

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

THE PHILLIPS 66 COMPANY,)	
)	
Petitioner,)	
)	
v.)	PCB No. 12-101
)	(Permit Appeal NPDES)
ILLINOIS ENVIRONMENTAL)	
PROTECTION AGENCY,)	
)	
Respondents.)	

NOTICE OF ELECTRONIC FILING

To: See Attached Service List


PLEASE TAKE NOTICE that on December 31, 2012, I electronically filed with the Clerk of the Pollution Control Board of the State of Illinois, c/o John T. Therriault, Assistant Clerk, James R. Thompson Center, 100 W. Randolph St., Ste. 11-500, Chicago, IL 60601, RESPONDENT'S REPLY BRIEF, a copy of which is attached hereto and herewith served upon you.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

LISA MADIGAN,
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BY: 
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Dated: December 31, 2012

CERTIFICATE OF SERVICE

I hereby certify that I did on December 31, 2012, cause to be served by First Class Mail, with postage thereon fully prepaid, by depositing in a United States Post Office Box in Springfield, Illinois, a true and correct copy of the following instruments entitled NOTICE OF ELECTRONIC FILING and RESPONDENT'S RESPONDENT'S REPLY BRIEF upon the persons listed on the attached Service List.


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This filing is submitted on recycled paper.

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THE PHILLIPS 66 COMPANY,)	
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)	Permit Appeal (NPDES)
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RESPONDENT'S REPLY BRIEF

Respondent, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ("Illinois EPA" or "Agency"), hereby files this Reply Brief in response to the Petition requesting remand and modification of the NPDES permit issued to Phillips 66 Company ("Phillips") on December 2, 2011 for the Wood River Refinery. The only issue remaining before the Board is whether the Petitioner has met their burden in proving that the mercury mass limit and denial of a mixing zone for mercury are not necessary to accomplish the purposes of the Act and Board regulations.

The Respondent submits that the Agency's decision to deny a mixing zone for mercury is necessary to accomplish the purposes of the Illinois Environmental Protection Act ("the Act"), and certainly not arbitrary and unnecessary. Alternatively, if the Board finds that the decision is not supported by the Record, the Respondent submits that the permit should be remanded and direct Petitioners to supplement their permit application with sufficient data upon which the Agency can make a more reasoned decision concerning whether the pilot-tested Granular Media Filtration ("GMF") system is best degree of treatment. Even if the Board finds that Phillips' existing system, and not the GMF, is the best degree of treatment, the Board should remand the permit and require that Phillips provide the necessary data for determining whether a mixing zone is available under Section 302.102(b) of the Board's Water Pollution regulations. 35 Il. Adm. Cod 302.102(b).

Finally, the Respondent submits that the Agency's decision to require a mass limit for mercury was not arbitrary and is consistent with the Board's regulations. The Petitioner has not met its burden to show the limit is not necessary to accomplish the purposes of the Act.

STATEMENT OF FACTS

Illinois EPA's practice in the modified permit and permit renewal to make an individual mixing zone determination for a single pollutant is not an unprecedented practice. In response to comments of Shell Oil, prior owners of the Wood River Refinery, the Illinois EPA documented its approach to mixing, where it stated in a document dated March 12, 1993, that "Allocation of mixing on a parameter by parameter basis allows the best degree of treatment criterion to be evaluated fully for each substance. Granting of an all encompassing mixing zone could possibly open the door to the legal discharge of greater than necessary quantities of regulated substances or other parameters such as whole effluent toxicity." (Doc. 52).¹ The following statement of facts, describe Phillips' application for a modified permit and subsequent renewal permit, and the Record that developed from that application including Illinois EPA's individual mixing zone and permit limit determinations for mercury in those permits.

History of Permit Application for Permit Modification Issued February 2, 2009

On May 12, 2006, Phillips (formerly ConocoPhillips – Wood River Refinery) submitted an application to modify their NPDES permit pursuant to their investment in a multi-billion dollar project that would expand their crude oil capacity from 323,000 barrels per day to 385,000 barrels per day. (Doc. 58; Doc. 100; Resp. Exh. G). The Coker and Refinery Expansion (CORE) Project, as it was referred to by Phillips, included a new 65,000 barrel per day coker unit, and multiple other new units and modifications that would enable the expansion. (Doc. 58). In addition, the improvements would "allow the efficient processing of heavier crude oils from

¹ References to documents in the Record are cited as Doc. ____, according to how those documents are numbered in Respondent's filing of the Record. Petitioners and Respondent's Exhibits from the hearing are cited as Pet. Exh. ____ and Resp. Exh. ____, respectively.

Canada. (Doc. 100; Resp. Exh. G). The CORE project was also slated to include the addition of three wet gas scrubber treatment units at the sites of the three Catalytic Cracking Units, which were to be installed pursuant to a federal consent order. (Doc. 58; Doc. 100; Resp. Exh. G).

As a result of the expansion and the installation of the wet gas scrubber treatment units, Phillips planned a number of modifications to the wastewater treatment plant. (Doc. 58; Doc. 59). The cost of the overall upgrade to the wastewater treatment plant alone was expected to be \$100 million. (Doc. 100; Resp. Exh. G). Operation and maintenance costs associated with the upgrade were estimated to be \$6.7 million per year. (Doc. 100; Resp. Exh. G).

During the processing of the modification permit, Phillips exchanged data with Illinois EPA concerning the levels of mercury in their effluent. (Doc. 83). The data for the period August 17, 2007 to November 28, 2007 showed the average concentration of mercury in Phillips' effluent averaged 12.49286 ng/L. (Doc. 83).

Bob Mosher, a manager in the Water Quality Standards Unit, Division of Water Pollution Control at Illinois EPA, drafted a memo, dated June 13, 2008, which concludes that Phillips' effluent has a reasonable potential to exceed the human health standard for mercury, recommended a permit limit of 12 ng/L, and stated that no mixing zone would be granted for mercury. (Doc. 90; Doc. 93; T. 84). This memo was provided as a recommendation to the permit section, specifically, Jaime Rabins, an environmental protection engineer, registered professional engineer, and permit reviewer at Illinois EPA. (T. 137; Doc. 110; and, Doc. 48).

Mr. Mosher also recommended that Mr. Rabins seek assistance from Darin LeCrone or Al Keller, his supervisors, concerning whether a loading limit for mercury should be added. (Doc. 94). The 30-Day Notice Review Notes, dated December 3, 2008, stated that while the average discharge from the facility increased to 10.97 MGD for outfalls 001 and 001/002, the permittee "agreed to keep loading to currently permitted levels." (Doc. 110). As a result, a load limit of 7.8×10^{-4} lbs/day was included in the permit. The limit was based on the average

mercury concentration provided by Phillips and the previously permitted flow value. (Doc. 83; Doc. 110).

A number of concerns were raised by Phillips concerning the addition of mercury limits in the permit. On September 19, 2008, Phillips' counsel sent a letter to Illinois EPA requesting a 5-year compliance plan "based on the difficulty of identifying consistent levels of mercury, and treatment alternatives." (Doc. 103). In an email dated October 28, 2008, Phillips' counsel requested that the agency use a statistical approach to derive the "antidegradation" mass limit for mercury. (Doc. 107). However, nowhere in this e-mail did Phillips' counsel cite a regulation that requires or directs the agency to use a statistical approach in calculating a mass limit. (Doc. 107).

On November 13, 2008, counsel again wrote to Illinois EPA requesting a statistical approach be used; and, again, the correspondence does not cite to any regulation requiring such an approach be used, nor does it provide any evidence of agency practice in using such an approach with respect to calculating a mass limit. (Doc. 107). In addition, the email correspondence provided suggested language for a special condition that would address the schedule of compliance for the mercury limits and provide a caveat to compliance with these limits, as follows: "If no technology is identified which would allow permittee to comply with the limit, permittee shall seek modification of the limit through a permit modification or adjusted standard." (Both the schedule and the caveat to compliance were included in the permit. (Doc. 115).)

