The Department of Energy
Washington, DC 20585

December 7, 2001

W-00-31-II TMDL
Comments Clerk Water Docket (MC-4101)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

Dear Sir or Madam:

The purpose of this letter is to provide comments to the Environmental Protection Agency (EPA) on the *Notice of Availability of a Draft Report on Costs Associated With the Total Maximum Daily Load Program and Request for Comments*, published in the Federal Register on August 9, 2001. The draft report and the support documents assess the cost of monitoring impaired waters, developing total maximum daily loads (TMDLs) for the listed waters and implementing the TMDLs. These costs are based on both the existing program as well as the requirements in the July 2000 rule.

As stated in the Department of Energy (DOE) comments provided in February 2001, the cost to the regulated community, including DOE facilities, for complying with the revised TMDL program is an issue of concern. With over sixty-nine facilities in twenty-seven states across the nation, the cost of implementing the July 2000 rule will have a significant impact on DOE operations. Based on our review of the draft report and supporting documents, DOE believes it is premature to issue this report until a complete analysis considering all of the important variables that influence implementation cost is conducted. The basis for this conclusion is provided in Enclosure 1. We further believe that the limitations of the cost estimates, data, methodology and assumptions in the draft report do not provide the basis to fully evaluate the majority of the actual cost factors associated with TMDL implementation. Enclosure 2 provides specific comments on the cost functions used by EPA as they would apply to direct metals dischargers.

The Department is willing to provide assistance to EPA in conducting a complete cost analysis. DOE has additional data that may help provide some insight into the issues and cost variables that need to be addressed in conducting this cost analysis.

The Department appreciates EPA's consideration of these comments. The designated staff person regarding this subject is Lois Thompson. If there are questions regarding these comments, please contact Ms. Thompson at (202) 586-9581 or by e-mail at lois.thompson@eh.doe.gov.

Sincerely,

Andy Lawrence
Director
Office of Environmental Policy and Guidance

Enclosures

Enclosure 1

U.S. Department of Energy
Comments on
Notice of Availability of a Draft Report on Costs Associated With the Total Maximum Daily Load Program and Request for Comments
Federal Register August 9, 2001

The U.S. Department of Energy (DOE) has reviewed the Environmental Protection Agency (EPA) draft total maximum daily load (TMDL) cost report. We are providing the following comments concerning the quality of the report, and on the cost variables, methodology and cost estimates presented in the report and supporting documents. The Department believes that establishing, developing, and implementing TMDL cost estimates must include a full assessment of uncertainty and take into account what is achievable using existing technologies, and policies such as best management practices. All of these are relevant to the total cost of implementing TMDLs. For example, the DOE/Savannah River compliance cost for the proposed mercury TMDL for portions of the Savannah River site (SRS) is estimated to exceed $300 million dollars based on a detailed cost estimate analysis conducted by the DOE operation and maintenance contractor at Savannah River. We are concerned because this draft and the supporting documents do not reflect all of the variables that influence implementation cost and do not have enough documented data to support any conclusion. The Department urges EPA to reconsider the assumptions and approach used in this document.

Cost Function Estimates

The Department's experience with the mercury TMDL for SRS demonstrates that the assumptions used in projecting implementation costs significantly underestimate treatment costs. The cost functions need to be adjusted to recognize that many facilities may need to install new treatment technologies or add multiple new technology steps – not simply a filtration step – to achieve the limits established by the TMDL. For example, at SRS, efforts to try to meet the mercury TMDL would require installation and use of a new, non-filtration technology as well as the addition of multiple steps to the existing process. Specifically, resin bed ion exchange could require installation and use of multiple additional steps to SRS existing process, including a pretreatment filtration process to remove particulate matter, followed by two-stage resin bed ion exchange. Due to the hydrologic characteristics of the site, SRS would also have to install retention ponds for stormwater management. None of these costs, other than the filtration step, are captured by the EPA cost functions. By excluding these costs, EPA's cost functions substantially underestimate the actual implementation costs to be incurred by SRS.

