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CLEAN WATER ACT

When Wall Street analysts calculated the statutory maximum civil penalty in a Clean Water Act case against Massey Energy Company and several affiliated companies, a great deal of negative ''buzz'' was generated because of the potential magnitude of the fine, according to the author of this article. However, the author says the courts have been very reluctant to impose statutory maximum penalties. In this article, the author provides background on the issues in the case and, based on his experience as a consultant in these matters, offers his view of how the penalty actually will be calculated.

Will Massey Energy Company Suffer Severe Penalties in Clean Water Act Case?

BY ROBERT H. FUHRMAN

Wall Street analysts and media reports have suggested Massey Energy Company faces a potential liability of $2.4 billion for alleged violations of the Clean Water Act.[1] I was retained by the company to assess its liability and have reached a far different conclusion. Even assuming the government is successful in its assertion of liability, my opinion, which I explain in detail below, is that the likely penalty is in the range of $1.5 million to $7 million if this case is adjudicated.

Case Background

On May 10, 2007, in the U.S. District Court for the Southern District of West Virginia, the Department of Justice filed suit against Massey Energy Company[2] and twenty-seven of its affiliates for allegedly violating the

[1] This figure appeared in several publications, including Lawrence Messina's Associated Press article titled ''Massey Responds to Federal Action,'' May 14, 2007. It was also picked up by several newspapers, including the *Washington Times*. A shareholder lawsuit was filed July 2, 2007, against 14 board members of Massey Energy, alleging corporate mismanagement and citing as evidence the EPA lawsuit over Clean Water Act violations (131 DEN A-4, 7/10/07).

[2] On the basis of total sales revenue, Massey Energy is the nation's fourth largest coal producer.

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Clean Water Act 4,633 times between Jan. 1, 2000, and Dec. 31, 2006.[3]

The alleged violations include several conventional pollutants. The lawsuit did not make allegations about fish kills or human health effects, serious or otherwise.

For the most part, the discharges were storm water containing pollutants such as total suspended solids, iron, manganese, aluminum, and pH into Kentucky and West Virginia waterways in excess of legally-binding daily maximum and/or average monthly permit limitations.[4,5] The alleged violations typically involved by-products of soil-disturbing operations and periodic failures to keep pH within an allowable range.

Because the federal government treats each violation of a monthly average limitation as if it constituted thirty or thirty-one days of violations,[6] the complaint alleged 69,071 days of violation. However, Massey Energy asserts that there were no violations on thousands of those days.[7]

To place the alleged number of violations in context, it should be clearly understood that the defendants operated approximately 2,500 permitted outfalls during the years in question. When one multiplies that number of outfalls times 365 days per year, times seven years, times four for the minimum number of pollutants covered by most of the permits, one calculates that there were 25,550,000 possible events during this time period when violations could occur. The 69,071 days of alleged violations constitute a compliance rate of 99.7 percent.[8]

That information not withstanding, in accordance with various laws and regulations, each day of violation in this case is subject to a maximum daily fine of either $27,500 or $32,500.[9]

Extrapolating from the maximum daily fines, two Wall Street analysts[10] calculated that Massey Energy's ''worst case'' liability would equal or exceed $2 billion. However, the highest court-imposed fine in a Clean Water Act case is $12.6 million[11]; $34 million is highest settlement in such a case[12]; $3.1 million is the highest settlement announced so far in a case focused on storm water violations.[13]

The question therefore arises: how likely is it that Massey Energy will ultimately pay a fine approaching the $2 billion recounted in some media reports?

To attempt to answer this question, this article first explains how the federal government addresses Clean Water Act civil penalties, both in settlement and in cases that proceed to a judicial decision. Next, the article reviews the outcomes of six adjudicated cases.

In the last portion of the article, I discuss my preliminary analyses of the amount of economic benefit that the defendants may have obtained through noncompliance in this case and other information that affects my view of the likely penalty outcome.