Attached to the November e-mail was a draft memo by Phillips entitled "Mercury Compliance Plan." The Mercury Compliance Plan outlined the following concerns..... (Doc. 5)

- o mercury is ubiquitous in crude oils, varies with different crudes, and varies over time;
- o crudes delivered are often blends from more than one production field and therefore source control or switching to mercury free raw materials is not "a straight forward approach at refineries";
- o it is difficult to predict trends in mercury distribution; and,
- o it is unknown how changes in refinery processes will affect mercury levels.

The concerns outlined in the memo culminated in a request to conduct a pilot study to determine the best technology. Phillips stated that "end-of-pipe wastewater treatment, specifically designed to reduce mercury to the proposed levels, has not been implemented at a refinery," but acknowledged that "several mercury removal systems for wastewater are commercially available." (Doc. 5)

In an attempt to demonstrate that their existing treatment system is the best degree of treatment, Phillips cited the following capabilities of their existing system in the above memo:

- o the existing sulfide and/or hydroxide precipitation processes may be precipitating mercury from the wastewater; and,
- o Mercuric sulfide has the potential to produce mercury concentration levels ranging from 10-20 ug/L (or 10,000 - 20,000 ng/L) and co-precipitation of mercury in the ferric chloride phosphorous removal step in the new treatment system may have the effect of producing mercury concentrations in the 5 ug/L to 0.5 ug/L range. (Doc. 5)

The antidegradation study conducted by Phillips' consultant, Jim Huff, Huff & Huff Inc., was completed in August 2008, a few months prior to this memorandum. The antidegradation study confirms that the existing system would partially treat soluble metals, including mercury. It stated the following with respect to metals in the waste stream:

"Sulfides are present in the process sewers from sources such as sour water stripper bottoms. Under such conditions, metals are precipitated as metal sulfides, with solubility's generally ranging from 1×10^{-5} mg/L to 1×10^{-3} mg/L. The presence of alkaline conditions due to sodium hydroxide (caustic) in the WWTP neutralization section also results in precipitation of metals as metal hydroxides. Depending upon the metal and pH, metal hydroxide solubility's vary from 1×10^{-3} mg/L to 1 mg/L. Existing metal discharge concentrations are already within ranges of these solubilities. Increases or decreases in usage quantities of these metals would be expected to impact amounts precipitated in primary sludges, but not impact effluent concentrations. In other words, reductions in upstream levels of metals, even if technically or economically reasonable, would result in no additional reduction in effluent concentrations."

The report states that the effluent mercury levels are similar to the background levels reported in the Mississippi River. However, the "background" levels obtained from the "Grafton" station, and listed on page 43, merely demonstrate that the majority of the 17 samples for the period October 2002 to September 2005 were "non-detect." The majority of the "non-detect" results

were <0.00002 mg/L or <20 ng/L, which is higher than the human health standard for mercury (Doc. 100).

The antidegradation report goes on to evaluate the potential impact of the effluent on the receiving water. On pages 69 and 70 of the report are charts which demonstrate that the predicted total concentration and predicted dissolved concentration of mercury at either the edge of the zone of initial dilution or edge of mixing zone will not exceed either the Acute or Chronic water quality standard. Neither chart attempts to demonstrate whether the predicted concentrations of mercury at either the ZID or edge of mixing zone will exceed the human health standard, nor is there any attempt to provide such a comparison in the report. (Doc. 100).

Phillips did not appeal the modified permit. Meanwhile, Phillips applied to renew their permit, which was to expire on March 31, 2009. The renewal application was submitted on September 30, 2008 (Doc. 3).

History of Permit Application for Permit Renewal Issued December 22, 2011

During the pendency of the permit renewal, Phillips continued to express concern regarding the mercury limits. However, they had also begun pilot testing mercury treatment technologies pursuant to Special Condition 28 in the renewal permit (Doc. 115). During 2011, Phillips presented the results from the pilot testing to the Illinois EPA, which was considered in the renewal permit evaluation and included in the Record.

First, Phillips provided effluent sample data for their existing wastewater treatment plant, dated July 9, 2009 thru June 21, 2010, that showed that their effluent had an average mercury concentration of 14.8 ng/L. (Doc. 35). An additional three samples for November 30, 2010, December 15, 2010, and January 28, 2011, showed the following mercury results above the human health standard, as follows: 28.6 ng/L, 86.7 ng/L, and 16.4 ng/L, respectively. (Doc. 35).

Next, they demonstrated that the Siemens Granular Media Filtration technology used in their pilot test reduced the concentration of mercury in their effluent by a large percentage. They presented data, entitled "WRR Mercury Pilot Data, Mercury and TSS." The data tracks the level

of TSS and mercury in the influent² and the resulting levels in the Column 1 and Column 2 of the Siemens Pilot conducted between January 21, 2011 and May 6, 2011. (Doc. 34). The accompanying powerpoint (dated March 2011) shows two graphs which compared dissolved mercury, total mercury, and TSS and indicates that the vast majority of mercury in the effluent is not dissolved mercury, and that the levels of mercury in the effluent is highly correlated with the level of TSS in the effluent. In sum, they concluded that the "Average Total Mercury results from GMF unit have been below proposed permit limits (2-3 ng/L range)." They estimated a capital cost of \$9.4 million for full-scale GMF filtration, and an annual operating cost of \$380,000. They continued to articulate some of the same concerns about treating mercury, as follows: 1) that crude feeds vary in mercury levels; 2) the impact of expansion on the distribution of mercury; 3) the effect of oxidation-reduction potential in WWTP activated sludge unit/clarifiers on mercury species/solubility; and 4) exact mercury behavior and species is still unknown. (Doc. 34).

An April 29, 2011 letter from their counsel re-iterated some of the findings above. However, the letter also confirms that very low levels of dissolved mercury were observed, that there is a significant correlation between wastewater treatment plant solids and effluent mercury, and that tertiary filtration is the most promising approach to dealing with the mercury in Phillips' effluent. (Doc. 38). An additional powerpoint presented at a meeting in June 29, 2011, again reiterates the concerns documented in Phillips' March 2011 powerpoint. (Doc. 39; Doc. 34).

In addition to reducing mercury, the GMF technology was favored as a method for treating fecal coliform. In a memo forwarded to the Illinois EPA on April 13, 2011, entitled Fecal Coliform Compliance, Michael Bechtol explains that the use of "ultrafiltration technology with no additional treatment for disinfection could allow [the refinery] to meet both the mercury standard

² Contrary to Petitioner's assertion that Phillips provided data to the Agency indicating that their existing wastewater treatment plant accomplished a 98% reduction of mercury in Respondent's Exhibit D, the data provided indicates that it relates to the pilot study.

as well as the proposed fecal coliform standard.” (Doc. 37). He goes on to request that a compliance date for fecal coliform be aligned with the mercury compliance date.

The memo also discusses alternative solutions for treating fecal coliform, including Chlorination, Ozonation, and Ultraviolet systems. But each were characterized as either unsuitable due to risks of byproducts or potentially ineffective. (Doc. 37). Segregation of the waste stream is considered, but the memo explains that there are “many different and varied sources of domestic waste in the refinery....[which are] widely segregate and scattered throughout the refinery area.” Several complications to segregating of this waste stream are cited including “excavation..., locating the building sewer, and blocking it away from the existing process sewer.” The excavation required is complicated as the areas are “in congested process units, with existing underground piping which makes underground excavation difficult.” None of the compliance options described in the Fecal Coliform Compliance document describe the cost associated with each option. (Doc. 37).

The NPDES permit issued on December 22, 2011 adds a compliance schedule for fecal coliform which conforms to the compliance schedule for mercury. (Doc. 52). The Operational Level compliance date for treating fecal coliform is February 5, 2014, which is the same Operational Level compliance date for treating mercury.