In addition, the cost factors should also provide for some level of project contingency. Failure to include all legitimate project contingency costs underestimates the cost of compliance. For example, in the SRS case, these factors include, but are not limited to: uncertainty regarding

stormwater flows, lack of reliable mercury sampling data, and uncertainty regarding piping and pumping requirements.

The attached paper addresses the above concerns by using information relating to the SRS mercury TMDL as an example of the costs associated with a specific metal TMDL. In light of the results of the cost analysis described in the paper, we recommend that EPA re-evaluate and adjust its metals cost functions to account for the use of treatment trains and support processes (rather than use of a single filtration step) required for TMDL compliance, and to account for contingency and other project costs. If EPA's metals cost functions are adjusted accordingly, they will likely provide more realistic estimates of the implementation costs associated with metals TMDLs.

This report acknowledges that there is not an adequate analysis of all of the important cost variables. There are repeated references to " the time frame for this report" as the reason many variables were not included in this analysis. EPA's should allow adequate time to develop cost estimates that reflect all of the major factors that influence cost. Data quality and accuracy of cost estimates should be the primary factors that influence this report. The draft report states: "Other sorts of costs are omitted from this analysis not because we define them as outside of our analytical scope, but because we have been unsuccessful in finding a way to estimate them within the time and data constraints for this study (page 26)." The omitted costs are essential for a complete analysis. The premise that technology-based requirements and their associated costs are incurred pursuant to other sections of the Clean Water Act other than 303(d) and are not included in this analysis is not valid for purposes of estimating valid total compliance costs. These requirements' costs do indeed impact the TMDL implementation cost. Because of the interrelationship of the TMDL program and the national pollutant discharge elimination system (NPDES) program, EPA must look at all of the cost involved. It is virtually impossible to separate the cost variables. The Department recommends that EPA utilize a more systematic process for soliciting cost data from federal agencies and industry. The Federal Advisory Committee could also be reinstated to ensure all possible data analyses techniques are utilized to develop accurate data and perform a complete analysis.

Case Studies are Insufficient

DOE agrees that the 15 case studies are not representative of all conditions that may be found in potential TMDL as stated in footnotes number 13 and 14. The sample is too small to draw any substantive or definitive conclusions. The draft report states: "Given the wide variations in the sorts of waters and impairments that actual TMDLs will address, a sample of 15 completed TMDLs is obviously far short of an ideal data base from which to draw conclusions and some regions are under represented." This fact is repeated in the footnotes throughout the documents and supports DOE's belief that this report should not be issued without substantial revisions at this time. If more samples are to be included in the final version, we recommend another comment review period be initiated to provide opportunity for further comment on the final draft. "Groundtruthing," the process of comparing the data against actual TMDLs that have been developed is a valid approach. But again, we urge EPA to proceed with caution in making any conclusion based on the information presented.

1998 303(d) List of Impaired Waters is not an Adequate Baseline

The Department agrees that the 1998 303(d) list provides the most comprehensive picture of impaired waters to date, but the exclusion of other regulatory related factors that influence TMDL implementation costs does not convey an accurate picture of these costs. Excluding the cost of whatever amount of TMDL progress achieved through technology-based requirements and advanced treatment measures after1998 should be reevaluated. This distorts the analysis by omitting these compliance costs.

For example is the consideration of the impacts resulting from state implementation of the Federal Water Quality Guidance for the Great Lakes System (40 CFR Part 132). The methodology should consider the TMDL costs resulting from implementation of the Great Lakes Initiative (GLI). The discussion on page 16 of the draft report identifies 36,000 TMDLs that need to be developed. This baseline was established using data from the Clean Water Act (CWA), Section 303(d) State lists issued in 1998. The majority of these lists were issued prior to state implementation of the Federal GLI- based standards. The evaluations in support of the 1998 CWA Section 303(d) lists do not appear to consider whether water segments are meeting the federal GLI-base standards. The GLI-based water quality standards are much lower, as much as three orders of magnitude more stringent than previous water quality standards. With such changes, it is reasonable to expect that the 1998 CWA Section 303(d) lists for states subject to GLI grossly underestimate the number of TMDLs that must be developed over the next 20 years. In addition, it is reasonable to expect much greater incremental cost to achieve TMDLs to meet the much more stringent GLI standards. In many instances, application of more advanced controls and costly improvements in treatment technologies and monitoring applications will be necessary.