Statutory Framework. Section 309(d) of the Clean Water Act states:

> Any person who violates [a relevant section of the Act] . . . shall be subject to a civil penalty not to exceed $25,000[14] for each violation. In determining the amount of a civil penalty the court shall consider the

[3] According to the records of West Virginia Department of Environmental Protection, all nine of the largest coal producers in the state reported exceedances of their effluent limitations during the years 2000 to 2005. Based on the state's database and without correcting for contested violations, it would appear that Massey Energy and the other defendants in this case were responsible for approximately 230 alleged days of violation per million tons of annual coal production. Four West Virginia coal companies had more alleged days of violation per million tons (the highest being approximately 490 per million tons); and four had lower numbers of days of alleged violations per million tons. The former group of companies primarily perform surface mining in West Virginia. The latter group is primarily in the business of underground mining. The defendants are engaged in a broad mix of surface and underground mining operations.

[4] After receiving delegations of authority from EPA, Kentucky and West Virginia environmental agencies were empowered to establish effluent limitations that at least meet federal water quality require-ments. However, delegated state agencies may also set permit limits that are more protective than necessary, or that are broader in scope (e.g., covering ''waters of the state'' where EPA would not have Clean Water Act jurisdiction).

[5] Some pollutants, such as total suspended solids, iron, manganese, and aluminum are subject to both maximum daily and monthly average limitations. The underlying logic is that both large, isolated discharges and moderate, chronic releases are potentially harmful. Since the maximum daily limit is always higher than the average monthly limit, a violation of the daily maximum may lead to a violation of the monthly average. This is particularly true in situations in which the defendants are required to have sampling performed once in the first two weeks and once in the second two weeks of each month. If, when the independent samplers arrive at an outfall, the pond is not flowing, according to the government's interpretation, whether a monthly average limitation has been violated may depend on just one sample!

[6] In *U.S. v. Allegheny Ludlum Corporation*, 366 F. 3d 164, 58 ERC 1225 (3d Cir. 2004), the U.S. Court of Appeals for the Third Circuit raised serious questions about the automatic translation of the violation of a monthly average limitation into violations equivalent in number to the number of days in the relevant month. See, in particular, pages 187-189 of that decision.

[7] Massey Energy believes that many of the alleged violations stem from erroneous interpretations of permit requirements, such as report-only thresholds; specific limitations issued in error by state regulators; total suspended solids ''exceedances'' that ''go away'' under Kentucky's consideration of an alternative standard for ''settleable solids'' during storm events; and EPA's rigid translation of each monthly average permit violation into a full month of violations even when an outfall did not flow during many days of that particular month.

[8] The number of alleged days of violations (69,701) divided by 25,550,000 (the product of 6,387,500 times four parameters) equals .2728 percent (the noncompliance rate). Thus, the compliance rate was actually 1 minus .2728 percent, which equals 99.73 percent.

[9] Pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, as amended by the Debt Collection Improvement Act of 1996, 31 U.S.C. § 3701 note, and 69 Fed. Reg. 7121 (February 4, 2004), EPA may seek civil penalties of up to $27,500 per day for each violation occurring on or after January 30, 1997 through March 15, 2004, and up to $32,500 for each violation occurring after March 15, 2004.

[10] These analysts work for Banc of America Securities and Credit Suisse.

[11] U.S. v. Smithfield Foods, Inc., 972 F. Supp. 338, 354, 45 ERC 1387 (E.D. Va. 1997).

[12] Prior to the settlement of that case in 2003, EPA alleged that Colonial Pipeline Company, Inc. was guilty of gross negligence when a segment of its pipeline burst on June 27, 1996, spilling 22,800 barrels of diesel fuel into a river.

[13] The $3.1 million settlement with Wal-Mart was finalized in 2005.

[14] See footnote 9.