The Illinois EPA also documented in the Record that the Mississippi River is impaired for fish consumption due to mercury and is listed on the 303(d) list for that reason. (Doc. 8). In addition, the February 1, 2010 Industrial NPDES Permit Review Notes identify that a determination was made that adequate mixing exists for certain constituents – but mercury was not included in that list. (Doc. 17).

In addition to what had already been provided in the agency’s Record, Deborah J. Williams, legal counsel at Illinois EPA, wrote an internal memorandum which identified potential other relevant documentation needed in making a mixing zone determination. The memo outlines the three factors for “best degree of treatment of wastewater”: technical feasibility,

sound engineering judgment, and economic reasonableness. She states that the permit reviewer would have the "benefit of design and pilot studies conducted by the facility to determine what technologies are available and what mercury reduction these technologies can achieve" in determining whether the treatment is technically feasible and consistent with sound engineering judgment. She suggests that it is possible the 2008 antidegradation study would have potentially relevant information to the question of economic reasonableness, but that economic reasonableness is likely dependent on a variety of factors. A follow up e-mail suggests that the Record document the name of the "affordability guidance that was referenced in our meetings with [Phillips]." (Doc. 43).

The antidegradation study was completed pursuant to the modified permit application and included as part of the Record for the renewal permit. In addition, the permit reviewer documented earnings for ConocoPhillips by including a Form 10-Q print-out dated August 2, 2011 which documents their net income for the six months ended June 30, 2011 as \$6,420 million and total assets of \$160 billion. (Doc. 42). In addition, the 30-Day Notice Review Notes document that Phillips was asked to submit an analysis in accordance with the "Interim Economic Guidance for Water Quality Standards (EPA-823-B-95-002)" and that Phillips "declined, maintaining that the documents submitted thus far adequately demonstrate that it is economically unreasonable to comply with the mercury limits." The agency also documented in these notes that Phillips "should explore less expensive treatment options based on their findings that the \$14.1 million treatment will allow compliance." (Doc. 48). Phillips did not offer any additional information to support their application.

The draft permit sent to the petitioner on May 21, 2010 indicated an extension until February 5, 2014 to attain operational level and retains the caveat to compliance, that "if no technology is identified which would allow Permittee to comply with the limit, the Permittee may apply to the Illinois Pollution Control Board for an adjusted standard or a site specific rule change." (Doc. 20). This was retained in the version that went out for public notice.

HEARING SUMMARY

Testimony of Jay Churchill

Jay Churchill is the plant manager at the Wood River refinery. He states that Phillips is one of the largest refiners in the United States (T. 10). Of the 1.8 million barrels per day it refines in the U.S., (T. 10), approximately 385,000 (more than 20%) of those barrels will be refined at the Wood River refinery. The expansion project was to increase its capability of processing heavier crude oils from Canada. (T. 10). In November 2011, Phillips commissioned the new refinery delayed coking unit. (T. 11). In the past 10 years, Phillips has spent over a billion dollars on projects which have directly reduced emissions. (T. 11). Mr. Churchill states that the effluent standards in the NPDES permit are "unprecedented and unrealistic" and that "not even BP's [refinery] in Whiting, Indiana, has been subject to such standards," but could not comment specifically as to what standards he was referring to and was not aware of whether that facility had been granted a mixing zone. (T. 12-14).

Testimony of Ron Green

Ron Green, an environmental engineer at Phillips, provided an overview of the wastewater treatment plant configuration (T. 15-20). The wastewater treatment plant upgrades included the "SSC clarifiers, the ASU, the denitrification treatment in Pond Two, the ferric chloride addition for phosphorus removal, and the third final clarifier." (T. 22). He confirmed that "approximately \$100 million was spent on the CORE upgrades to the wastewater treatment plant." (T. 22). As of late 2008, the CORE upgrades to the treatment plant were fully implemented. He also stated that Phillips has not documented any increase in mercury levels as a result of the expansion, but admits that it has not regularly measured its influent and effluent for mercury since late 2008. (T. 23-24).

Testimony of Mike Bechtol

Mike Bechtol is the environmental director at the Wood River Refinery. (T. 28-29). He noted that the initial draft permit issued on November 3, 2006 did not contain a requirement to monitor or treat mercury. (T. 30). In the spring of 2008, the Agency began discussing a 12 ng/L standard to be met on an annual basis and that it could not grant a mixing zone. (T. 30). Phillips met with the agency in November along with their consultant Jeff Allen to discuss the difficulties in treating mercury. (T. 31). They negotiated with the Illinois EPA to increase the originally proposed compliance plan of two years to five years. (T. 31). "The estimated amount of mercury recovered per day by the filter, if installed, is expected to be 0.00078 pounds per day. Over the 25 years that this capital investment would be depreciated, we estimate this project will remove roughly 5.2 pounds of mercury. The [simple] cost of removal is \$2.7 million capital invested per pound of mercury removed..." (T. 32-33).

Mike Bechtol also claimed that Phillips made repeated requests concerning the mixing zone determination, but none of these requests are documented in the Record. (T. 34). He acknowledges that Phillips failed to provide any additional information following the June 29, 2011 meeting. (T. 33). He also acknowledged that Phillips had conducted numerous estimates to try to develop the scope of the project, that the original figures provided to the agency were not the most accurate, and that they never updated the agency between the June 2011 meeting and the date on which the permit was finally issued in December. (T. 35-36).

Testimony of Jeff Allen

Jeff Allen, supervising engineer with Brown and Caldwell. (T. 37). In his summarized and written testimony, Jeff Allen, supervising engineer with Brown and Caldwell, confirms several points already made in the Record. However, he also shares conclusions which are either based on data which was never provided to the Agency or have no basis in any objective data whatsoever. Finally, in somewhat of a contradiction, he explains that while he does not know of any full scale implementation of treatment technologies for mercury at a refinery in this country

(T. 51), he admits that other refineries have proceeded with "more costly membrane filtration for mercury compliance." (T. 41).

First, he confirms and explains several points already made in the Record. He explains that the design target for the system was 5 mg/L in order to "maintain reliable compliance with the 8.5 ng/L annual average value. (T. 39). He acknowledges that during the Phase One sampling study Phillips measured mercury values at Outfall 001 that were consistently greater than 12 ng/L. (T. 39). The Phase Two pilot testing identified that the GMF could achieve the 5 ng/L design target. (T. 40; Pet. Exh. 5). He reiterates the concerns with treating mercury - that an increase in soluble mercury could change over time due to variations in crude source, the refinery process, operating conditions, or wastewater operating conditions. (T. 40-41). He further explains that it is not possible to predict what types of drivers would change the amount of soluble mercury, the amount of mercury on particulates, or the amount of particulates that pass through the filter. (T. 46).

Secondly, he offers conclusions which are based on data that were not provided to the Agency. In an attempt to explain the degree to which the existing system is treating mercury, he offers an engineering analysis on page 5 of his written testimony that was conducted after the permit was issued. (T. 47-48; Pet. Exh. 5). (See Footnote 1). He also offers revised budgetary figures which were apparently shared with Phillips prior to the permit issuance, but do not appear in the Record. (T. 48; T. 35-36; Pet. Exh. 5). He compares case studies concerning the state of mercury treatment technology at other facilities outside the state of Illinois - information which was never shared with Illinois EPA prior to the permit issuance and does not appear in the Record. (T. 50, 54-55; Pet. Exh. 5).

Finally, he provides conclusions or opinions which appear to have no basis in any objective data. He states that it is feasible to treat half of the effluent, but that there would be too much risk and uncertainty in doing so. He did not provide any test results or a detailed objective engineering analysis to substantiate such a conclusion. (T. 43). He suggested that there is a risk

of cross-contamination in allowing the effluent to pass through the polishing lagoon, but did not provide any sampling analysis that supports this conclusion. (T. 44). The majority of the additional engineering costs noted in his written testimony are associated with the lagoon modifications and the sewer force main that would be necessary for bypassing the lagoon. (Pet. Exh. 5).

