | \$437 |
| 33,001-96,000 | \$38,490 | \$38,095 | (\$394) | \$38,095 | (\$394) | \$36,990 | \$36,633 | (\$357) | \$36,633 | (\$357) |
| 96,001-500,000 | \$77,755 | \$76,940 | (\$816) | \$76,940 | (\$816) | \$74,726 | \$73,978 | (\$748) | \$73,978 | (\$748) |
| 500,001-1 Million | \$186,613 | \$184,622 | (\$1,991) | \$184,622 | (\$1,991) | \$179,343 | \$177,500 | (\$1,843) | \$177,500 | (\$1,843) |
| > 1 Million | \$287,010 | \$301,503 | \$14,493 | \$301,503 | \$14,493 | \$275,817 | \$289,852 | \$14,035 | \$289,852 | \$14,035 |
| Total | \$596,804 | \$608,950 | \$12,146 | \$609,275 | \$12,472 | \$573,543 | \$585,377 | \$11,834 | \$585,748 | \$12,205 |
| Grand Total | \$1,329,534 | \$1,336,692 | \$7,158 | \$1,337,266 | \$7,732 | \$1,277,697 | \$1,284,722 | \$7,024 | \$1,285,385 | \$7,688 |

Note: Detail may not add due to independent rounding.
Source: Proposed RTCR Cost Model.

Evaluation of Regulatory Options

Overall, the estimated net costs of the AIP option are approximately \$10 million annually (Exhibit 7.25). This is significantly below the threshold (\$100 million annually) for an economically significant rulemaking. In addition, the evaluation of several sensitivity analyses shows that this conclusion of not being economically significant does not change even when substantial changes in the most uncertain modeling assumptions are taken into account. At approximately \$27 million annually, the Alternative Analysis is also well under this threshold. At the state level, the total estimated net cost increase is estimated to be less than \$0.5 and \$0.8 million under the AIP and Alternative Analysis, respectively. This translates to an annual net cost increase of less than \$10,000 per state annually under the AIP (approximately \$14,000 under the Alternative Analysis), though individual state cost will vary significantly based on the number of PWSs in the state.

The overall net changes in costs are driven by the interaction of specific rule components as shown in Exhibit 7.26. The estimated increases in net costs from the TCR for both the AIP and Alternative Analysis are primarily driven by the increased routine monitoring and costs for

1 corrective actions. Smaller contributions to the net cost increases come from assessments and
2 administrative activities. The largest offsets of net cost increases (net cost decreases) come from
3 reductions in additional routine monitoring and public notification.
4

5 The large difference in net cost increases between the AIP and the Alternative Analysis is
6 primarily driven by the increased number of routine samples taken under the Alternative
7 Analysis in comparison to the AIP. A larger number of samples are also estimated to result more
8 in Level 1 and Level 2 triggers and to subsequently require corrective actions based on Level 1
9 and Level 2 assessments. Overall, the total net costs of the AIP are estimated at less than 40% of
10 the net costs of the Alternative Analysis. This cost difference is an important consideration in
11 the selection of the AIP over the Alternative Analysis as the preferred proposed RTCR option.
12

13 Exhibit 7.27 shows that the most significant cost impacts falls on the smallest TNCWSs
14 (serving ≤ 500 people), which is driven by the high numbers of PWSs combined with the worst
15 predicted baseline occurrence in this category. The costs estimated under the AIP
16 (approximately \$6.5 million annually) are significant for that subset of PWSs. Selection of the
17 Alternative Analysis would almost triple that cost to this category of PWSs, which often have the
18 most limited resources to address issues. Magnifying that impact, the Alternative Analysis costs
19 are heavily front loaded, making the cost differential even more pronounced at the beginning of
20 the regulatory period. Significant impacts are also estimated for CWSs serving 4,101 to 33,000
21 people, driven by the relatively high number of CWSs in this category, combined with relatively
22 high unit costs for implementing corrective actions for PWSs of this size. However, PWSs of
23 this size (and CWSs in general) are expected to be better able to absorb cost increases by passing
24 costs through to a larger base of customers. Overall, the most important drivers of total net costs
25 are the numbers of PWSs and the underlying baseline occurrence estimates in a given size
26 category. Taken together, these influence the numbers of samples and ultimately the numbers of
27 corrective actions taken, which drive the cost estimates.
28

29 Exhibit 7.28 shows the costs from Exhibit 7.27 on a per-PWS basis. On this basis, the
30 annual impact of the proposed RTCR generally increases with PWS size and the magnitude of
31 the annual per-PWS net costs do not appear to be prohibitive, even for the most heavily impacted
32 PWS categories. However, the range of per-PWS costs is expected to be fairly wide and some
33 individual PWSs may be more heavily impacted.
34

References

- 1
2
3 Association of State Drinking Water Administrators (ASDWA). 2001. *Drinking water program*
4 *resource needs assessment*. Version 9. November 27, 2001.
5
6 Means, R.S. 1998. *Mechanical Cost Data*. Kingston: R.S. Means Company, Inc.
7
8 United States Census Bureau. 2008. *Current Population Survey. Annual Social and Economic*
9 *Supplement*. Population Division, Education & Social Stratification Branch.
10
11 United States Environmental Protection Agency (USEPA). 2000a. *Development of Cost of*
12 *Capital Estimates for Public Water Systems*, Final Report.
13
14 United States Environmental Protection Agency (USEPA). 2000c. *Guidelines for Preparing*
15 *Economic Analyses*. U.S. EPA Office of the Administrator. EPA/240-R-00-003. September
16 2000.
17
18 United States Environmental Protection Agency (USEPA). 2001. *Third Edition of the Water*
19 *Industry Baseline Handbook (Baseline Handbook)*. May, 2001.
20
21 United States Environmental Protection Agency (USEPA). 2003a. *Labor Costs for National*
22 *Drinking Water Rules*.
23
24 United States Environmental Protection Agency (USEPA). 2006a. *Ground Water Rule Economic*
25 *Analysis*. Office of Water. EPA 815-R-06-014. October 2006.
26
27 United States Environmental Protection Agency (USEPA). 2008b. *Draft Information Collection*
28 *Request for the Microbial Rules*. OMB Control Number: 2040-0205. EPA Tracking Number:
29 1895.04.
30
31 United States Environmental Protection Agency (USEPA). 2008c. *Draft Information Collection*
32 *Request for the Public Water System Supervision Program*. OMB Control Number: 2040-0090.
33 EPA Tracking Number: 0270.43.
34
35 United States Environmental Protection Agency (USEPA). 2009a. *Technology and Cost*
36 *Document for the Revised Total Coliform Rule, Draft Report*. April 2009.
37
38