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seriousness of the violation or violations, the economic benefit (if any) resulting from the violation, any history of such violations, any good-faith efforts to comply with the applicable requirements, the economic impact of the penalty on the violator, and such other matters as justice shall require.[15]

Section 309(d) does not specify how much weight should be given to each of these factors. Nor does it provide guidance about how the federal government and the courts should go about making case-specific penalty determinations.

The Approach EPA Takes in Settlement

EPA's standard approach in settlement is articulated in its *Interim Clean Water Act Settlement Penalty Policy*,[16] which assumes that economic benefit and gravity are additive. The relevant formula is as follows. In settlement, the penalty should equal the amount of after-tax economic benefit that the defendant obtained due to noncompliance plus a calculated additional amount of money for the gravity or ''seriousness'' of the violations. Two sections below discuss how EPA calculates the monetary value of (1) the economic benefit and (2) the gravity components of Clean Water Act civil penalties.

However, for now, it should be understood that the gravity component of the penalty may be increased by up to 150 percent due to the recalcitrance of the defendant or decreased by up to 10 percent due to the defendant's willingness to enter quickly into a settlement with the Agency. The gravity component may also be reduced to reflect some percentage[17] of the after-tax present value cost[18] of ''supplemental environmental projects'' (SEPs, or mitigation projects) that the defendant agrees to undertake to improve the environment, subject, of course, to EPA pre-approval.

Taken together, the economic benefit and gravity components constitute the preliminary penalty amount. EPA's litigation team may decide to further reduce that amount due to litigation considerations and/or to restrictions on the defendant's ability both to pay a penalty and to undertake injunctive relief.

How EPA Calculates Economic Benefit. To calculate ''economic benefit,'' EPA uses computer software created on its behalf, the so-called ''BEN'' model.[19] An analyst using BEN – usually an Agency employee or an outside consultant – uses as inputs to the model the pollution-control-related capital costs, annual operations and maintenance expenses, and any one-time expenses[20] that should have been incurred to prevent past and/or current noncompliance.

Non-cost inputs to BEN include the useful lives of relevant pollution control equipment; the dates of noncompliance, compliance, and assumed penalty payment; inflation factors; the firm's combined marginal federal and state tax rates; and a single interest rate that EPA considers to be the appropriate ''discount rate.''[21]

Based on the inputs, the model makes adjustments to the relevant costs for inflation, taxation, and what EPA considers the ''time value of money.'' Next, BEN creates two distinct sets of cash flows – one for what it would cost for the defendant to have achieved ''on-time'' compliance and one for ''delayed'' (or actual world) compliance.

The model then mechanically determines the present value for each set of cash flows as of the date of alleged noncompliance. The difference between these two present values is said to be the economic benefit of noncompliance as viewed from the date of noncompliance. Following that step, BEN compounds the ''economic benefit'' for interest from the date of noncompliance to the date of assumed penalty payment. BEN uses the same interest rate both for discounting and for adjusting past calculated values forward in time.

EPA's ''discount rate'' methodology and its application have been subjects of dispute since the mid-1980s[22] when EPA first started using BEN. EPA initially utilized in BEN the ''cost of equity capital,'' a very high expected rate of return, for purposes of both discounting future cash flows to dates in the past and for adjusting past calculated values to their present value as of the date of assumed penalty payment. The use of the cost of equity capital in BEN-like analyses was in effect rejected by the U.S. District Court for the Southern District of Indiana in 1991 in *U.S. v. Roll Coater*.[23]

Without admitting that EPA's prior use of the equity rate in BEN was incorrect, in 1992 EPA started using the ''weighted average cost of capital'' (WACC) as BEN's interest forward/discount rate. WACC reflects the costs of both equity capital and debt, weighted by their relative mix in the firm's capital structure. In contrast to the use of the equity rate in BEN, the use of the ''weighted average cost of capital'' results in significantly lower calculations of economic benefit, everything else being equal.