DOE recommends that EPA factor into its TMDL estimates the full cost burden associated with GLI implementation as well as other regulatory and guidance initiatives that impact the implementation of TMDLs. Alternately, if the GLI impacts are not quantifiable, it is recommended that EPA clearly state that TMDL costs associated with the GLI implementation are generally not captured in the 1998 CWA Section 303(d) lists and it is expected that these costs will be substantial.

Independent Review of TMDL Program Recommendations

DOE believes that this draft EPA report reinforces the need for EPA to reevaluate the TMDL development and implementation process. The National Academy of Sciences (NAS) recommendation of adaptive implementation in the June 2001 report, *A*ssessing *the TMDL Approach to Water Quality Management* is an approach which will relieve the burden to provide a concrete scientific bases for the TMDL program given the uncertainties that are identified in the EPA draft report and the DOE comments provided. In their recommendations, NAS states that "the adaptive implementation process begins with the initial actions that have a high degree of certainty associated with their water quality outcome." The plan described by NAS includes

"immediate actions, an array of possible long-term actions, success monitoring and

experimentation for model refinement. Long-term actions are those that show promise, but need further evaluation and development. .....The commitment in the plan is to further evaluate such actions based on the collection of additional data, data analysis and modeling." DOE supports adaptive implementation and recommends that EPA implement a graded approach considering the NAS recommendations and the need to consider cost and benefits of proposed TMDL actions. It is important to implement programs for which there is a reasonable expectation of beneficial results. Where uncertainty is large, a graded approach will be useful by implementing measured responses with expectations of real gains while allowing time to evaluate more rigorous approaches to ensure they are likely to have a positive net benefit.

Enclosure 2

U.S. Department of Energy (DOE)
Comment on
The National Costs to Implement TMDLs (Draft Report)
Support Document #2
for
"The National Costs of the Total Maximum Daily Load Program (Draft Report),"
August 2001, USEPA

Introduction

The DOE Office of Environmental Management (EM) has reviewed the Environmental Protection Agency's (EPA) draft report and supporting documents on implementation costs associated with the Total Maximum Daily Load (TMDL) program. We are providing the following comments relating to concerns that the cost functions used to estimate implementation costs incurred by direct metals dischargers may substantially underestimate the actual costs which will be incurred by facilities in order to comply with TMDLs.[1] The two areas of concern by the Department are:1) many factors, representing the large majority of the cost have been omitted, and 2) cost factors that were included were underestimated.

EPA's TMDL compliance cost functions for "metals" (which can be used to estimate costs associated with several pollutants, such as mercury, aluminum, arsenic, etc.) are based on the use of filtration as the "next treatment step" necessary for TMDL compliance.[2] Some metals dischargers may need to use other, more costly treatment technologies in order to comply with the limits established by actual TMDLs. As an example of the costs associated with "metals" TMDLs, we used information relating to the use of two other technologies (resin bed ion exchange and constructed wetlands) to comply with a recently finalized mercury TMDL, which affects the DOE Savannah River Site (SRS).

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[1]EPA's cost functions are as follows:
Capital Cost: $\ln(Y1)= 12.0126 + 0.48025\ln(X) + 0.04623 (\ln(X))^2$ Operation and Maintenance (O&M) Cost: $\ln(Y2)= 11.5039 + 0.72458\ln(X) + 0.09535(\ln(X))^2$ Where: Y1= capital costs (1989 dollars),Y2= O&M costs (1989 dollars/year), X= flow rate (in million gallons per day). For a detailed description of the capital and operation and maintenance cost functions used in this analysis, refer to *National Costs to Implement TMDLs (Draft Report) Support Document #2* Appendix E, Page E-3.