Testimony of Jim Huff

Jim Huff is a principal of Huff & Huff, Inc. and conducted the antidegradation analysis for Phillips. In Mr. Huff's summarized testimony and written testimony he comments that the granular media filtration system cannot be deemed economically reasonable and stated that "clearly, there are more cost-effective measures that can be taken to reduce mercury releases into the environment." (Pet. Exh. 6, T. 75-76). However, the basis for his statement is a comparison to the costs for treating mercury in emissions at coal-fired power plants contained in a document that was not part of the Agency Record, (Pet. Exh. 7), and he provides no comparison to costs for alternative mercury treatment of the wastewater at the Wood River Refinery. He states that the WRR agreed to no increase in permitted loadings for a list of pollutants, which did not include mercury. (T. 70).

Mr. Huff also states that he had never seen the Agency deny a mixing zone based on a Best Degree of Treatment (BDT) determination, or require a more stringent standard than Best Available Treatment. (Pet. Exh. 6). However, he admits that the Agency has required effluent monitoring for mercury and that on at least a couple of other occasions, according to his search, the Illinois EPA had imposed limits for mercury. (Pet. Exh. 6). Finally, Mr. Huff acknowledges that the antidegradation analysis used effluent data that was analyzed pursuant to a low-level detection method as required by Illinois EPA. (Pet. Exh. 6). But, he also admits that the antidegradation report itself does not evaluate whether the concentration of mercury at the edge of the mixing zone would meet the human health standard. (T. 174-175). While he expects that it would be met, he bases this opinion partly on data he has seen in other streams, not

necessarily the segment of the Mississippi River which borders the facility. (T. 175). In fact, he admits that levels of mercury in other Illinois rivers he has sampled are "highly variable." (T. 171). He admits that the antidegradation report was based on mercury background data which was collected using a less-sensitive detection method, and that he simply "assumed" there was no violation of the human health standard on the Mississippi River. (T. 77-79, 170).

Testimony of Bob Mosher

Bob Mosher is a manager of the Water Quality Standards Section in the Division of Water Pollution Control, Bureau of water at Illinois EPA. Mr. Mosher acknowledges during his testimony that the agency had a policy to prohibit mixing for bioaccumulative substances during the time the agency was attempting to formulate a rulemaking in this regard. (T. 111). However, the agency decided to withdraw that part of the rule-making which dealt with a prohibition on mixing, and subsequently withdrew its policy as well. The policy was in place at the time of the permit modification process and was expressed in Mr. Mosher's June 2008 memo where he stated "no mixing zone is granted for mercury." (T. 112-113). However, the policy was withdrawn following the stakeholder outreach and prior to the June 29, 2011 meeting with Phillips on the renewal permit. (T. 112-115).

Irrespective of the internal policy concerning bioaccumulatives, Mr. Mosher comments that to the best of his recollection, the agency had reason to question what the concentration of mercury was in the effluent following the hearing on the modified permit. (T. 128-129). So, as part of Mr. Mosher's responsibilities at the Agency involve developing updated water quality standard and helping implement them (T. 117), Mr. Mosher obtained mercury effluent data from Phillips in order to conduct a reasonable potential analysis. (T. 86-88). Mr. Mosher concluded that the acute and chronic water quality standard which deal with aquatic life toxicity would not be exceeded by the effluent at end of pipe, but he also concluded that the human health standard of 12 ng/L would not be met and recommended that no mixing zone be granted. (T. 87-88).

Mr. Mosher explains that the 12 ng/L value is a human health standard which protects fish from accumulating high concentrations that would harm human health. (T. 124-125). At the time the standard was passed, approximately 20 years ago, it was thought that if the 12 ng/L of mercury standard were met in all our waters " we wouldn't have any undue body burden in fish for mercury" or they wouldn't bioaccumulate too much mercury; however, he is not convinced 12 ng/L is the right value to ensure human health any longer. (T. 125).

The Mississippi River is listed in the Illinois Integrated Water Quality Report, which is also known as the 305(b) and 303(d) list as being impaired for fish consumption and mercury is listed as a cause. (T. 100). Mr. Mosher goes on to describe mercury as an important problem and that providing an opinion on what is economically reasonable given the lack of information concerning affordability is difficult. (T. 105). Mercury is bioaccumulative, which is part of the reason for the low level water quality standard for human health. It can "go from the water into the flesh of organisms, particulately fish." (T. 98). The standard is low in order to protect fish from accumulating excess burdens of mercury such that those fish would be harmful to humans when consumed. It is his understanding that when a fish has exceeded 0.06 mg/kg an advisory against fish consumption is placed on that body of water. (T. 99). The pounds per day discharged by Phillips admittedly may be very low, but as little as 20 to 30 ug is able to contaminate a 1 lb fish to the point where an advisory would have to be issued. (T. 99). He describes that if all the mercury discharged went from the water to the fish, the difference between 14.8 ng/L and 12 ng/L in the effluent would mean that there would be several thousand fish per day that would be contaminated such that people would have to be advised to limit their consumption. (T. 99-100; Resp. Exh. I).

Regarding the antidegradation report, he states that if someone wanted a mixing zone for the mercury human health standard, some sort of prediction or mass balance analysis should be done and that the mercury values given for the upstream concentration of mercury are not sensitive enough to determine whether the human health standard is being met at the

edge of the mixing zone. (T. 103-105). It is obvious, in his opinion, that the mercury water quality data provided in the antidegradation report was derived from an older mercury laboratory method, and not pursuant to US EPA method 1631. (T. 104). He admits that the monitoring station from which Phillips obtained their background data was an agency water quality monitoring station, but that the agency no longer collects mercury on a regular basis due to limitations at their labs, and that the station is not under his supervision. (T. 115-116). However, Phillips could have collected their own set of background samples. (T. 131).

Mr. Mosher is also part of a team that looks at economic reasonableness as it relates to the water quality standard provision relating to mixing zones. (T. 117-118). One of his tasks within the team is to provide opinions concerning the cost and is one of the reasons he recommends that people use the US EPA guidance which attempts to "get at affordability or economic reasonableness." (T. 118). Mr. Mosher was also familiar with the memo from agency counsel concerning whether there was sufficient basis to grant a mixing zone in this particular case. (T. 89). The determination as to best degree of treatment is a case-by-case determination and such an analysis had never been made for mercury because no one ever asked Illinois EPA for a mixing zone for mercury, which made the analysis unique from that of the other parameters for which Phillips was seeking a mixing zone or already had a mixing zone. (T. 118-121).

Mr. Mosher understood from each of the powerpoints presented by Phillips that the pilot study determined that the average mercury in their effluent was higher than the human health water quality standard indicating they needed further treatment, and that the GMF technology would achieve good results. (T. 91-93). He recalls talking to Jay Rankin of Phillips following the June 29, 2011 meeting at Illinois EPA and asking him about partial filtration as a less expensive option. (T. 94). Mr. Mosher also suggested to his colleagues that use of an "economic affordability analysis" would be appropriate since Illinois EPA had only received a simple dollar amount concerning the cost of implementation. (T. 96). Other concerns he mentioned to his

colleagues were Phillips assertions that the lagoon system would add more mercury and the necessity of boring a new outfall through the levee, a component that would add more cost to the mercury treatment project. (T. 97).

To the best of Mr. Mosher's knowledge, this permit was the first occasion the agency has dealt with whether to grant a mixing zone for mercury (T. 85). He summarized his concerns with respect to granting a mixing zone for mercury, as follows: 1) the impairment of the Mississippi River for fish consumption due to mercury, which he identified as at least relevant to the question of whether there is assimilative capacity in the river for mercury; 2) upstream concentrations of mercury; and, 3) whether the applicant has provided best degree of treatment. (T. 131-132).