Federal district courts have reached dramatically different conclusions about the appropriate interest forward rate to use in litigated cases, upholding at various times the equity cost of capital,[24] the ''weighted average cost of capital,''[25] and the after-tax risk-free rate associ-

[15] 33 U.S.C. § 1319(d).

[16] The ''Interim'' policy was published on March 1, 1995 and never revised.

[17] EPA provides credit for SEPs on a sliding scale, depending on several different factors to reflect the characteristics of the project.

[18] The concept underlying this adjustment is that a dollar received today is worth more than a dollar received one year from now, and the further the payment is in the future, the less it is worth today. For example, using a 10 percent discount rate, a dollar received one year from now is worth only 91 cents today. A dollar received two years from now is worth only 83 cents today.

[19] BEN is short for ''economic benefit.'' In September 1999, Industrial Economics, Inc., under contract to EPA, produced the *BEN User's Manual*, which explains how BEN works and how it is to be applied.

[20] For example, if it was necessary to seek a permit modification to achieve compliance, the cost of seeking the permit modification would be treated as a one-time expense.

[21] In corporate finance, a discount rate is used to determine the present value of expected future cash flows. See footnote 18.

[22] *See, e.g., U.S. v. Louisiana Pacific Corp., 846 F.2d 43 (9th Cir. 1988)*.

[23] *U.S. v. Roll Coater*, 21 Envtl. L. Rep. 21073 (S.D. Ind. 1991).

[24] *Friends of the Earth v. Laidlaw Environmental Services*, 890 F. Supp. 470, 40 ERC 2063 (D.C. S.C. 1995).

[25] *U.S. v. Smithfield Foods, Inc.*, 972 F. Supp. 338, 354, 45 ERC 1387 (E. D. Va. 1997).

ated with U.S. Treasury bills,[26,27] an even lower rate for compounding past savings to present values.[28] In spite of the rejection of the ''weighted average cost of capital'' as the interest forward rate in *U.S. v. WCI Steel* (1999) and in *U.S. v. The New Portland Meadows* (2003), and strong challenges to this approach by the U.S. Court of Appeals for the Third Circuit in *U.S. v. Allegheny Ludlum* (2004)[29], EPA still uses the ''weighted average cost of capital'' as the sole interest rate in BEN for making financial adjustments for the time value of money, whether backward or forward in time.

Gravity. Although in any Clean Water Act case the defendants may argue that the alleged violations caused little or no environmental harm, the *Interim Clean Water Act Settlement Penalty Policy* assumes that there is always a gravity component to the penalty. The document provides an approach to calculating gravity that considers such factors as the number of months in which there were violations, the percentage by which effluent limits were exceeded, actual or potential harm to human health and the aquatic environment, the number of effluent limit violations each month, and the significance of non-effluent limit violations, if any. These criteria involve a point system that leaves substantial room for subjectivity. The total number of points is multiplied by $1000 to calculate the gravity component of the penalty prior to any adjustments.[30]

Legal Status of the 'Interim' Policy. EPA adopted its *Interim Clean Water Act Settlement Penalty Policy* and most, if not all, of its statute-specific civil penalty policies without following Administrative Procedures Act requirements for rulemakings. As a result, they do not carry the force of law in federal district court.

The following passages appear in EPA's ''Guidance on the Distinctions Among Pleading, Negotiating, and Litigating Civil Penalties for Enforcement Cases Under the Clean Water Act'' (1989):

> The results of our gravity analysis of the Clean Water Act penalty policy, although applicable in NPDES [National Pollutant Discharge Elimination System] settlement discussions, are irrelevant to our litigation approach and should never be introduced into evidence by the United States or advanced as representing Agency *litigation* penalty policy. . . .
>
> If the defendant in a judicial case attempts to depose EPA personnel on the gravity calculations for settlement purposes under the Clean Water Act penalty policy, either in the case at hand or other cases, this should be vigorously opposed by government counsel under Rule 29(b) as not 'being reasonably calculated to lead to the discovery of admissible evidence.' If the defendant in a judicial case attempts to introduce the Clean Water Act Penalty Policy into evidence, this should be opposed as irrelevant. . . .[31]

Nonetheless, in many cases that settle, the government uses its gravity calculations as a bargaining chip to talk defendants (1) into undertaking SEPs and (2) into paying a higher penalty than one just based on economic benefit. Although SEPs may be used to reduce the gravity component of the penalty, EPA policy forbids their use for reducing the economic benefit component.