[2]According to EPA, the "next treatment step" for point sources is defined as "a further treatment technology, depending on the specific pollutant, beyond the technologies assumed to be in place to meet effluent guideline requirements." (See page I-5 in *The National Costs to Implement TMDLs (Draft Report): Support Document #2*)

The results of this analysis indicate that EPA's "metals" cost functions, which refer only to the use of filtration for TMDL compliance, appear to substantially underestimate the implementation costs associated with complying with the mercury TMDL. We recommend that EPA re-evaluate and adjust its cost functions to account for costs associated with the various technologies that may be needed in order to comply with actual "metals" TMDLs. This adjustment would likely produce a more accurate estimate of the total national costs incurred by point sources to comply with TMDLs for all pollutant categories.

Savannah River Site Mercury TMDL Background

EPA Region IV recently finalized a "phased" TMDL for the State of Georgia, entitled *Total Maximum Daily Load (TMDL) for Total Mercury in Fish Tissue Residue in the Middle and Lower Savannah River Watershed*. The TMDL requires National Pollutant Discharge Elimination System (NPDES) point sources, including SRS, to develop and implement mercury minimization plans, focused on reaching a 2.8 parts per trillion (ppt) water quality standard. There is no known technology that will achieve mercury concentrations at this level. Therefore, SRS has considered the use of two types of technologies to reduce mercury in its effluent: resin bed ion exchange and constructed wetlands. Although resin bed ion exchange will allow for the greatest mercury reductions,[3] it is also more expensive than constructed wetlands. SRS has recently completed a constructed wetlands project for copper and mercury treatment.

EPA's cost functions apply to industry groups, not specifically to DOE facilities. Therefore, we conducted two analyses for comparison with EPA's estimates: one analysis estimating the costs of resin bed ion exchange as they relate to industry groups, and one analysis using data from SRS's constructed wetlands project.

EPA Cost Functions for Metals

In Section II of the *National Costs to Implement TMDLs (Draft Report) Support Document #2,* EPA outlines the cost functions used to estimate the implementation costs incurred by point sources pursuant to TMDLs. EPA used separate cost functions for each facility, depending upon the type of pollutant being discharged. Costs were calculated by inputting each facility's flow (in million gallons per day) into the capital and operations and maintenance (O&M) cost functions. Costs were then summed over all dischargers to estimate total national costs. *Support Document #2* does not provide cost functions that are specific to mercury reduction. Therefore, we used the EPA cost functions associated with the reduction of metals to obtain an estimate of the costs that EPA's model would predict for SRS.

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[3]Preliminary studies have indicated that resin bed ion exchange can achieve mercury concentrations of 12 ppt, while constructed wetlands (a less expensive treatment option) can achieve concentrations of 30 ppt.

To estimate the costs that EPA's "metals" model would predict for SRS, we inputted SRS's flow, expressed in million gallons per day (MGD), into EPA's capital and O&M cost functions for metals dischargers (described in Appendix E of *Support Document #2*, page E-3). We then compared these results against estimates calculated from an Oak Ridge National Laboratory (ORNL) study,[4] as well as actual SRS constructed wetlands data. The methods and results of the analyses are described below.

Implementation Costs for Resin Bed Ion Exchange

Methods

To compare the predictions made by EPA's cost functions with the costs incurred by industry groups to comply with mercury TMDLs, we used information from a study conducted by ORNL.[5]

From ORNL's study, we made the following assumptions:

1. A two-column system with a sorbent cost of $\$1000/ft^3$ will be needed to reduce mercury to the greatest extent possible.
2. Construction costs are a function of the processing flow rate through each column.
3. The volume of resin bed needed depends upon the flow rate. A 1 MGD flow gives a flow rate of $2.63 m^3$/minute through the resin bed. We assumed the resin bed volume is 20 times the flow rate(e.g. for a flow rate of 2.63 m^3/minute, approximately 53 m^3 of resin bed is needed).
4. Capital cost=$94035x^{0.6809}$, where x is the resin bed volume (in m^3).
5. O&M cost=7% capital cost.[6]
6. ORNL's cost functions apply only to the costs associated with the resin bed columns and materials, and do not include other factors, such as retention ponds for stormwater management, contingency, and other project costs.

