Interstate Natural Gas Association of America

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1200 Pennsylvania Avenue, NW
Washington, D.C. 20460-0001

Docket No. EPA-HQ-OPPT-2009-0757

Dear Sir or Madam:

The Interstate Natural Gas Association of America (INGAA), a trade association of the interstate natural gas pipeline industry, submits these comments on the U.S. Environmental Protection Agency's (EPA's) Advance Notice of Proposed Rulemaking: Polychlorinated Biphenyls (PCBs); Reassessment of Use Authorizations, published in the Federal Register on April 7, 2010, 75 Fed. Reg. 17,645.

INGAA member companies transport more than 85 percent of the Nation's natural gas, through some 200,000 miles of interstate natural gas pipelines. Our industry operates more than 1,200 compressor stations across the United States that enable natural gas to be moved safely and efficiently from natural gas production areas to a wide variety of markets all across the country. In addition to its economic importance, natural gas represents the cleanest burning fossil fuel, with lower emissions of greenhouse gases (GHGs), criteria pollutants, and hazardous air pollutants as compared to other primary domestic energy resources. The United States will increasingly rely upon natural gas supply and distribution to meet our electricity generation demands and environmental

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goals. Natural gas pipeline operations are essential to providing new and existing power plants with this clean-burning fuel. EPA's ANPRM also impacts natural gas distribution companies, another essential element of the natural gas value chain, and INGAA supports the comments filed by the American Gas Association to the Advance Notice.

INGAA and its member companies have a long history of working cooperatively with the EPA to understand and manage PCBs in natural gas transmission systems. In that spirit, we are pleased to submit these comments and offer our assistance as EPA considers the use authorization and other PCB related matters. If you have any questions, please feel free to contact me at 202-216-5935.

Sincerely,

Lisa S. Beal
Director, Environment and Construction Policy
Interstate Natural Gas Association of America

Attachments (2):

- **Comments of the Interstate Natural Gas Association of America to the U.S. Environmental Protection Agency Advance Notice of Proposed Rulemaking (ANPR) Regarding the Reassessment of Use Authorizations for PCBs Published 75 Federal Register 17,645, April 7, 2010; and**
- **Summary of Comments in Bullets**

SUMMARY OF INGAA'S COMMENTS TO THE EPA'S PROPOSAL TO ELIMINATE OR SEVERLY LIMIT PCB USE AUTHORIZATIONS ASSOCIATED WITH THE NATURAL GAS TRANSMISSION INDUSTRY

The EPA's current PCB use authorizations related to natural gas transmission operations are critical to ensuring that natural gas continues to play a significant part of our Nation's domestic energy supply and portfolio. The current PCB regulations have proven effective at removing PCBs from the system and managing what trace amounts of PCBs remain. Most importantly, the EPA previously determined that the regulations ensure that PCBs in segments of the natural gas transmission pipeline system do not pose an unreasonable risk to human health or the environment, and no new evidence has emerged to the contrary.

The EPA's Regulations Governing PCBs Must Be Consistent with National Energy, Security, and Climate Change Policies

- Our national energy, security, and climate change policies each recognize the importance of natural gas as a clean, abundant and domestic fuel source.
- The current Mega Rule is consistent with our national energy, security, and climate change policies, as it allows natural gas transmission companies to transport natural gas safely and reliably, even if PCBs are present in the transmission system.
- The EPA's proposed changes to the Mega Rule are directly contrary to our national energy, security, and climate change policies, because, if adopted, they would have the unintended consequence of forcing transmission companies to shut down segments of the transmission system.

The Current Mega Rule Is Effective and Works as Intended

- Since TSCA, no new PCBs have been introduced into the natural gas transmission system.
- Under the current Mega Rule, transmission companies must remove PCBs from the system through, among other things, the removal of PCB-containing pipeline liquids.
- Most of the PCB mass in the transmission system as of the early 1980s has been removed. The remaining residual PCBs continue to be removed on an ongoing basis.
- Under the current Mega Rule, the EPA recognized that the natural gas transmission system, while not totally enclosed, is highly contained with limited exposure points.

- All potential access points in the transmission system are highly contained and highly regulated.
- The general public does not have access to underground or above-ground pipelines and pipeline facilities.
- The 50 ppm regulatory standard is based on principles of science and risk assessment.
- The EPA concluded that PCBs in the transmission system present no unreasonable risk of harm to health or the environment.

The EPA's Proposed Changes to the Mega Rule Violate Applicable Legal Standards

- Under the law, the EPA has the burden to justify a change to the existing regulations, which must be consistent with the authorizing statute, and cannot be arbitrary and capricious.
- The EPA has failed to justify its proposed changes to the Mega Rule, and its proposed changes are inconsistent with TSCA and are arbitrary and capricious.

Eliminating the Use Authorization for PCBs in Natural Gas Pipeline Systems Is Technically Infeasible and Economically Unreasonable

- The natural gas transmission system cannot operate without a use authorization for PCBs.
- Because of the persistent nature of PCBs and the complexity of the transmission system, PCBs cannot be "purged" from the system.
- Thus, in order to comply with the EPA's proposal, certain transmission companies would have to replace significant segments of the system, including underground pipelines, compressor stations and related equipment, at an unreasonable and exorbitant cost.
- The cost to replace significant segments of the transmission system ultimately would be borne by ratepayers.
- The microeconomic and macroeconomic impacts of the EPA's proposal are unreasonable.
- The replacement of the transmission system would result in decreased capacity, causing natural gas constraints and partial outages to major markets.

Lowering the Regulatory Standard to Below 50 ppm Is Technically Infeasible and Economically Unreasonable

- For many of the same reasons that it is impossible to eliminate PCBs from the natural gas transmission system, it is also impossible to lower the regulatory standard to a level below 50 ppm.
- While certain segments of the transmission system can be decontaminated, other segments of the system cannot. Despite all efforts to remove PCBs

from the transmission system, residual PCBs will remain in certain segments of the system for the foreseeable future. PCB concentration levels will also remain above 50 ppm in certain segments of the system for the foreseeable future.

- From a risk assessment perspective, there is no justification to lower the standard to less than 50 ppm, as PCBs in the transmission system present no unreasonable risk to health or the environment.

Increasing the Sampling Requirements Is Impractical and Unnecessary

- Under the current Mega Rule, transmission companies must collect samples from existing liquid collection points in classified zones, regardless whether those points are designed for individual or composite samples.
- The EPA's proposal to require transmission companies to collect individual samples instead of composites or accumulations is impractical. The EPA did not articulate a reason to justify this proposed change.
- Given the design and complexity of the transmission system, particularly at locations where there are multiple lines and cross-over of lines, and where the lines enter compressor stations, some liquid collection points, by necessity, are configured so that only composite samples can be collected.