Approach Government Takes in Court

According to EPA:

> The existence and extent of economic benefit is a factual matter which may be objectively measured in dollar terms. Therefore, to support the United States' figure on economic benefit government litigators may introduce [in court] a witness expert in the application of financial analysis as used in the BEN program.
>
> The penalty policy's settlement gravity analysis, however, must be abandoned in favor of a more stringent, statutorily-grounded approach if penalties in a case are litigated. Specifically, the government should then offer into evidence facts that are related to the gravity-oriented statutory criteria, such as the magnitude and duration of the violations, the actions available to the defendant to have avoided or mitigated the violations, or any environmental damage. The government should argue as an advocate that the presence of these facts warrant assessment of a civil penalty of a given amount.[32]

In cases that proceed to trial, attorneys for the federal government emphasize what the maximum statutory penalty would be for the alleged violations. They usually recommend a penalty of a lower magnitude that they believe is on the high side of what the court may accept, but they always strenuously argue that economic benefit should be treated by the court as the minimum civil penalty it should impose.

Past Outcomes of Adjudicated Cases

Past judicial decisions illuminate the range of possible outcomes that may result from adjudication. The cases fall into two categories: those that followed the ''top-down'' approach and those that followed the ''bottom-up'' alternative.

Examples of 'Top-Down' Decisions. Courts following the ''top-down'' approach start with the statutory maximum penalty and then adjust that figure downward in light of

[26] *U.S. v. WCI Steel, Inc.*, 72 F. Supp. 2d 810 (N.D. Ohio 1999). See also *U.S. v. The New Portland Meadows*, No. 00-507-KI , 07/29/03, slip opinion, page 10.

[27] The decision of the U.S. Court of Appeals for the Third Circuit in *U.S. v. Allegheny Ludlum*, 366 F. 3d 164 (3d Cir. 2004) raised many objections to the use of the ''weighted average cost of capital'' as an interest forward rate. See, in particular, pages 178-183.

[28] For a detailed discussion of the methodological issues surrounding the controversy over EPA's choice of interest forward rates, see Robert H. Fuhrman, ''U.S. v. The New Portland Meadows Deviates from 'BEN' Methodology,'' (244 DEN B-1, 12/19/03).

[29] 366 F. 3d at 176-184.

[30] If the ''Interim'' policy is to be taken at face value, the score for actual or potential harm to human health ranges from a minimum of zero to a maximum of 50 points per month. That is, from zero dollars to $50,000 per month. The policy, however, does not provide guidance about how to score different situations that may pose greater or lesser risks to human health.

[31] Edward E. Reich, then Deputy Assistant Administrator for Civil Enforcement, et al., ''Guidance on the Distinctions Among Pleading, Negotiating, and Litigating Civil Penalties for Enforcement Cases Under the Clean Water Act,'' January 19, 1989, page 9.

[32] Ibid., page 8.

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Section 309(d) factors such as ''good faith efforts to comply'' and ''such other matters as justice may require.'' For example, in applying the top-down approach in *Catskill Mountains Chapter of Trout Unlimited, Inc. v. City of New York*,[33] the U.S. District Court for the Northern District of New York could have set the statutory maximum penalty at $463,249,000. Instead, after considering mitigating factors, the Court set the penalty at $5,749,000.