Testimony of Jaime Rabins

During his testimony, Jaime Rabins, an environmental protection engineer with the Illinois EPA, explains how he computed the mass limit for the Wood River refinery NPDES permit. Typically a mass limit would be based on a standard in the rules, but that since Phillips had agreed to maintain existing levels for all pollutants (T. 155), he based his calculation on the permitted flow multiplied by the average concentration provided by Phillips (12.5 ng/L) and then by certain conversion factors. (T. 139-140 and 153-155). He clarifies that the permitted flow figure he used "should have been the permitted flow ...prior to the CORE project, the DAF." (T. 139). His understanding was that a mass limit should have been included for a variety of reasons, including federal and state regulatory requirements, and that Phillips had agreed to maintain existing levels for all pollutants in exchange for not having reduced certain other limits. (T. 139-140).

After reviewing the internal memo from legal counsel, he understood that the agency would need to make a determination of whether Phillips had demonstrated the Best Degree of Treatment, prior to making a final mixing zone determination. (T. 142). He recalls attending the June 29, 2011 meeting where Phillips was asked to provide an "affordability analysis" and that

Phillips responded by saying that they had already provided sufficient material. (T. 142).

Information that the agency did receive during that meeting included pilot testing data that showed the GMF technology could achieve the 12 ng/L limit and an overall project cost of \$9.4 to \$14.1 million. (T. 143; Resp. Exh. C & D). He never received any supplemental data following this meeting until the time the permit was issued, nor did he receive any detailed engineering reports relating to the concerns that were briefly highlighted in Phillips powerpoint presentations. (T. 143-144 and 167).

In discussing his best degree of treatment analysis, he highlights certain conclusions in his 30-Day Notice Review Notes (Resp. Exh. K), but admits that this document was not necessarily exhaustive of all the issues that may have been considered by the Agency. (T. 150). With respect to technical feasibility, he notes that Phillips concluded the mercury was bound to solids and that the pilot test of the GMF technology produces results below the proposed limits. (T. 145). His conclusion was that the GMF technology was technically feasible. He documented the market capitalization and net income of ConocoPhillips. He also considered that the Agency's requests of the interim economic guidance were unsuccessful and that Phillips failed to explore less expensive options such as treating half of the effluent and continued use of the lagoon. (T. 146). He states additional cost data would have been helpful. (T. 148-149). He also states that the Agency had asked Phillips on numerous occasions for the status of the CORE project - what units were operating - and never received any reply. It was his opinion that updated data regarding current pollutant loading relative to the status of the project would have been informative in the best degree of treatment analysis. (T. 157).

ARGUMENT

I. Burden of Proof and Standard of Review

The burden of proof lies with Phillips in this permit appeal. 415 ILCS 5/40(a)(1) and 35 Ill. Adm. Code 105.112(a). Section 39(a) of the Act provides, 415 ILCS 5/39(a), in pertinent part, that:

“The Agency may impose such other conditions as may be necessary to accomplish the purposes of this Act, and as are not inconsistent with the regulations promulgated by the Board hereunder.”

Therefore, unless Phillips can prove that the mercury limits and denial of a mixing zone for mercury are not necessary to accomplish the purposes of the Act and Board regulations, the Board must uphold those limits and conditions. The limits and conditions may only be deleted where they are found to be arbitrary and unnecessary. *Noveon, Inc. v. IEPA*, 2004 WL 2146128, PCB 91-17; *Browning-Ferris Industries of Illinois Inc v PCB*, 179 Ill. App. 3d 598, 534 N. E. 2d 616 (2d Dist. 1989).

In making its decision, the Board is limited to the Record before Illinois EPA at the time Illinois EPA issued its permit. “Information developed after IEPA's determination typically is not admitted at hearing or considered by the Board.” *City of Quincy v. PCB*, 08-86, citing *Alton Packaging Corp.*, 162 Ill. App. 3d 731, 738 (5th Dist. 1987). “The Board may not be persuaded by new material....” *Soil Enrichment Materials Corp. v. Environmental Protection Agency* (1972), 5 Ill.P.C.B.Op. 715.); *Illinois E.P.A. v. Pollution Control Bd.*, 118 Ill. App. 3d 772, 780-781, 455 N. E. 2d 188, 19 (1 Dist. 1983).

It should be noted that “the Board's decision will be upheld on appeal when “any evidence in the record fairly supports the action taken by an administrative agency.” *E S G Watts*, 286 Ill. App. 3d at 330, 676 N. E. 2d 299, citing *Farmers State Bank of McNabb v. Department of Employment Security*, 216 Ill. App. 3d 633, 576 N. E. 2d 532 (1991). Illinois

Environmental Protection Agency v. Illinois Pollution Control Bd. 386 Ill. App. 3d 375, 383-384, 896 N. E. 2d 479, 480 (3 Dist. 2008).

Phillips fails to meet its burden. The Agency's denial of a mixing zone and imposition of a load limit for mercury is necessary to accomplish the purposes of the Act. Further, Illinois EPA's decision to deny a mixing zone is consistent with the Board's regulations, where 1) Phillips has failed to show that the Agency's determination that the GMF technology is technically feasible and of sound engineering judgment is not arbitrary; and 2) Phillips has failed to show that the Agency's determination that the GMF technology is economically reasonable is arbitrary. Phillips has not shown that the Illinois EPA is obligated to grant a mixing zone where their existing treatment system is not the best degree of treatment for mercury. Finally, the Agency's imposition of a load limit for mercury is consistent with the Board regulations.

II. Illinois EPA's Decision to Deny a Mixing Zone and Impose a Load Limit for Mercury is Necessary to Accomplish the Purposes of the Act.

The purpose of the Environmental Protection Act ("the Act") places a burden upon dischargers to prevent pollution and maintain compliance with state and federal law. The purpose of the Act is partially stated under Section 2 of the Act, 415 ILCS 5/2, in pertinent part, as follows:

"It is the purpose of this Act...to restore, protect and enhance the quality of the environment, and to assure that adverse effects upon the environment are fully considered and borne by those who cause them....The terms and provisions of this Act shall be liberally construed so as to effectuate the purposes of this Act...." 415 ILCS 5/2(b)-(c).

Further purposes of the Act are cited in Section 11 of Title III: Water Pollution, 415 ILCS 5/11, in pertinent part, as follows:

"It is the purpose of this Title to restore, maintain and enhance the purity of the waters of this State in order to protect health, welfare, property, and the quality of life, and to assure that no contaminants are discharged into the waters of the State....from any source within the State of Illinois, without being given the degree of treatment or control necessary to prevent pollution, or without being made subject to such conditions as are required to achieve and maintain compliance with State and federal law...."

It is a basic tenet of federalism that States typically may impose more strict standards than their federal counterpart. That Illinois EPA is requiring Phillips to implement technology that is beyond Federal BAT is not arbitrary, where implementation will enable Phillips to comply with the Act and the Board's regulations.

The Act is very clear that the burden to protect the environment from adverse effects shall be "borne by those who cause them." Phillips is the discharger here, and it must show that its discharge will not have adverse effects upon the environment. The human health standard for mercury was implemented to prevent adverse effects to humans by preventing dangerous levels of mercury from bioaccumulating in fish flesh. (T. 98). Protecting human health is specifically a goal of Title III of the Act.

In addition, the Act requires that treatment or controls actually prevent pollution. The only caveat to an absolute bar on pollution is that discharges could be made subject to conditions which achieve and maintain compliance with State and Federal law. But the overall goal is to prevent contaminants from being discharged. Phillips has failed to show that the load limit is unnecessary to prevent mercury pollution in the receiving water. In addition, Phillips has failed to demonstrate that use of a mixing zone with their existing treatment system would not result in a violation of the human health standard, which is enough to support the Agency's decision to deny the mixing zone; furthermore, it demonstrates that the mixing zone is necessary to accomplish the purposes of the Act.

However, the Record further demonstrates that the Agency's decision is also consistent with State law and the Board's regulations, and therefore not arbitrary.