Eliminating the Use Authorization for Air Compressor Systems and Changing the Use Authorization for Porous Surfaces Are Technically Infeasible and Economically Unreasonable

- The EPA did not articulate a reason to justify its proposal to eliminate the use authorization for air compressor systems.
- The EPA's statement in the ANPRM that transmission companies should have "purged" PCBs from the air compressor systems is inconsistent with the performance-based standards under the pre-Mega Rule Alternate Disposal Permit program and under the current Mega Rule.
- Moreover, given their design and complexity, it is technically infeasible to "purge" PCBs from air compressor systems.
- Therefore, transmission companies will be required to replace the air compressor systems that still contain PCBs, even though transmission companies had complied with the performance-based standards that did not require "purging" of PCBs from the air compressor systems.
- Further, PCBs in air compressor systems present no unreasonable risk to health or the environment. The cost to replace these air compressor systems, which still have a long useful life, is economically unreasonable.
- As with air compressor systems, the current Mega Rule has a performance-based standard to clean and encapsulate porous surfaces.

- The EPA questions the effectiveness of the performance-based standard for porous surfaces, without explaining or justifying its basis.
- The EPA previously acknowledged that cleaning and encapsulating porous surfaces protect health and the environment, and there currently exists no evidence to the contrary.
- Given the fact that air compressors are located on concrete pads subject to the porous surface use authorization, it is neither technically feasible nor economically reasonable to replace the porous surfaces. Nor is it necessary from a health perspective.

COMMENTS ON THE ADVANCE NOTICE OF PROPOSED RULEMAKING REGARDING THE REASSESSMENT OF USE AUTHORIZATIONS FOR PCBS

75 Federal Register 17,645, April 7, 2010

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EXECUTIVE SUMMARY

The Interstate Natural Gas Association of America (INGAA), a trade association of the interstate natural gas transmission industry, represents virtually all interstate natural gas transmission companies operating in the United States. There are approximately 160 pipeline companies in the United States, operating over 300,000 miles of pipe; approximately 200,000 miles of which are attributable to interstate transmission pipelines. INGAA member companies transport through these pipelines more than 85 percent of the Nation's natural gas, the cleanest burning fossil fuel available, to all sectors of the economy. Residences, businesses, schools, hospitals, factories, power plants, the government, the military, and almost every other type of institution count on the natural gas transmission industry to meet its deliverability obligations and demands every single day, without exception.

In the United States Environmental Protection Agency's (EPA) Advance Notice of Proposed Rulemaking (ANPRM), Polychlorinated Biphenyls (PCBs); Reassessment of Use Authorizations, published in the Federal Register on April 7, 2010, 75 Fed. Reg. 17,645, the EPA proposes to reassess certain PCB "use authorizations" under the Toxic Substances Control Act (TSCA). In the EPA's current PCB regulation, known as the Mega Rule, which became effective in 1998, the EPA granted use authorizations for PCBs in natural gas pipelines, air compressor systems and porous surfaces, among others. In this ANPRM, the EPA now is considering whether to eliminate or severely limit these use authorizations. INGAA and its members therefore have a direct interest in this ANPRM.

The EPA is specifically considering sweeping changes to the use authorization provisions that allow transmission companies to continue to operate with PCBs in their systems. The EPA's proposals include eliminating the use authorization for PCBs in natural gas pipeline systems by the year 2020, lowering the standard for the use authorization from 50 parts per million (ppm) to less than 1 ppm until the use authorization is eliminated in 2020, requiring transmission companies with PCB-impacted systems to institute engineering controls to meet the less than 1 ppm standard between now and 2020, increasing the reporting requirements, increasing the sampling requirements for pipeline liquids, eliminating or severely limiting the use authorization for air compressor systems, and overhauling the use authorization for porous surfaces. These proposals are impossible to achieve, both technically and economically.

INGAA appreciates the opportunity to comment on this ANPRM, and offers these comments with the intention of demonstrating the harsh economic and societal consequences of these amendments, if adopted by the EPA.

Overarching Policy Considerations

The EPA's rules governing PCBs in natural gas pipeline systems *must* be consistent with our Nation's energy, security and climate change policies. The current Mega Rule is consistent with each of these policies, as it allows natural gas pipelines to continue to operate safely and reliably, even if PCBs may be present in their systems. The EPA's proposals, however, are not consistent with any of these objectives, as eliminating the use authorizations or lowering the regulatory standard to less than 50 ppm of PCBs found in incidental pipeline liquids is impossible to achieve in certain significant segments of some transmission systems.[1] To be clear, these standards are both technically infeasible *and* economically unreasonable. To comply with the EPA's proposal, if adopted, transmission companies would be forced to remove and replace significant segments of their systems, including pipelines, compressor stations and other equipment, at exorbitant costs that ultimately would be passed on to ratepayers. Furthermore, because of the persistent nature of PCBs and how they migrate within pipeline systems, it is not even possible to replace individual segments of the systems over time, because the newly constructed segments would face the serious risk of being re-contaminated by the migration of PCBs from the existing impacted segments. Therefore, the unintended consequence of the EPA's proposal is that some transmission companies would be forced to shut down significant segments of their systems, including compressor stations, resulting in decreased pipeline capacity, higher delivered gas prices, partial outages and, in some markets, complete outages of natural gas service.

The vital role of natural gas in meeting our Nation's energy, security and climate change objectives cannot be understated. As the economy moves to reduce greenhouse gas (GHG) emissions and lessen its dependence on foreign oil, natural gas will continue to play a strategic role in our national energy portfolio. The role of natural gas in balancing energy demand, increasing energy security, and meeting environmental goals will endure because natural gas is a clean fuel source and its reserves in the United States and North America are abundant. Natural gas is widely used for commercial and residential heating purposes, and has been the fuel of choice for the vast majority of new electricity-generating power plants built in the United States over the last ten years.

Notably, the EPA recognized when it promulgated the Mega Rule in 1998 that if it were to discontinue the use authorization for PCBs in natural gas pipelines, "the system would have to cease operation until the PCBs were removed, burdening the public by making fuel more costly or unavailable." This fact was true in 1998, and is equally true today. Any impairment of the ability of natural gas transmission companies to deliver natural gas to local distribution companies, power plants and other customers runs contrary to our national energy policy, threatens our national security and conflicts with our climate change objectives, including the EPA's own climate change initiatives.