In *Public Interest Research Group of New Jersey, Inc. v. Powell Duffryn Terminals, Inc.*,[34] the U.S. District Court for the District of New Jersey determined that Powell Duffryn's economic benefit from noncompliance exceeded the statutory maximum penalty. Nonetheless, in light of the actions and/or nonactions of EPA and the New Jersey Department of Protection in that case, the Court decided to set the penalty at $3,205,000, one million dollars below the statutory maximum.[35]

In another top-down case, *Hawaii's Thousand Friends v. City and County of Honolulu*,[36] the U.S. District Court for the District of Hawaii determined that the statutory maximum penalty was $249.5 million. For the defendants' failure to have an operational secondary treatment plant, the plaintiffs' economic expert witness calculated economic benefit to be $39.95 million. After considering the projected loss of a federal subsidy due to the delay in constructing the facility, the defendant's expert calculated economic benefit to be $5.6 million.

However, after considering the lack of quantifiable harm and the defendants' good faith reliance on interim effluent limits set by an appropriate state authority, the Court imposed a relatively modest civil penalty: $250,000. As the decision stated, ''Starting from Section 309(d)'s ceiling of maximum civil penalties, the determination of the appropriate civil penalty is a matter within the sound discretion of the trial court.''[37]

Examples of 'Bottom-Up' Decisions. Other courts have followed the ''bottom-up'' approach, in which the trier of fact considers the evidence and then provides an explanation of his or her penalty decision in light of the various Section 309(d) considerations.

The decision of the U.S. District Court for the Eastern District of Virginia in *U.S. v. Smithfield Foods, Inc.*, is typical of the bottom-up approach. Based on the number of days of violations, the Court could have set the monetary penalty at $174.6 million. However, after examining the evidence and each of the 309(d) factors, the Court set the penalty at $12.6 million—three times the amount of economic benefit it concluded that Smithfield had obtained due to noncompliance.[38]

In *U.S. v. Municipal Authority of Union Township and Dean Dairy Products Company, Inc.* (*Dean Dairy*),[39] if the U.S. District Court for the Middle District of Pennsylvania had followed the top-down approach, it would have started with a statutory maximum penalty of $45,825,000 and worked down from there. However, the Court followed the bottom-up approach, which it stated was the approach taken most frequently in Clean Water Act cases.[40] The Court determined that Dean Dairy had obtained ''wrongful profits'' of $2,015,500 due to noncompliance and doubled that figure to account for all Section 309(d) considerations. It thereby set the civil penalty at $4,031,000.

In its decision in *U.S. v. Allegheny Ludlum Corporation*, the U.S. District Court for the Western District of Pennsylvania could have imposed a statutory maximum penalty of $28.05 million. Instead, it followed the bottom-up method and concluded that due to noncompliance Allegheny Ludlum had obtained an economic benefit of $4.1 million. To account for all Section 309(d) factors, it set the penalty at $8.2 million.[41]

Preliminary Analyses Related to this Case

In mid-May 2007, Massey Energy asked me to review the complaint in this case, the Justice Department's list of alleged violations, and several other documents.

Although the absolute number of alleged violations seemed disproportionately large in comparison with my experience in other Clean Water Act enforcement cases, I readily understood what officials of the company were telling me: many of the alleged violations would probably not stand up to judicial scrutiny either due to the government applying incorrect effluent limits or because certain past violations would not be considered violations today due to regulatory changes.

Since, at that time, I lacked the necessary information to calculate the economic benefit of noncompliance, the best I could do was to compare the facts in this case to the worst-case judicial outcome in *Smithfield Foods* and the largest out-of-court settlement in a Clean Water Act civil case, which, as mentioned before, was EPA's 2005 settlement with Colonial Pipeline Company, Inc. regarding its 1996 spill of 22,800 barrels of diesel fuel into a river.