III. Illinois EPA's Decision to Deny a Mixing Zone is Consistent with the Board's Regulations.

The Board's Regulations provide that a mixing zone is not available unless the discharger "has made every effort to comply with the requirements of 35 Ill. Adm. Code

304.102." 35 Ill. Adm. Code 302.102(a). In turn, Section 304.102(a) of the Board's Water Pollution Regulations, 35 Ill Adm. Code 304.102, provides, as follows:

"Dilution of the effluent from a treatment works or from any wastewater source is not acceptable as a method of treatment of wastes in order to meet the standards set forth in this Part. Rather, it shall be the obligation of any person discharging contaminants of any kind to the waters of the state to provide the best degree of treatment of wastewater consistent with technological feasibility, economic reasonableness and sound engineering judgment. In making determination as to what kind of treatment is the "best degree of treatment" within the meaning of this paragraph, any person shall consider the following:

- 1) What degree of waste reduction can be achieved by process change, improved housekeeping and recovery of individual waste components for reuse; and
- 2) Whether individual process wastewater streams should be segregated or combined."

Even if treatment of wastewater is "best degree of treatment" within the meaning of Section 304.102(a), an opportunity is allowed for mixing, but is limited by a number of requirements, including the following:

- 1) "No mixing is allowed where the water quality standard for the constituent in question is already violated in the receiving water." 35 Ill. Adm. Code 302.102(b)(9); and,
- 2) "All water quality standards... must be met at every point outside of the area and volume of the receiving water within which mixing is allowed....." 35 Ill. Adm. Code 302.102(c).

The human health standard for mercury, 12 ng/L (35 Ill. Adm. Code 302.208), is more restrictive than the effluent standard for mercury, 0.0005 mg/l or 500 ng/L (35 Ill. Adm. Code 304.126). Where the human health standard is more restrictive than the effluent standard, as it is here, then an opportunity is allowed for mixing "provided the discharger has made every effort to comply with the requirements of 35 Ill. Adm. Code 304.102." The discharger, Phillips, however, has not demonstrated every effort to comply with the obligation to provide the best degree of treatment consistent with technical feasibility, sound engineering judgment, and economic reasonableness. The Agency's determination on whether mixing can be made

available is contingent upon first determining whether Phillips' proposed Granular Media Filtration system is the best degree of treatment. Thus Phillips must show that the Agency's determination that the GMF technology meets the definition of best degree of treatment is arbitrary and not necessary to accomplish the purposes of the Act. In making its inquiry in this regard, the Board need only look to the Record to determine whether the Record fairly supports the decision.

A. Phillips has failed to show that the Agency's determination that the GMF technology is technically feasible and of sound engineering judgment is arbitrary.

The purpose of the pilot study required by the modified permit was to determine if a technology was available that would accomplish the purpose of reducing the concentration and load of mercury in Phillips' effluent. Phillips proposed, and the Agency agreed, to include language in the permit conditions that provided a caveat to compliance with the mercury limit, as follows: "If no technology is identified which would allow Permittee to comply with the limit, the Permittee may apply to the Illinois Pollution Control Board for an adjusted standard or a site specific rule change." (Doc. 108; Doc. 115; and Doc.52) Phillips never appealed the 2009 modified permit which contained the above language. The renewal permit issued in 2011, that is the subject of this appeal, contains this same language.

Phillips demonstrated in the pilot study that the Siemens GMF technology effectively reduced the concentration of mercury in the effluent to 2-3 ng/L, far below the permit limits. (Doc. 34; Resp. Exh. D). Phillips "identified" technology which would allow them to comply with the limit. Thus, the Agency was not arbitrary in determining the GMF technology was technically feasible, where Phillips showed that the technology worked in the pilot study. That Phillips raised certain concerns about the long term effectiveness of the system did not undermine that decision, and the Record itself addresses many of the issues raised.

Prior to pilot testing, Phillips identified several concerns which pointed to end of pipe treatment as the best option for effectively reducing mercury. It stated in its Mercury Compliance

Plan (Doc. 5) that 1) crudes are often blends from more than one production field, 2) that mercury varies with different crudes and over time, 3) that it is difficult to predict trends in mercury distribution, and 4) that refinery processes may have unknown effects on mercury levels. These issues led Phillips to suggest that end of pipe treatment was the appropriate method to test in a pilot study. Phillips indicated that there are several mercury removal systems commercially available and they ultimately pilot tested two options. (Doc. 5)

After the pilot testing, Phillips raised some of the same issues and added to their list of concerns. It continued to state the concern with the potential variation of mercury in crude feeds and the potential impact that processing might have on distribution of mercury. (Doc.34; Doc. 38; and Doc. 39). The variation is a sourcing problem and, again, was one reason why end of pipe treatment was the preferred method of treatment. The distribution problem merely indicated that identifying a waste stream to segregate for mercury treatment would be difficult, which is another reason why end of pipe treatment was chosen.

Next, Phillips' concerns with mercury species, solubility, and mercury behavior are puzzling in light of the explanations they provide in their antidegradation report regarding the capabilities of their existing treatment system and the findings from their pilot study. Phillips concluded in its antidegradation report that its existing system treats soluble metals by precipitating them from the influent. The soluble metals are left behind in the activated sludge. It goes on to claim that "increases or decreases in usage quantities...would be expected to impact amounts precipitate in primary sludges, but not impact effluent concentrations." (Doc.100). Phillips even argues that if upstream levels of metals change, there would not be a corresponding change in the effluent. The pilot study then showed a very strong correlation between TSS and mercury and very low levels of soluble mercury (which would be expected according to the argument provided in the antidegradation report). Thus, the focus in the pilot study turned to treating particulate mercury, since the existing system appeared to be dealing with the soluble form. The GMF technology showed it was capable of reducing the mercury

concentrations more than adequately. Thus, the Agency's decision that the GMF technology was feasible was far from arbitrary.

B. Phillips has failed to show that the Agency's determination that the GMF technology is economically reasonable is arbitrary.

'Economic reasonableness' is not defined in the Act or Board regulations. However, the Board has had occasion to apply an economic reasonableness standard in a variety of cases. Typically, the cases are interpreting whether the Board has determined that implementation of a particular control technology or compliance with a rule will be economically reasonable pursuant to the Board's mandate to take economic reasonableness "into account" under Section 27(a) of the Act. This case involves Section 304.102(a) of the Board's Water Pollution regulations, 35 Ill. Adm. Code 304.102(a). The question is whether the Agency, not the Board, has been reasonable (or not arbitrary) in determining that implementation of the GMF technology at the Wood River Refinery is economically reasonable. Nevertheless, the variety of cases that reflect the Board's analysis of economic reasonableness would be an appropriate guide.

The variety of cases dealing with an economic reasonableness standard include, but may not be limited to: adjusted standards cases (e.g., *EPA v PCB*, 721 N. E. 2d 723, 308 Ill.App.3d 741 (2d Dist. 1999); rulemaking matters (e.g., *In the Matter of : Proposed Amendments to Clean Construction or Demolition Debris Fill Operations (CCDD):Proposed Amendments to 35 Ill. Adm. Code 1100*, R12-9, February 2, 2012); and site-specific rulemaking (e.g., *In the Matter of: Proposed Site-Specific Rule Change for Reilly Chemical Corporation, Granite City Facility*: 35 Ill. Adm. Code 307.1102, R88-9, October 18, 1989; and, *Central Ill. Light Co. v. PCB*, 511 N. E. 2d 269, 159 Ill.App.3d 389 (3d Dist. 1987)).

While the Board has on occasion used a cost per pound yardstick³ in certain cases involving air pollution, there are a number of other concerns that should factor into the cost

³ See *EPA v. PCB*, 721 N.E. 2d 723, 726 (Court found that installation of a powder coating system would be economically reasonable. The Board, in the underlying case, used the average control cost per ton in the Reasonably Available Control Technology rules as a yardstick. Those rules, however, were based on

analysis. The Board has certainly not limited its analysis to arbitrarily assessing whether a certain cost per pound of pollution reduction is sufficient to establish whether implementation of a technology is economically reasonable.