The Current Mega Rule Works as Intended and Should Remain in Effect

In straightforward terms, the Mega Rule works for two principal reasons: first, there is a substantial and ongoing reduction of PCB mass from the pipeline system, even in areas of the system where PCB concentration levels found in incidental pipeline liquids remain at or above 50 ppm, as no new PCBs have been introduced into the system and legacy PCBs are removed continuously from the system through liquid management practices; and second, there exists no

[1] Interstate natural gas pipelines transport "pipeline quality" natural gas in large diameter, high pressure, pipeline systems for customers. During transportation, incidental pipeline liquids are collected and removed from interstate pipeline facilities along the transportation route. Incidental pipeline liquids are lubricating oil, pipeline condensates, water and soluble debris. PCBs do not travel in the gas phase (63 Fed. Reg. at 35,395), but can exist in certain pipeline liquids.

unreasonable risk of harm to health or the environment, as transmission systems are contained, by both design and necessity, and the limited points in the system where there is potential access are well secured and highly regulated.

The Mega Rule authorizes the continued use of PCBs in pipeline systems at levels below 50 ppm, without conditions; it authorizes the continued operation of pipeline systems where concentrations are greater than or equal to 50 ppm, with conditions, including comprehensive sampling of pipeline liquids. In promulgating the rule, the EPA considered the risks presented by residual PCBs at this limit and determined that, when present below 50 ppm, PCBs do not present an unreasonable risk of injury to health or the environment. More importantly, the EPA recognized that concentrations of PCBs greater than or equal to 50 ppm in natural gas pipeline systems, given their design and configuration, present no unreasonable risk of injury to health or the environment. That determination remains valid today.

It also is important to emphasize that the natural gas transmission industry is one of the most highly regulated and controlled industries in the country. Thus, in addition to the EPA's regulatory oversight pursuant to the Mega Rule, multiple federal, state and local agencies oversee natural gas pipelines to protect their integrity, safety and security. Primarily, the Federal Energy Regulatory Commission (FERC), the Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Transportation and Security Administration (TSA) oversee distinct facets of natural gas pipeline systems, including pipeline siting and construction, pipeline operation and management, and pipeline safety and security. Through their extensive regulatory oversight, these agencies protect the general public and pipeline workers against potential hazards associated with pipeline operations and ensure that public access to the pipeline system is strictly prohibited.

Risk of exposure is reduced even further because, through well established management practices, substantial quantities of PCBs have been removed and continue to be removed from the system by disposing of pipeline liquids (pipeline liquid and water) from compressors, gate valves, mainline valves and other collection points and purging PCB-impacted equipment. Also, cleaning devices known as "pigs" are run through portions of the system which results in the collection of additional pipeline liquids. While the routine removal of liquids from these collection areas will continue to ensure the reduction of the total amount of PCBs in the natural gas pipeline system, any PCBs that remain in affected pipelines are managed in such a manner as to avoid exposure and to contain and prevent migration.

No new PCBs have been introduced into the pipeline system since the TSCA ban went into effect in the 1970s; large quantities of PCBs have since been removed from the system and continue to be removed through liquid management practices and other methods; the PCBs that remain in the system pose no unreasonable risk of health or the environment. The current Mega Rule therefore works as intended.

The EPA's Proposal to Eliminate the Use Authorizations Is Technically Infeasible and Economically Unreasonable

If the EPA either eliminates the use authorization or changes the existing regulatory standards for PCBs in natural gas pipelines, air compressors or porous surfaces, certain transmission companies will not be able to achieve compliance. Given the complexity of the U.S. pipeline network and the properties of PCBs, it is impossible to clean a pipeline system to a less than 1 ppm standard. It is not even possible to achieve the presently applicable 50 ppm standard in certain segments of some pipeline systems. Nonetheless, transmission companies continue to operate their pipeline systems in a safe and secure manner, and continue to meet their deliverability obligations to their customers by, among other things, complying with the specified conditions set forth in the use authorization provision of the Mega Rule.

Because the natural gas pipeline industry cannot "purge" PCBs from the system or reduce PCB concentrations in incidental pipeline liquids in the system to less than 1 ppm by the year 2020 or thereafter, the only way for transmission companies to attempt to meet the EPA's proposed standard would be to replace significant segments of their pipeline systems, including compressor stations, at exorbitant cost, which ultimately would be an unrealistic burden on ratepayers. Not only do existing pipelines and compression facilities continue to have a useful life, but the permitting procedures associated with their replacement also would place a heavy burden on the multiple federal, state and local agencies with relevant oversight. Replacing segments of the pipeline system cannot be accomplished by 2020 for obvious reasons, including regulatory restrictions imposed by multiple agencies, permitting limitations and requirements, regulatory agency resource limitations, land acquisition delays, constraints in materials procurement, construction standards, and economic considerations.

Further, the EPA has not cited to any source materials in the ANPRM to justify lowering the use authorization for the natural gas pipeline system to less than a 50 ppm standard based on principles of risk assessment and toxicology. There is neither a legal basis to lower the use authorization in the natural gas pipeline system to less than 50 ppm, nor is there a scientific or a practical basis to do so.

While the goal of the EPA's ANPRM is to protect humans from PCB exposure, replacing PCB-impacted segments of the pipeline system would have the opposite effect. Removing significant segments of the transmission system would disturb PCBs within the pipeline and may create genuine risks to health and the environment where none currently exist. The removal and replacement of the PCB-impacted pipelines would increase the risk to pipeline employees, construction contractors, the general public and the environment.

The EPA anticipated the increased costs and disruption of fuel supply that would result in the event that PCB-impacted pipelines were not authorized for continued use at the 50 ppm standard. In promulgating the Mega Rule, the EPA determined that the associated burden would outweigh any risk posed by allowing continued operations, provided that PCB-containing liquids are properly managed in accordance with the rule. The EPA's prior determination still is correct.

Conclusion

The presence of PCBs in certain segments of the natural gas transmission system, as currently managed under the Mega Rule, does not pose an unreasonable risk to health or the environment. The magnitude of any potential exposure is *de minimis*, and the economic consequences of eliminating the use authorization would cripple the natural gas industry and severely impact its ability to deliver gas to markets throughout the country. The inability of the natural gas industry to meet its deliverability obligations is inconsistent with our Nation's energy, security and climate change policies. The EPA previously acknowledged that the risk factors associated with PCBs in natural gas pipelines do not justify the anticipated burden on industry or society; the EPA has not presented any justification to amend its prior position. Accordingly, the EPA must maintain the current use authorization for the natural gas pipeline system at the present regulatory standard of 50 ppm.