I found the $3.1 million settlement with Wal-Mart in a storm water case to be an interesting but not fully helpful benchmark. At that time, I did not know how many violations were alleged in that case, what statutory maximum penalty they would have implied, and how much economic benefit EPA believed Wal-Mart had obtained.[42]

Based on the above considerations, my initial conclusion was that, in a settlement, the defendants would ultimately pay no less than $1 million and no more than $25 million, a very broad range. However, it is a range well below the statutory maximum.

Economic Benefit Analysis Based on Subset of Data. After my initial analysis, I visited several of the defendants' coal mining operations in southern West Virginia and eastern Kentucky to learn about the causes of the

[33] 244 F. Supp.2d 41 (N.D.N.Y. 2003).

[34] 720 F. Supp. 1158 (D.N.J. 1989); upheld in part, reversed in part in 913 F.2d 64 (3d Cir. 1990).

[35] That outcome was appealed to the U.S. Court of Appeals, which disagreed and instead imposed the statutory maximum. 913 F.2d at 80-81. To the best of the author's knowledge, no other court ever imposed the statutory maximum in a Clean Water Act civil penalty case.

[36] 821 F. Supp. 1368 (D. Hawaii 1993).

[37] 821 F. Supp. At 1394.

[38] 45 ERC 1401.

[39] 929 F. Supp. 800 (M.D. Penn. 1996)

[40] *Id.*, at 806.

[41] After the remand, a new round of expert reports and expert depositions, and pre-trial rulings by the lower court, that case settled for $2,375,000.

[42] I subsequently learned from a knowledgeable source that there were 5,774 asserted violations in that case; the government calculated the statutory maximum penalty as $167 million; and the government did not share with the defendant an economic benefit estimate based on BEN calculations. It was not even clear that EPA had such an estimate.

alleged violations and what had been done at various outfalls to prevent further noncompliant discharges. At the end of the trip, I requested that Massey Energy provide cost information that I would need to calculate economic benefit related to the forty-three permits allegedly responsible for 70 percent of the violations.

Once that data was obtained, Massey Energy's Director of Environmental Affairs and I reviewed the list of historical compliance costs in light of the alleged violations at each outfall. For many outfalls where noncompliance had occurred on a multi-month basis and then stopped, we were able to identify the expenditures that brought the discharges back into compliance.

In most cases, the ''fixes'' were relatively inexpensive. They involved increased sampling, more use of flocculants and other types of chemicals to increase the precipitation of total suspended solids and other pollutants prior to discharges, more (and in some cases less) use of chemical adjustments to pH, earlier installation of turbidity curtains to slow down the release of discharges through outfalls to increase time for settling out pollutants, earlier and more dredging and pond cleaning, more use of sodium hydroxide tanks, and various permit modifications, including some changes in the location of specific outfalls.

General patterns began to emerge that helped identify what needed to be done to bring about compliance at the outfalls that still seemed to have compliance issues at the end of 2006.

Using the latest version of BEN and an assumed penalty payment date of October 1, 2007, for the forty-three permits constituting 70 percent of the alleged violations, I calculated the economic benefit using the government's standard methodology.[43] The economic benefit results totaled approximated $720,000. To scale up the result to the potential universe of alleged violations, I divided that figure by .7, which resulted in a total estimated economic benefit of $1,028,571.

Given my past experience with BEN and the large number of alleged violations, I had anticipated a much higher result.

Why Were Results Dramatically Lower than Expected? In contrast to my previous experience in economic benefit cases, the delayed and avoided costs included in this analysis tended to involve very inexpensive pollution control measures. Consider the implications of just one example.

Assume that the on-time installation of a $1,000 turbidity curtain would have eliminated many alleged monthly average violations. If there were three continuous years of such violations at an outfall and each such violation translates into thirty or thirty-one days of violations, there would therefore be 1,095 violations that could have been eliminated at a total cost of $1,000. Furthermore, assuming that the curtain was actually installed at the end of the three-year period, the defendants' economic benefit for not installing the curtain three years earlier would be based on the after-tax cost of the interest associated with a three-year delay in spending $1,000, a very small amount of economic benefit.