From EPA's draft report, we assumed that the "metals" cost functions include only the costs associated with filtration columns and filtration media and, like ORNL, do not

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[4]Refer to *Demonstration of Mercury Sorbents to Meet DOE Customer Needs*.

[5]Refer to *Demonstration of Mercury Sorbents to Meet DOE Customer Needs*.

[6]Refer to Figure 21in *Demonstration of Mercury Sorbents to Meet DOE Customer Needs*. We used the capital cost for each outfall (calculated from the equation in assumption 4) and roughly estimated the O&M cost associated with it. We then determined what percentage of capital cost is represented by each O&M cost and averaged over all outfalls.

include other essential factors, such as retention ponds for stormwater management, contingency, and other project costs.

Results

The results for the resin bed ion exchange analysis are summarized in Table 1.

From the assumptions above, we estimated the capital costs for each outfall and summed over all outfalls to calculate a total capital cost of **$14.7 M**, and annual O&M costs of **$1.09 M**.[7] In contrast, EPA's cost functions predicted capital costs of **$2.8 M**, and annual O&M costs of **$1.5M** for resin bed ion exchange. Therefore, EPA's model, which is based on filtration, appears to substantially underestimate the costs of the ion exchange columns and media associated with mercury TMDLs.

More importantly, the EPA estimates do not address any of the major ancillary costs incurred for essential support facilities (e.g. pretreatment, retention ponds for stormwater management to equalize flow, etc.). In addition, they do not include the costs of contingency and other projects costs. These factors could greatly increase the cost of complying with the mercury TMDL. For example, when these additional factors were considered, SRS estimated capital costs of greater than $300 million for resin bed ion exchange.[8]

[7]It should be noted that annual O&M costs do not include the cost of resin bed replacement.

[8]Refer to *Westinghouse Savannah River Company (WSRC) Comments Regarding EPA's Information Collection Request (ICR # 1560.06) for the National Water Quality Inventory Reports (Clean Water Act Section 305(b)) and Proposed Revisions to EPA's Regulations Implementing Section 303(d)*.

Table 1
Resin Bed Ion Exchange Capital and O&M Costs:
EPA's Predictions Compared to ORNL[a]

Outfall	Flow (MGD)	EPA Capital Costs	EPA O&M Costs	Column/Media Capital Costs	Column/Media O&M Costs
A-01	0.926	$ 158,887	$ 93,785	$ 1,325,483	$ 92,784
A-11	2.04	$ 336,230	$ 202,167	$ 2,239,134	$ 156,739
D-1A	0.023	$ 51,991	$ 25,020	$ 107,056	$ 7,494
F-01	0.11	$ 71,524	$ 31,860	$ 310,737	$ 21,752
F-02	0.085	$ 66,814	$ 29,648	$ 260,705	$ 18,249
F-03	0.01	$ 51,991	$ 25,020	$ 60,717	$ 4,250
F-05	0.09	$ 67,794	$ 30,092	$ 271,052	$ 18,974
F-08	1.32	$ 217,560	$ 130,814	$ 1,687,359	$ 118,115
G-10	1.05	$ 173,059	$ 104,057	$ 1,443,898	$ 101,073
H-02	0.142	$ 76,982	$ 34,643	$ 369,745	$ 25,882
H-04	0.17	$ 81,371	$ 37,025	$ 417,947	$ 29,256
H-07	0.05	$ 59,207	$ 26,608	$ 181,651	$ 12,716
H-08	1.286	$ 211,957	$ 127,445	$ 1,657,643	$ 116,035
H-12	1.15	$ 189,541	$ 113,967	$ 1,536,165	$ 107,532
H-16	0.3384	$ 103,416	$ 50,551	$ 667,879	$ 46,752
K-06	0.337	$ 103,253	$ 50,443	$ 665,996	$ 46,620
S-04	0.037	$ 55,925	$ 25,628	$ 147,978	$ 10,358
X-04	0.056	$ 60,622	$ 27,107	$ 196,223	$ 13,736
X-08	0.41	$ 111,431	$ 56,031	$ 761,120	$ 53,278
Total Capital and Annual O&M Cost (1989 dollars EPA; 1998 dollars ORNL)		$ 2,249,555	$ 1,221,910	$ 14,308,488	$ 1,001,594
Total Capital and Annual O&M Cost (May 2001 dollars)[b]		***$ 2,807,444***	***$ 1,534,719***	***$ 14,737,743***	***$ 1,091,737***