I. INTRODUCTION

The Interstate Natural Gas Association of America (INGAA), a trade association of the interstate natural gas transmission industry, represents virtually all interstate natural gas transmission companies operating in the United States. INGAA's primary mission is to work closely with the executive and legislative branches of the federal government, including federal regulatory agencies, to advocate positions of importance to the interstate natural gas transmission industry, such as economic, operational, engineering, environmental, safety, and security matters. There are approximately 160 pipeline companies in the United States, operating over 300,000 miles of pipe; approximately 200,000 miles of which are attributable to interstate pipelines. INGAA member companies transport through these pipelines more than 85 percent of the Nation's natural gas, the cleanest burning fossil fuel available, to all sectors of the economy.

The United States Environmental Protection Agency's (EPA) Advance Notice of Proposed Rulemaking (ANPRM), Polychlorinated Biphenyls (PCBs); Reassessment of Use Authorizations, published in the Federal Register on April 7, 2010, 75 Fed. Reg. 17,645, proposes to reassess the PCB use authorizations under the Toxic Substances Control Act (TSCA),[2] including eliminating of the use authorization for PCBs in natural gas pipelines, eliminating or significantly limiting of the use authorization for air compressor systems, and drastically changing the use authorization for PCBs in porous surfaces. INGAA appreciates the opportunity to comment on this ANPRM, and offers these comments with the intention of demonstrating the harsh economic, environmental and societal impacts these amendments, if adopted, will have on the natural gas pipeline industry and on natural gas consumers.

[2] 15 U.S.C. § 2601 *et seq.*

Under the current PCB regulations, known as the PCB Mega Rule (Mega Rule),[3] the EPA granted a use authorization for PCBs present in natural gas pipelines. At the time the EPA adopted the Mega Rule, it specifically concluded that the use authorization for PCBs in natural gas pipelines does not present an unreasonable risk to health or the environment. Nothing has changed to render that conclusion inaccurate.

Within the framework of the Mega Rule, and the Compliance Monitoring Program (CMP) that preceded the Mega Rule, natural gas transmission companies have systematically prevented human exposures and releases of PCBs into the environment and removed the overwhelming majority of PCBs from the pipeline system.[4] With regard to the fractional amount of PCBs that still remain in the system, natural gas pipeline companies have reduced PCB concentration levels over time in most affected parts of the system through the removal of liquids, and are continuing to remove those PCBs from the system on a regular basis.[5] There are segments of the pipeline system that continue to be impacted by PCBs at concentrations equal to or greater than 50 ppm; sections of which cannot be reduced to less than 50 ppm by 2020, much less 1 ppm as the EPA is considering.

Of critical importance, there are only limited points in the pipeline system in which PCB exposure is even remotely possible.[6] Access to these points by the public is restricted,

[3] Disposal of PCBs, 63 Fed. Reg. 35,383 (June 29, 1998) (codified at 40 C.F.R. Parts 750 and 761).
[4] *See* discussion at Part IV, *infra*. See S.S. Papadopulos & Associates, Inc. (SSPA), PCBs in the Interstate Natural Gas Transmission System – Status and Trends 15, 19 (Aug. 2010).
[5] Memoranda from M. Calhoun, EPA, Regarding the 1996 Revision to the 1981 CMP, the Approval of 9 Revised Natural Gas Pipeline PCB CMP Plans, and the Approval of Enron/Transwestern Revised Natural Gas Pipeline PCB CMP Plan, http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/guidance.htm [hereinafter "Calhoun Memos"]; *see* SSPA, *supra* note 4, at s. 5.
[6] *See* discussion at Part IV.E, *infra*. Pipeline Knowledge & Development (PkD), The Interstate Natural Gas Transmission System: Scale, Physical Complexity, and Business Model 33 (Aug. 2010) ("Pipelines operate under pressure and are therefore inherently closed systems, so the general public is not exposed to pipeline liquids under normal operating conditions.").

controlled, and regulated by multiple agencies through detailed and overlapping regulations.[7] The current status of PCBs in the interstate natural gas pipeline system—contained and reducing— does not pose an unreasonable risk to human health and the environment.

Given the industry's success in removing PCBs from the affected portions of the pipeline system, and given that there is no unreasonable risk of harm with regard to the PCBs that remain in the system, the provisions of the Mega Rule that apply to the natural gas pipeline industry are unquestionably effective, work as intended and need not be changed. In promulgating the Mega Rule, the EPA evaluated the risk factors and concluded, as a matter of public record, that PCBs in natural gas pipelines, air compressor systems and porous surfaces do not present an "unreasonable risk of injury to health or the environment."[8] Recognizing the importance of providing natural gas to our citizens and all sectors of our economy, the EPA also acknowledged that, despite the presence of legacy PCBs in the system, natural gas pipelines must continue to operate.[9] In light of these facts, the EPA would need to present significant new information, taking into account risk factors, technical feasibility and economic reasonableness, to justify any change in its prior position. The EPA has not done so.

In the ANPRM, despite failing to articulate any reason to justify a change from its prior position to allow pipelines to operate with PCBs at levels greater than or equal to 50 ppm, subject to extensive sampling of pipeline liquids, the EPA is proposing to eliminate the use authorization for PCBs in natural gas pipeline systems by 2020, to lower the standard between now and 2020 to 1 ppm, to change the sampling requirements from composite to individual, and

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[7] *See* discussion at Parts IV.D, E, *infra*; PkD, *supra* note 6, at 3, 22.

[8] Under TSCA, the EPA may only establish a PCB use authorization upon a finding of no unreasonable risk. 15 U.S.C. § 2605(e)(2)(B). Indeed, the EPA has stated that it will only grant a use authorization if there is "clear evidence" to support that no unreasonable risk would result. EPA, Voluntary Draft Environmental Impact Statement for PCB Manufacturing, Processing, Distribution in Commerce and Use Ban Regulation 42 (May 1978).