First, the Second Appellate District of Illinois has articulated that the Board should be willing to look at any non-speculative, tangible benefits of installing the subject technology. *IEPA v. PCB*, 721 N. E. 2d 723, 730, 308 Ill. App. 3d 741, 749 (2d Dist. 1999). Secondly, costs for compliance and the environmental harm addressed by the control technology should be viewed relative to other operating costs and other environmental problems addressed by existing operations. *Central Ill. Light Co. v. PCB*, 511 N. E. 2d 269, 159 Ill. App. 3d 389 (3d Dist. 1987). The Board has also found affordability or economic impact an appropriate factor to consider in determining whether the implementation of a particular technology can be considered economically reasonable. *In the Matter of : Proposed Amendments to Clean Construction or Demolition Debris Fill Operations (CCDD): Proposed Amendments to 35 Ill. Adm. Code 1100, R12-9*, February 2, 2012. Finally, whether alternative methods of partial compliance were adequately investigated may be a factor in the overall assessment of economic reasonableness. See *In The Matter Of: The Petition Of The City of Havana For A Site-Specific Rule-Making Rule Change To The Combined Sewer Overflow Regulations*, R88-25 (February 22, 1990).

1. Non-speculative, Tangible Benefits

In *EPA v. PCB*, the Agency argued that the Board should “take into account benefits that will accrue to the petitioner as a result of implementing control technology.” 721 N. E. 2d 723, 730. In that case, the “purported benefit” to the petitioner was the potential settlement of a pending enforcement action. The Second District noted that nothing in the record supported the “purported benefits...with any certainty.” *Id.* at 731. However, the Court agreed that “the Board

an Illinois Institute of Natural Resources study that determined an average cost -- in 1980 dollars—of complying with [air] pollution regulations. The cost related to air pollution control for VOM, not water pollution control measures for mercury.) See also, *In the Matter of: Petition of Greif Packaging, LLXC, For An Adjusted Standard From 35 Ill. Adm. Code Part 218, Subpart TT*, AS 2011-01, (April 5, 2012).

should take into consideration tangible benefits that have been established with some certainty” and are not “....purely speculative.” *Id.* at 731.

None of the compliance options described in the Fecal Coliform Compliance document describe the cost associated with each option. (Doc. 37). But, one thing is clear. No additional cost for treating fecal coliform would be necessary, if the plant relied on the same ultrafiltration system installed to treat mercury. And, it was clear from the Fecal Coliform Compliance document that the other methods of treatment-Chlorination, Ozonation, and Ultraviolet technology-pose other challenges, including dangerous byproducts, the need for upstream tertiary filtration, and “high cost.” (Doc. 37).

It is reasonable to conclude that the Agency presumed that the ultrafiltration offered by the GMF technology was the preferred method, given the Agency’s agreement with Phillips’ to extend the compliance dates for Fecal Coliform to the same compliance dates for complying with the mercury limits. (Doc. 37). The Fecal Coliform Compliance document also appeared to favor this method due to the obvious additional costs associated with segregating the domestic waste stream throughout the plant. (Doc. 37).

While the Phillips failed to provide cost estimates on each of the alternatives presented, it is a logical conclusion that using the same system for both mercury and fecal coliform would result in a significant cost savings. Such a savings is a real tangible benefit of the GMF system beyond the mercury treatment that would be realized by Phillips. Phillips’ calculations as to the cost for treating mercury fail to take this significant tangible benefit into account.

That the fecal coliform issue has since been settled, does not affect what was taken into consideration at the time of the permit decision, and what savings Phillips may still achieve if they are required to proceed with implementing the GMF technology. At the time of the permit decision, the tangible benefit was that Phillips would not have to go to a great expense in separating their sanitary sewer lines throughout the entire plant in order to treat such a waste stream separately for fecal coliform.

2. Relative Costs and Harm

The Third Appellate District of Illinois has found that the Board did not err in finding that a light company failed to demonstrate that compliance was economically unreasonable where the company failed to demonstrate that the relative costs of implementing the controls were excessive in comparison to the relative environmental harm. *Central Ill. Light Co. v. Pollution Control Board*, 511 N. E. 2d 269, 273, 159 Ill. App. 3d 389, 394-95 (3d Dist. 1987). Central Illinois Light Co. (CILCO) documented that a capital expenditure for a physiochemical treatment system to address TSS would be \$4,610,000 with an operating and maintenance cost of \$204,000 for the first year of operation. *Id.* They also claimed that this amount represented 17% of the entire 1985 operating and maintenance budget for the facility's pollution control programs. The Board agreed that the relation of the cost for operating the TSS controls to the entire budget was potentially a factor to consider. *Id.* And, the relative cost could only be demonstrated as unreasonable if the TSS effluent problem bore the same relation to other environmental problems addressed by the facility. As "[t]here was no evidence upon which the Board could determine that these costs were unreasonable, aside from the assertion...that these costs are "certainly not reasonable," and CILCO failed to put the cost figures "into perspective," the Court held that the Board's decision was not arbitrary. *Id.*

While it may appear that the cost per pound of reducing the mercury in Phillips' effluent is a large number, the costs must be put into perspective. As the above case demonstrated, the cost of implementing and/or operating the control technology is of course relevant, but also relevant is the operating cost for the technology in comparison or relation to total operating costs. In addition, while the amount of mercury reduced by the GMF technology may appear to be a small number --and possibly even a small number in relation to what the existing system is reducing-- that figure must be put into perspective. For instance, mercury is not a constituent that with dilution becomes less of a threat to aquatic life. Mercury persists in the environment through bioaccumulation. (T. 98). Also, while the amount discharged by the existing system

might be small, so is the human health standard for mercury. A very small amount of mercury is toxic. Any exposure to mercury could result in long-term neurological damage, chromosomal aberration and teratogenic effects in human beings. See *In the Matter of: Proposed Site-Specific Rule Change for Reilly Chemical Corporation, Granite City Facility*: 35 Ill. Adm. Code 307.1102, R88-9, October 18, 1989.

Despite years of experience and knowledge of the human health standard for mercury, the Phillips' consultant, Jim Huff, relied on outdated data to determine background levels of mercury in the receiving water. The antidegradation report then fails to accurately determine whether the human health standard could be met at the edge of the mixing zone. Phillips then summarily claims that additional treatment would be economically unreasonable.

First, Phillips has failed to look at its own figures to put the cost of the filtration system into perspective. It provided no detail concerning the total cost of operating its wastewater treatment plant as an objective basis for helping to determine whether the annual operating costs for treating mercury are relatively burdensome or not. To the contrary, it indicated that the treatment plant upgrades required by the CORE project would alone cost \$100 million. (Doc. 100; Resp. Exh. G). The capital cost to add the GMF technology was estimated at \$9.4-14.1 million, which would have brought the total capital costs for the CORE project wastewater project to a maximum of \$114 million. Thus, the GMF technology only represented approximately 12% of the capital upgrades to the treatment plant, and only a fraction of a percentage of the multi-billion dollar total CORE budget. In addition, the antidegradation report indicated that the operating costs for the treatment plant upgrades were estimated at \$6.7 million, while the mercury treatment was estimated at only \$380,000 per year. (Doc. 100; Resp. Exh. G). Operating costs for mercury thus only represented approximately 5% of the annual additional operating costs of the wastewater expansion due to the CORE project. The relative cost of implementing mercury treatment as compared to the benefit of ensuring that their effluent will not impact the receiving stream for the human health standard for mercury is

extremely small in comparison to the overall cost of the project and the other costs of wastewater treatment overall at this plant.

In addition, Phillips failed to provide any accurate assessment as to whether the discharge of its effluent would impact the receiving waters, including disregarding the 303(d) listing of fish consumption due to mercury. While there is arguably no direct correlation in how the water is tested to determine an impact for mercury as compared to determining an impact for fish consumption, *Reilly* shows that the Board has documented that historic results from fish testing to show the mercury level in fish tissue is a relevant inquiry in the balancing analysis. *In the Matter of: Proposed Site-Specific Rule Change for Reilly Chemical Corporation, Granite City Facility: 35 Ill. Adm. Code 307.1102*, R88-9, October 18, 1989. Thus, the Petitioners have failed to show that the cost of mercury treatment relative to their other treatment costs far outweigh any relative benefit in the environment of treating mercury.