[a] In EPA's cost functions for metals, when flow is less than 0.023 mgd, costs are assumed "as if flow was 0.023mgd," and for flow>1mgd, there is "a proportional increase in costs relative to costs for treating a flow of 1 mgd."

[b] EPA's cost functions produce estimates in 1989 dollars, while ORNL's costs are expressed in 1998 dollars. For EPA: Capital costs are converted to May 2001 dollars by multiplying the 1989 cost by 1.248 (the result of dividing the May 2001 producer price index for materials and components for construction (151.4) by the 1989 producer price index for materials and components for construction (121.3)). O&M costs are converted to May 2001 dollars by multiplying the 1989 cost by 1.256 (the result of dividing the May 2001 producer price index for all finished goods (142.7) by the 1989 producer price index for all finished goods (113.6)). For ORNL: Capital costs and O&M costs are converted in the same fashion, except the producer price indexes for 1998 are used. The 1998 capital costs are multiplied by 1.03**,** and the 1998 O&M costs are multiplied by 1.09**.**

Implementation Costs for Constructed Wetlands

Methods

The capital and O&M costs of the wetlands project constructed at SRS to treat one outfall with a flow of 0.926 MGD were $4.86 M and $120,000 per year, respectively. At SRS, there are five outfalls with mercury concentrations greater than 30 ppt. To extrapolate from the constructed wetlands project to the five outfalls, we converted the capital cost into a unit cost of $5.25 M per MGD.[9] We then calculated the capital costs and O&M costs (assuming that O&M costs are 2% of the capital cost) for each outfall, and summed over all outfalls. The total capital cost and O&M costs for constructed wetlands (before accounting for contingency and "other project costs") are approximately $27.07 M and $541,465, respectively.

To account for contingency and "other project costs" (in accordance with the DOE Project Manual), we assumed that contingency was 50 percent, and that "other project costs"were 20 percent of the total capital cost. The final estimates of costs are calculated as follows:

Total Capital Cost= ($ 27.07M) * 1.50 + 0.20*($ 27.07M)
Total O&M Cost= 0.02*Total Capital Cost

To calculate the costs predicted by EPA's model, we inputted SRS's flow for each of the 5 outfalls into EPA's cost functions (see footnote on page 1), and summed over all outfalls.

Results

The results for constructed wetlands (before contingency and other project costs are considered) are summarized in Table 2.

As shown in Table 2, the EPA capital cost function greatly underestimates the capital costs of constructed wetlands (i.e. $1.18 M versus $27.03 M). In addition, the EPA estimates do not include costs for contingency and other project costs, which may be substantial.

Accounting for contingency and "other project costs," the total capital cost is **$ 46.02 M**, and the total O&M cost is **$920,380.** In contrast, the total capital and O&M costs predicted by EPA's cost functions are **$1.18 M**, and **$682,787**, respectively. Again, as was the case with resin bed ion exchange, EPA's cost functions underestimate the implementation costs likely to be incurred by SRS as a result of the TMDL.

Table 2

[9]Calculated by dividing $4.86 M by 0.926 MGD.