[9] 63 Fed. Reg. at 35,396.

to change the reporting requirements. The EPA also is proposing to eliminate the use authorization for air compressor systems and to change the use authorization for porous surfaces, again without justification. As will be demonstrated below, these proposals are technically infeasible and economically unreasonable. Simply put, the persistent nature of PCBs, coupled with the complexity of the equipment used in the pipeline system, render it impossible to purge all PCBs from the entire pipeline system on a mandated timeline.[10] Because pipeline companies would be unable to reduce PCB concentrations below 1 ppm, if the EPA adopts the ANPRM as proposed, pipeline companies would be forced to replace thousands of miles of pipeline, numerous compressor stations, air compressor systems, concrete pads and other equipment to meet the EPA's proposed standard. The replacement of the system on such a massive scale would not only cost an astronomical sum that would be passed on to ratepayers through pipeline transportation rates, but also would jeopardize our Nation's energy capacity, resulting in natural gas outages, higher delivered energy prices, higher manufacturing costs (for goods that rely on natural gas to run plants and manufacture goods), and threaten our national security.[11]

The unintended consequence of the EPA's proposal to eliminate the use authorizations for PCBs in pipelines, air compressor systems and porous surfaces is that it would create genuine risks to health and the environment, where none currently exist. These include risks to pipeline workers, contractors and the general public associated with the replacement of pipelines, compressor stations and other equipment.[12] Further, by hindering industry's ability to deliver natural gas to residences, businesses, hospitals, schools and other institutions, health and safety risks would arise during periods of decreased capacity while the system is being replaced.

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[10] *See* discussion at Parts VI, VII, *infra*; SSPA, *supra* note 4, at s. 7.
[11] *See* Analysis Group Inc., The Costs of Compliance to EPA's Advance Notice of Proposed Rulemaking on the PCB Use Authorization for Interstate Natural Gas Pipelines 19, 22, 24-33 (Aug. 2010).
[12] Exponent Inc., Risk Assessment and Risk Management of PCBs in Gas Transmission Lines, at s. 6 (Aug. 2010).

II. PROMINENT NATURAL GAS PIPELINE INDUSTRY EXPERTS SUBSTANTIATE THAT THE EPA'S PROPOSALS ARE TECHNICALLY INFEASIBLE AND ECONOMICALLY UNREASONABLE

INGAA's comments to the EPA's ANPRM are in large part founded on the collective experience, knowledge, and expertise of its constituent members. Altogether, INGAA's membership represents many decades of practical, hands-on experience dealing with those isolated segments of the interstate natural gas transmission system that were impacted by PCBs. While there is well-settled information in the public domain regarding the behavior of PCBs in natural gas pipelines establishing that they do not pose an unreasonable risk of harm, INGAA has asked several prominent experts to develop "White Papers" to supplement its own knowledge and experience and to help explain why eliminating the use authorization or lowering the standard for PCBs in pipeline systems is a technical and economic impossibility. INGAA adopts and appends these white papers to its comments.

- Pipeline Knowledge & Development, under the primary authorship of Thomas Miesner, has prepared a paper entitled *The Interstate Natural Gas Transmission System: Scale, Physical Complexity, and Business Model*. This paper explains the complex, highly contained and highly regulated nature of the interstate natural gas pipeline system. By reviewing the complexity of the fundamental elements of the pipeline system, the paper demonstrates why, short of component replacement, purging PCBs from the system is technically impossible. It also discusses the very limited number of potential access points to the transmission system, which do not result in an unreasonable risk to health or the environment.

- S.S. Papadopulos & Associates, Inc., under the primary authorship of Dr. Remy Hennet, has prepared a paper entitled *PCBs in the Interstate Natural Gas Transmission System – Status and Trends*. Dr. Hennet reviews the relevant history of PCBs and their use in interstate pipeline systems and discusses the way in which PCBs can migrate within pipelines. The paper also documents the transmission industry's extraordinary success in removing PCBs and reducing PCB concentrations from the system since the 1980s, and establishes that the effectiveness of decontamination efforts ultimately is limited since low-levels of PCB residuals can never be purged completely from the system. By establishing the substantial and continuing reductions in PCBs achieved under the CMP and the Mega Rule, Dr.

Hennet's paper supports the proposition that the current use authorization for PCBs in natural gas pipelines does not require revision.

- Exponent Inc. has prepared a paper, primarily authored by Charles Menzie *et al.*, entitled *Risk Assessment and Risk Management of PCBs in Gas Transmission Lines*. Exponent's paper focuses on the limited exposure risk to pipeline employees, the group most directly affected by the presence of PCBs in natural gas pipelines, demonstrating that the risk of exposure has declined over time, ultimately is negligible and that the current use authorization adequately protects the health and the environment.

- ENVIRON International Corp. has prepared a paper, authored by Michael Scott, entitled *White Paper on EPA's Proposed Changes to the Use Authorization for PCBs in Air Compressor Systems: A Natural Gas Transmission Perspective*. The paper examines the use authorization currently in place for air compressor systems used in natural gas pipeline operations, establishing the industry's historic compliance with past and present decontamination protocol and the technical infeasibility of increasing the stringency of required decontamination efforts. The paper also notes the potential cost to remove and replace entire compressor systems and demonstrates that the continued presence of PCBs in these systems does not present an unreasonable risk to health or the environment.

- Analysis Group Inc., with Drs. Susan Tierney and Robert Earle as the lead authors, has prepared a paper entitled *The Costs of Compliance to EPA's Advance Notice of Proposed Rulemaking on the PCB Use Authorization for Interstate Natural Gas Pipelines*. Dr. Tierney recently was appointed by Secretary of Energy Steven Chu to serve on the Secretary of Energy Advisory Board, and in that capacity she will advise the Secretary on economic and national security policy, among other issues. The Analysis Group paper reviews the *micro*economic effects that would result if the EPA were to revise the use authorization for natural gas pipelines as contemplated and concludes that the effect on the natural gas pipeline industry would be severe and the associated costs also would adversely impact industrial users, local distribution companies, and power plants.

III. OVERARCHING POLICY CONSIDERATIONS

A. The EPA's Regulations Governing PCBs Must Be Consistent with National Energy and Security Policy

United States energy policy promotes the development and expansion of domestic sources of energy, including natural gas, to ensure a supply of energy that is affordable, reliable and adequate to meet the needs of our growing national economy. In addition, excessive reliance on foreign energy sources presents national security concerns and, thus, there is a desire for the

United States to be energy independent. Our Nation's energy policy is aligned closely with national security interests.