3. Affordability or Economic Impact

Admittedly, whether a company can afford to install a treatment system is likely not the sole inquiry. However, affordability or economic impact can be a component in determining whether the given environmental benefit achieved by the system is to be reasonably implemented. For example, where groundwater monitoring was found to be not only costly, but costly enough that it "could potentially result in businesses closing," such monitoring was considered economically unreasonable. See *In the Matter of Proposed Amendments to Clean Construction or Demolition Debris Fill Operations (CCDD): Proposed Amendments to 35 Ill. Adm. Code 1100*, R12-9 (February 2, 2012).⁴

Phillips was asked at the joint June 29, 2011 meeting with Illinois EPA to provide information in accordance with US EPA's *Interim Economic Guidance for Water Quality*

⁴ In cases involving municipalities, affordability is frequently taken into consideration in determining economic reasonableness. See *In the Matter of: Petition of the City of Tuscola to Amend Regulations Pertaining to Water Pollution*, R83-23, April 21, 1988 (economic impact relates to affordability of user charges); See also *In the Matter of: Proposed Site Specific Water Pollution Rules and Regulations Applicable to Citizens Utilities Company of Illinois Discharge to Lily Cache Creek*, R81-19, July 3, 1990.

Standards (EPA-823-B-95-002). While Bob Mosher may have colloquially referred to the US EPA guidance as an "affordability" analysis, it is clear that Illinois EPA was asking Phillips to complete documentation under the US EPA guidance which addresses economic impacts. Phillips refused to provide any such information, replying that they had already provided sufficient material. (T. 142).

Completion of the inquiry under the US EPA guidance would have been relevant and helpful in a cost/benefit analysis. The US EPA guidance looks at the economic impact to the company and the community and is merely a more complete way of looking at cost. While the guidance is used in antidegradation analyses, the guidance itself notes its usefulness and relevance in other contexts besides antidegradation, as follows:

"While the terminology is different, the tests to determine substantial and widespread economic impacts (used when removing or granting a variance) are basically the same as those used to determine if there might be interference with an important social and economic development (antidegradation). As such, antidegradation analysis is the mirror image of the analyses described in Chapters 2, 3 and 4 [which deal with substantial or widespread economic impacts]. Variances and downgrades refer to situations where additional treatment needed to meet standards may result in worsening economic conditions; while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions." *Policy & Guidance: Interim Economic Guidance for Water Quality Standards - Chapter 5*, <http://water.epa.gov/scitech/swguidance/standards/economics/chaptr5.cfm>

There is no rule that the Agency must use the US EPA guidance in conducting a best degree of treatment analysis. However, there is no rule that precludes Illinois EPA from using the US EPA guidance as a tool in helping to determine the relative cost of the technology to aid them in determining whether implementation of the technology is economically reasonable. With the little information that the Agency was able to obtain on its own or from Phillips -- the cost of the overall upgrades (\$100 million), the multi-billion dollar cost of the CORE project, the increase in annual wastewater treatment plant operation costs due to the CORE project (\$6.7 million), the net income of the company (\$6,420 million for six months ending June 30, 2011) and the estimate of the mercury treatment (\$9.4-14.1 million) -- the Agency ultimately

determined that the treatment was economically reasonable in order to ensure that the standards could be met and prevent mercury pollution. Certainly additional information that would have put the costs in perspective would have aided in making that determination. However, Phillips failed to provide additional information even after they had completed further engineering design prior to issuance of the permit. (T. 35-36; T. 48).

4. Alternative Methods of Partial Compliance

In looking at economic reasonableness, the Board "must be convinced that other alternative compliance plans have been evaluated" including "methods of full or partial compliance." *In The Matter Of: The Petition Of The City of Havana For A Site-Specific Rule-Making Rule Change To The Combined Sewer Overflow Regulations*, R88-25 (February 22, 1990). Bob Mosher specifically recalls asking a Phillips representative, following their joint meeting on June 29, 2011, about partial filtration as a way to meet the standard and reduce cost. (T. 94). Phillips' consultant, Jeff Allen, testified that partial filtration is feasible but that there is risk in doing so. (T. 43). Phillips has not provided any objective data to demonstrate that it is not possible to meet the standard by doing partial filtration or that there is any risk. Nor did it attempt to show through any objective sampling comparison that boring through the levee and running the effluent through the polishing lagoons was necessary to meet the permit limits. Jeff Allen testified that there is a risk of cross-contamination in using the lagoons. (T. 44). But, again, Phillips has offered no objective sampling data to substantiate such a concern.

In summary, the Petitioners have not met their burden in proving that the GMF technology is economically unreasonable, where they have failed to: 1) take into account the tangible benefit of fecal coliform treatment; 2) take a reasoned look at the cost relative to other treatment costs; 3) provide the Agency with additional economic information to aid in the evaluation of costs and benefits, and 4) provide objective data to support or deny methods of partial compliance.

IV. Illinois EPA's Decision to Include a Mass Limit for Mercury is Not Arbitrary

Where an effluent has the reasonable potential to cause, or contribute to an excursion above any State water quality standard, the Board's regulations provide for limiting contaminants in mass. 35 Ill. Adm. Code 309.143(a)-(b). Specifically, Section 309.143(b) of the Board's Water Pollution regulations, 35 Ill. Adm. Code 309.143, provides that "in the application of effluent standards and limitations, water quality standards and other applicable requirements, the Agency shall...specify...quantitative limitations...in terms of weight..... The Agency may, in its discretion...specify other limitations, such as average or maximum concentration limits...." It is quite obvious that the Board's regulations place a mandatory directive on the Agency to limit in mass, where there is an appropriate application of a water quality standard.

Bob Mosher determined that Phillips' effluent had a reasonable potential to exceed the human health standard for mercury and recommended to Jaime Rabins to seek assistance from Darin LeCrone and Al Keller in determining the load limit for mercury. (Doc. 93; Doc. 94). MR. Rabins then learned from his supervisors that there was an agreement from Phillips to hold contaminants to existing levels, including mercury. (T. 139-140, and 155). As a mass limit would typically be based on a standard in the rules, Mr. Rabins was faced with having to calculate a limit under unique circumstances. He used the average concentration provided by Phillips, multiplied that figure by the permitted flow and then by the appropriate conversion factors. (T. 139-140 and 153-155). He clarified that the permitted flow figure he used "should have been the permitted flow...prior to the CORE project." (T. 139). However, there is no rule that required him to use a statistical method to set the mass limit; thus, his calculation was not arbitrary.

A mass limit is appropriate to limit the discharge and prevent the violation of water quality standards for mercury. However, to the extent the flow figure Mr. Rabins used in the calculation was inaccurate, the permit should be remanded to the Agency, so that the previously permitted flow figure can be used in the calculation and the mass limit updated accordingly.

CONCLUSION

The Record demonstrates support for the Agency's decision to include a mass limit and deny a mixing zone and therefore the Petitioner has not met its burden in proving that the mass limit and mixing zone denial is arbitrary. Even if the Board finds that denial of the mixing zone is not supported by the Record, the Permit should be remanded and Petitioners directed to supplement their permit application with the appropriate economic data and the appropriate background data for mercury so that the Agency has the opportunity to make a more reasoned decision concerning BDT. Even if Phillips existing wastewater treatment system can be considered BDT, the Agency would need the opportunity to evaluate whether a mixing zone can be granted pursuant to the limitations inherent in Section 302.102(b)-(c) of the Board's Water Pollution regulations, 35 Ill. Adm. Code 302.102(b)-(c).

Respectfully submitted,
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Dated: December 31, 2012