Constructed Wetlands Capital and O&M Costs:
EPA's Predictions Compared to SRS[a]

Outfall	Flow (MGD)	EPA Capital Cost	EPA O&M Cost	SRS Capital Cost	SRS O&M Cost
A-11	2.04	$ 336,230	$ 202,167	$ 10,706,695	$ 214,134
F-08	1.32	$ 217,560	$ 130,814	$ 6,927,862	$ 138,557
G-10	1.05	$ 173,059	$ 104,057	$ 5,510,799	$ 110,216
H-16	0.3384	$ 103,416	$ 50,551	$ 1,776,052	$ 35,521
X-08	0.41	$ 111,431	$ 56,031	$ 2,151,836	$ 43,037
Total Capital and Annual O&M Cost (1989 dollars)		$ 941,696	$ 543,620		
Total Capital and Annual O&M Cost (May 2001 dollars)[b]		***$ 1,175,237***	***$ 682,787***	***$ 27,073,243***	***$ 541,465***

[a] In EPA's cost functions for metals, when flow is less than 0.023 mgd, costs are assumed "as if flow was 0.023mgd," and for flow>1mgd, there is "a proportional increase in costs relative to costs for treating a flow of 1 mgd".

[b] EPA's cost functions produce estimates in 1989 dollars. Capital costs are converted to May 2001 dollars by multiplying the 1989 cost by 1.248 (the result of dividing the May 2001 producer price index for materials and components for construction (151.4) by the 1989 producer price index for materials and components for construction (121.3)). O&M costs are converted to May 2001 dollars by multiplying the 1989 cost by 1.256 (the result of dividing the May 2001 producer price index for all finished goods (142.7) by the 1989 producer price index for all finished goods (113.6)).

Conclusion

Many different types of pollutants could fall into EPA's "metals" category. Depending upon the pollutant type, different technologies may be needed in order to comply with the water quality standards required by an actual TMDL. For example, although there is no known technology which will allow SRS to achieve mercury concentrations of 2.8ppt, two technologies achieve substantial mercury reductions: resin bed ion exchange, and constructed wetlands. The results of this analysis indicate that EPA's "metals" cost functions, which are based on the use of filtration as the "next treatment step," appear to substantially underestimate the costs associated with the use of either resin bed ion exchange or constructed wetlands in an attempt to comply with the mercury TMDL.

In addition, past studies conducted by Westinghouse Savannah River Company (WSRC) estimated the total capital costs associated with the use of resin bed ion exchange for mercury TMDL compliance at over $300 million. This figure accounts for approximately 23 percent of EPA's upper-end estimate of the total national costs to point sources for

compliance with the "more cost-effective TMDL program."[10] We therefore recommend that EPA re-evaluate and adjust its cost functions in order to capture the full range of costs associated with the various technologies that may be needed in order to comply with actual "metals" TMDLs. This adjustment would likely produce a more accurate estimate of the total national costs incurred by point sources in order to comply with TMDLs for all pollutant categories.

References

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U. S. Environmental Protection Agency. August 1, 2001. *The National Costs of the Total Maximum Daily Load Program (Draft Report).* EPA 841-D-01-003.

U. S. Environmental Protection Agency. August 1, 2001. *The National Costs to Implement TMDLs (Draft Report): Support Document #2.* EPA 841-D-01-005.

U.S. Environmental Protection Agency, Region IV. February 28, 2001. *Total Maximum Daily Load (TMDL) For Total Mercury in Fish Tissue Residue In the Middle & Lower Savannah River Watershed.*

Westinghouse Savannah River Company. August 18, 2000. *Westinghouse Savannah River Company (WSRC) Comments Regarding EPA's Information Collection Request (ICR # 1560.06) for the National Water Quality Inventory Reports (Clean Water Act Section 305(b)) and Proposed Revisions to EPA's Regulations Implementing Section 303(d).* Letter # ESH-ESS-2000-00281.

[10]Refer to *The National Costs of the Total Maximum Daily Load Program (Draft Report)*, Executive Summary, Page ii.