Natural gas is a critical domestic energy source which helps to meet our Nation's energy needs. The United States has abundant supplies of this readily available, domestic, and versatile fuel source, which can help stabilize prices so that energy remains relatively inexpensive, which in turn supports economic stability and growth and promotes critical national security interests. According to the Energy Information Administration (EIA), natural gas accounted for 24.4 percent of United States energy consumption in 2008.[13] Proven domestic reserves of natural gas are rapidly increasing,[14] and thus that percentage is expected to grow over the near to midterm. According to the U.S. Department of Energy (DOE), approximately 90 percent of new domestic power plants will be powered by natural gas.[15] The necessary infrastructure must be put in place to meet this growing demand—in fact, the EIA projects vigorous pipeline construction activity over the next several years, particularly with respect to the interstate natural gas pipeline network.[16] These infrastructure requirements are supported further by a white paper prepared by ICF International for The INGAA Foundation, Inc., *Natural Gas Pipeline and Storage Infrastructure Projections Through 2030*. The study concludes that the United States and Canada will need approximately 29,000 to 62,000 miles of additional natural gas pipelines and 370 to 600 billion cubic feet (Bcf) of additional storage capacity in order to accommodate market requirements. In addition, ICF anticipates that such infrastructure investment requirements

[13] DOE/EIA, Monthly Energy Overview (Aug. 2009).
[14] U.S. Department of State, U.S. Climate Action Report, at 13 (Jan. 2010) [hereinafter "2010 Climate Action Report"].
[15] DOE, Natural Gas, http://www.energy.gov/energysources/naturalgas.htm; *see also* Analysis Group, *supra* note 11, at 10 (noting that virtually all non-renewable power plant capacity added since 2000 is natural gas-fired).
[16] EIA, Expansion of the U.S. Natural Gas Pipeline Network: Additions in 2008 and Projects through 2011, at 3 (Sept. 2009).

under various market scenarios will range from $133 to $210 billion over the next 20 years (between $6 and $10 billion per year). ICF further concludes that insufficient infrastructure development could lead to price volatility, reduced economic growth and diminished delivery of gas to supply to customers who need it most.[17]

The use authorization for natural gas pipelines is essential to support our Nation's energy policy and security objectives—this is why the ANPRM is of particular concern. In promulgating the Mega Rule, the EPA recognized that discontinuation of the use authorization for natural gas pipelines would require that the system "cease operation until the PCBs were removed, burdening the public by making fuel more costly or unavailable."[18] This conclusion remains true today. The EPA's proposal to eliminate the PCB use authorization for natural gas pipelines would force the replacement of large segments of the pipeline system, including compressor stations, and force the temporary shutdown of large portions of the nationwide transmission system, causing significant disruptions to energy supply.

B. The EPA's Regulations Governing PCBs Must Be Consistent with Emerging National Climate Change and Clean Energy Policies

Climate change is a significant policy concern for the United States. Although the Congress has not passed legislation that would cap or otherwise mandate the reduction of greenhouse gas (GHG) emissions, federal agencies are addressing climate change by directly regulating or providing business incentives through approximately 80 different energy policies and measures that promote, among other initiatives, energy efficiency and clean technologies.[19] States also are taking aggressive actions to curb GHG emissions through a number of programs.

[17] ICF International, Inc., Natural Gas Pipeline and Storage Infrastructure Projections Through 2030 (Oct. 2009), *available at* http://www.ingaa.org/?ID=7828.
[18] 63 Fed. Reg. at 35,396.
[19] *See generally* 2010 Climate Action Report, *supra* note 14.

For example, in a collaborative effort of the Regional Greenhouse Gas Initiative (RGGI), thirteen northeastern states have implemented a comprehensive program to attempt to reduce emissions of GHGs from electric generators.

Both the federal government and states are looking for opportunities to reduce GHG emissions. While alternative energy sources have not yet been developed in the United States to the extent sufficient to replace fossil fuel generation, natural gas is an abundant and clean-burning fuel source and is readily available through the established network of pipelines. Natural gas is widely expected to play a significant role as we move into a low carbon society that, in the foreseeable future, will consist of natural gas, energy efficiency and renewable resources. The successful transition to greater use of renewables, such as wind and solar, will depend on natural gas as a reliable backup fuel source when the wind does not blow and the sun does not shine. Therefore, natural gas will continue to be part of the solution in meeting objectives to reduce GHGs in the United States, and natural gas will be a key component of any successful national climate change policy. This important role, along with the likelihood of reducing GHG emissions, would be jeopardized should the EPA decide to adopt onerous new regulatory requirements that disrupt the steady supply of natural gas.

IV. AS APPLIED TO THE NATURAL GAS PIPELINE INDUSTRY, THE CURRENT MEGA RULE IS EFFECTIVE, WORKS AS INTENDED AND SHOULD NOT BE CHANGED

A. Natural Gas Pipeline Systems Are Highly Complex, Well-Managed, and Highly Controlled to Ensure Reliability, Deliverability, Efficiency and Safety

1. Complexity of the Natural Gas Transmission System

The natural gas transmission system is an extensive and extremely complex network of pipelines and compressor stations, with numerous other appurtenant facilities. These complex systems interconnect in numerous places and are designed, by necessity, for continuous operation.[20] Consequently, the components of the interstate pipeline network, including pipelines, compressor stations, meter stations, hubs and interconnects, have enduring useful lives and are long-lived assets. Indeed, with proper maintenance, original pipeline equipment can be maintained and used efficiently and effectively for many years and can be repaired and retrofitted in lieu of complete replacement.[21]

In contrast to low-pressure distribution systems that deliver natural gas to commercial and residential end consumers through small-diameter pipelines, high-pressure transmission pipelines, which include approximately 300,000 miles of interstate and intrastate pipeline, deliver gas to customers, including local distribution companies (LDCs), power plants, large industrial facilities, large agricultural facilities and municipalities, in large diameter "mainline" pipes. Transmission systems may have one "single-barrel" pipeline or multiple "looped" lines that run parallel to one another. Most, if not all, interstate natural gas pipelines interconnect with multiple other pipelines (transmission and customer) at hubs, gates and other interconnect facilities.[22]

Compressor stations are located at approximately 50 to 100 mile intervals along the system to compress the natural gas molecules and to keep the natural gas flowing by boosting the pressure of the gas to compensate for pressure losses along the line. There are roughly 1,400 gas compression stations (many with multiple compressors at each station) in use throughout the

[20] Such equipment and components include, but are not limited to, piping, coatings, valves, compressors, drivers, meters, actuators, cathodic protection and control equipment and ancillary systems. PkD, *supra* note 6, at 24.
[21] *See* PkD, *supra* note 6, at 1, 38. Some natural gas pipelines and compressor units are over 40 years old, and are routinely maintained and repaired to ensure efficiency and reliability. As a result, equipment used in the natural gas transmission system is not subject to the EPA's concerns regarding attrition, aging of equipment or spills associated with electrical equipment. 75 Fed. Reg. at 17,650.
[22] *See* PkD, *supra* note 6, at 13-14.

natural gas transmission system.[23] Because the natural gas pipeline system is the "vehicle" by which natural gas, a valuable and essential commodity, is transported under extremely high pressures across the entire country, the pipeline system is, by necessity, highly contained.