By contrast, in a typical Clean Water Act civil penalty case, many violations could have been prevented by on-time installation of pollution control equipment costing hundreds of thousands of dollars. In many such cases, it might cost at least one hundred thousand dollars per year to operate and maintain such equipment. Depending on the period of noncompliance and the number of such pieces of equipment required for compliance, this fact pattern could lead to a large civil penalty.

For the most part, this pattern was not typical of the problems encountered in this case.

Will My Estimate of Economic Benefit Hold Up? My first set of BEN calculations have not yet been scrutinized by attorneys and consultants acting on behalf of the United States in this case. Also, I have not yet performed economic benefit analyses for the remaining 30 percent of the alleged violations. I anticipate that there will be push back in the form of criticisms of the cost input assumptions and a possible need to rethink some of the compliance scenarios, but I do not expect my next set of economic benefit results using BEN to be dramatically different from the first set.

Second Range of Penalty Estimates. To develop penalty estimates based on the economic benefit analyses performed to date, I looked to the results in other cases where economic benefit had been calculated.

Assuming that I calculate economic benefit using what I believe is the correct financial methodology, I anticipate that the total amount of economic benefit would be perhaps $750,000. As an alternative, I assume that the upper bound economic benefit figure would be $1.5 million if I employ BEN using the ''weighted average cost of capital'' as the interest forward rate and make various changes to the costs assumptions in light of future discussions with the government.

If the defendants' economic benefit is $750,000 and the court chooses to double it to account for all Section 309(d) factors, as in the district court rulings in *Dean Dairy* and *Allegheny Ludlum*, the Court would impose a $1.5 million penalty.

On the other hand, if economic benefit is determined to be $1.5 million, and it is tripled by the Court to account for all Section 309(d) factors, as in *Smithfield Foods*, the resulting penalty would be $4.5 million. Recognizing that a court might want to use a higher multiple of economic benefit than three, I calculated the high end of the penalty range to be $7 million.

Concluding Remarks

Of course, it is premature to judge how this case will unfold and how much pressure each party might feel to reach a settlement. The defendants must consider the litigation risks they are willing to accept, and the plaintiff must consider its own set of risks, including the pos-

[43] Although I believe that it is incorrect from the stand point of corporate financial theory to use the ''weighted average cost of capital'' as an interest forward rate, at that time I did not perform an economic analysis using what I believe to be the correct financial methodology. In that methodology, all past costs would be brought forward to the assumed penalty payment date by compounding them at interest rates based on after-tax, short-term U.S. Treasury bills; and all future cash flows would be discounted to the same date using a risk-adjusted expected rate of return, such as the ''weighted average cost of capital.'' One would calculate economic benefit by subtracting (1) the present value of all ''delayed and/or avoided'' costs from (2) the present value of all ''on-time'' costs, both calculated as of the assumed date of penalty payment.

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sible establishment of one or more precedents that it may not want to live with over time.[44]

But I can say this much with a very, very high degree of confidence: This case will not be resolved with the imposition of a penalty anywhere near $2 billion. Previous news stories that may have left the general public with the impression that such an outcome is likely fundamentally misunderstood the Clean Water Act and how courts have interpreted it over time. As stated above, I believe that if this case is adjudicated the penalty will be in the range of $1.5 to $7 million.

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[44] For example, one such precedent might establish limits on how monthly average violations are treated when calculating statutory maximum penalties.

In ''Defendants' Memorandum in Support of their Motion to Dismiss,'' several additional, very important issues were raised that could have important precedential effects. One such issue has to do ''piercing the corporate veil.'' Another is of very broad interest to both regulators and the regulated community: In the immediate aftermath of the Supreme Court decision in *Rapanos v. United States*, 126 S. Ct. 2208, 62 ERC 1481 (2006), does EPA have jurisdiction over violations that involve ''waters of the State'' that are neither navigable nor tributaries of navigable water?

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