Valves are installed along the highly interconnected interstate pipeline system at regular intervals to control gas flow. Gas flow, temperature and pressure are monitored at compressor stations, valves and other locations via sophisticated computer systems, and this information is relayed in real-time to pipeline operators, who can respond quickly to potential disruptions along the line.[24] Not only is the system designed and constructed to ensure that the natural gas, and liquids that condense within the pipeline, are contained in the system and effectively managed, but pipeline operators have every incentive to ensure that pipeline equipment is maintained properly, the pipeline system operates safely and reliably under pressure, and anomalies are identified early and remedied quickly.

Points of access to critical components of the natural gas transmission system, such as those points where routine maintenance activities are performed, are highly secured and monitored. This is required both as a matter of operational security, but, as discussed below, a matter of regulatory requirement. As a result, the public does not have access to facilities housing important and highly complex components of the natural gas transmission system.[25]

Interstate natural gas transmission lines are designed to move gas efficiently, safely, and reliably across thousands of miles, with little to no loss of product. As a result, the interstate natural gas transmission system is highly controlled and highly contained.

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[23] PkD, *supra* note 6, at 4.
[24] PkD, *supra* note 6, at 37; EIA, Natural Gas Pipeline Network, Transportation Process & Flow, http://www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/process.html.
[25] *See, e.g.*, PkD, *supra* note 6, at 3, 22.

2. Formation and Removal of Pipeline Liquids

Natural gas is composed almost entirely of methane. However, the gas stream often contains minor amounts of other heavier hydrocarbons such as butane, propane, and ethane, and even smaller amounts of water vapor. While methane remains a gas at pipeline temperatures and pressures, heavier hydrocarbons and water vapors may "drop out" as hydrocarbon and water liquids when there is a decrease in gas temperature. These pipeline liquids sometimes also contain fractional amounts of pipeline system lubricants used to lubricate mechanical compressors.[26]

The presence of liquids significantly affects the quality of the gas and can cause extensive damage to compressor systems and to customer equipment, as well as reduce transmission efficiency because of the friction they create within a pipeline. Thus, a principal objective of routine pipeline system operations is to remove as much of these liquids as possible. To protect gas compression stations from damage resulting from liquids that accumulate in the lines, pipeline companies employ gas dryers and liquid separators, such as scrubbers, filters and drips, to remove water and hydrocarbons that have condensed from the gas stream.[27] INGAA addresses more extensively the general practices many transmission companies employ to manage pipeline liquids in Part IV.D of these comments. Liquids management and removal is a critical issue for the industry and pipeline companies typically devote considerable resources to ensure that they are controlling liquids as efficiently as possible throughout their systems.

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[26] *See* PkD, *supra* note 6, at 4.
[27] PkD, *supra* note 6, at 15, 31-32.

B. Certain Pipeline Companies Used PCB-Containing Products in Their Pipeline Systems Before PCBs Were Banned in the 1970s

As early as 1929, PCBs were produced commercially and used for their chemical stability and fire resistance in a wide variety of commercial and industrial applications, including in dielectric fluids, heat transfer fluids, paints, caulks, adhesives and plastics, among others.[28] It was not until the late 1950s that some pipeline companies began using lubricating oils that contained PCBs in their turbines and centrifugal compressors and air compressor systems.[29] Certain seals and gaskets used in pipeline operations also contained PCBs.[30] As the potential hazards of PCBs became widely acknowledged in the 1960s and early 1970s, pipelines began to phase-out PCB lubricating oils from their pipeline and air compressor systems. Not until 1991 was INGAA made aware that certain valve sealants manufactured by Rockwell International contained PCBs. As the EPA recognized, some pipeline companies do not have any records that PCB-containing lubricating oils or valve sealants were used in their systems, and therefore cannot be sure of the source of the PCBs in their systems.[31]

C. PCBs Were Banned with the Passage of TSCA

In 1976, Congress passed TSCA, which granted the EPA broad authority to regulate the manufacture, import, use and disposal of toxic chemicals in the United States. Section 6 of TSCA required the EPA to develop regulations addressing PCBs.[32] At a minimum, the EPA was required to promulgate rules addressing the disposal of PCBs and marking of PCBs "with clear

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[28] SSPA, *supra* note 4, at 5, 6.
[29] Exponent, *supra* note 12, at s. 2.
[30] The main PCB products that were used in interstate pipelines were formulated with Aroclors 1242 and 1248 (i.e., gas compressors and drivers), Aroclor 1254 (i.e., air compressors), Aroclor 1260, and Aroclor 1268 (i.e., valve sealant). SSPA, *supra* note 4, at s. 2. PCBs also were used to a limited extent in the wrap materials for buried pipelines. In these applications, however, PCBs remain stable, do not migrate in the soil and while buried do not present any exposure risk to health or the environment.
[31] 63 Fed. Reg. at 35,395.
[32] *Id.* § 2605(e)(1).

and adequate warnings."[33] Otherwise, TSCA banned the manufacture, processing, distribution and use of PCBs, except where used in a totally enclosed manner.

Notwithstanding the general use prohibition, Congress provided the EPA authority under TSCA to grant specific authorizations for *non*-totally enclosed uses of PCBs, provided that the EPA finds that such uses do not present "an unreasonable risk of injury to health or the environment."[34] The EPA developed "use authorizations" to cover certain general and legacy applications of PCBs, which include specific authorizations for PCBs to remain in the interstate natural gas pipeline system's piping, equipment and components.[35] The EPA also developed comprehensive regulations addressing standards for the storage, marking, remediation, disposal, and incineration of PCBs.[36]

1. Development of the 50 ppm Standard for Concentrations of PCBs

In promulgating the "Ban Rule" in 1979, the EPA first established 50 ppm as the regulatory standard for concentrations of PCBs.[37] Through this rule, the EPA proposed to implement the PCB ban under TSCA and restrict, with limited exceptions, the manufacturing, processing, distribution in commerce and use of PCBs. With certain specific exceptions, the EPA intended that products and mixtures containing PCB concentrations below 50 ppm would not be regulated and defined "PCBs" to mean only those concentrations at or above 50 ppm.[38]

The 1979 Ban Rule, including the rule's 50 ppm standard, was later struck by the U.S. Court of Appeals for the D.C. Circuit. The court rejected the EPA's reliance on what it called

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[33] *Id.*
[34] *Id.* § 2605(e)(2)(B).
[35] While these comments refer to the "use" of PCBs in natural gas pipeline systems, the reality is that natural gas pipeline systems, unlike transformers and other equipment, do not derive any useful benefit from the PCBs in the system. Rather, the residual PCBs are still present in certain segments of the pipeline system as a result of historic use.
[36] *See generally* 40 C.F.R. Part 761.
[37] 44 Fed. Reg. 31,514 (May 31, 1979).
[38] 44 Fed. Reg. at 31,516.

the "*ad hoc* consideration of economic impact and disposal requirements" and remanded the rule to the agency for further consideration.[39] In response, the EPA revised the Ban Rule in 1984.[40] The EPA prepared a Final Report entitled, "Exposure Assessment for Polychlorinated Biphenyls (PCBs): Incidental Production, Recycling, and Selected Authorized Uses," in which the EPA performed a detailed risk assessment, including an assessment of PCBs in natural gas pipeline systems.[41] The EPA acknowledged that a natural gas pipeline system is a closed system with limited exposure points and, therefore, found it appropriate to consider the risks to pipeline workers who handle PCB-containing liquids and equipment. The EPA concluded that there is no unreasonable risk to these pipeline workers, either through dermal contact or inhalation, at concentrations below 50 ppm. The EPA also considered risks to consumers as a result of potential exposure to PCBs through indoor appliances, including the burners of a gas range, and again concluded that there is no unreasonable risk to residential consumers.[42] The EPA admitted that "[t]he authorization of the use of PCBs in compressors and in the liquids of natural gas pipelines at a concentration level of less than 50 ppm would adequately safeguard workers and consumers from risk to human health."[43] The EPA thus maintained the 50 ppm standard for PCB concentrations in the face of judicial scrutiny, demonstrating through a scientific and risk-based assessment, at least with respect to their presence in natural gas pipeline systems, that PCBs at this concentration pose no unreasonable risk to health or the environment.[44]

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[39] *Env. Def. Fund v. Env. Prot. Agency*, 636 F. 2d 1267, 1284 (D.C. Cir. 1980).
[40] 49 Fed. Reg. 28,172, 28,186 (July 10, 1984).
[41] EPA, Exposure Assessment for Polychlorinated Biphenyls (PCBs): Incidental Production, Recycling, and Selected Authorized Uses, at Attachment Z (May 2, 1984) [hereinafter "EPA, 1984 Exposure Assessment"].
[42] 49 Fed. Reg. at 28,186; *see also* EPA, 1984 Exposure Assessment, *supra* note 41; New York Department of Health, An Assessment of the Possible Impact of Natural Gas Use on PCB Levels in Indoor Air (April 1982) [hereinafter "New York Indoor Air Study"]; Exponent, *supra* note 12, at 25-29.
[43] 49 Fed. Reg. at 28,186.
[44] This is in direct contrast to the EPA's suggestion in the ANPRM that the 50 ppm level used in the PCB regulations historically is based "almost entirely on economic considerations." 75 Fed. Reg. at 17,658

2. Compliance Monitoring Program

In January 1981, PCBs were discovered in a natural gas pipeline distribution system in Long Island, New York.[45] To determine the extent to which PCBs may have impacted pipeline systems, the EPA and the interstate transmission industry initiated an extensive cooperative program requiring all natural gas transmission companies across the United States to sample and characterize their systems. The EPA concluded that 13 of the 24 major transmission companies at that time had PCBs in incidental pipeline liquids in their systems at concentrations greater than 50 ppm.[46]

In response to these findings, the EPA established later that year the Compliance Monitoring Program (CMP), which authorized the continued use of PCBs by these 13 companies in exchange for their commitment to develop plans to, among other things, contain the PCBs to limited areas of the transmission system.[47] In 1983, three of the original 13 companies were released successfully from the CMP program, as their PCB levels were found to have dropped below 50 ppm.[48] As discussed above, the EPA revised the PCB regulations again in 1984 to authorize the unrestricted presence of PCBs in affected natural gas pipelines at concentrations below 50 ppm, as the EPA had determined, based on principles of science and risk assessment, that the presence of such PCBs in the pipeline system does not present an unreasonable risk to health and the environment.[49]

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[45] Calhoun Memos, *supra* note 5; EPA, Polychlorinated Biphenyl Inspection Manual, Appx. G (Aug. 2004) ("PCBs in Natural Gas Pipelines"). A study was later performed by natural gas utilities in New York under the direction of the New York Department of Health, Bureau of Toxic Substance Assessment. This study demonstrated no significant difference in PCB levels between houses using natural gas and control houses. New York Indoor Air Study, *supra* note 42.
[46] Calhoun Memos, *supra* note 5.
[47] *Id.*
[48] *Id.*
[49] *Id.*; 49 Fed. Reg. at 28,186. By authorizing use of PCBs below 50 ppm in 1984, the EPA acknowledged that use at this level would not pose an unreasonable risk to health or the environment.

In 1996, the EPA revised the CMP for the ten remaining companies in the program, including changing the reporting requirements from bi-annual to annual.[50] Notably, the EPA issued a series of memoranda in 1996 addressing the successes that the natural gas pipeline industry achieved under the CMP. The EPA noted that, as of that time, companies with PCB-impacted pipelines had removed approximately 4 million gallons of PCB-containing liquids from the pipeline system.[51]

3. The Mega Rule

In 1998, the EPA promulgated sweeping revisions to its then existing PCB regulations, which became known as the "Mega Rule."[52] In the Preamble to the Mega Rule, the EPA acknowledged that "[m]uch progress has been made in reducing PCB concentrations in natural gas pipelines under the [CMP]."[53] The Mega Rule effectively codified a 20-year body of agency policy on PCBs, including the establishment of a use authorization for PCB concentrations at or above 50 ppm found in incidental pipeline liquids in natural gas pipelines.[54]

Under the use authorization for natural gas pipeline systems in the Mega Rule, PCBs are authorized for use in natural gas pipeline systems at concentrations under 50 ppm, without conditions. The EPA also authorized the use of PCBs at or above 50 ppm, provided that natural gas pipeline companies: (1) characterize the segments of their system where the pipeline liquid contains PCB concentrations at or above 50 ppm; (2) take annual samples at liquid collection points in the classified zones; (3) take steps to reduce concentrations to less than 50 ppm or eliminate PCBs from their system; and (4) mark all above-ground sources of PCBs at or above a

[50] Calhoun Memos, *supra* note 5.
[51] *Id.*
[52] 63 Fed. Reg. at 35,384.
[53] 63 Fed. Reg. at 35,397.
[54] 40 C.F.R. § 761.30(i). Again, pursuant to TSCA, establishing this authorized use evidences EPA's determination that such use would not pose an unreasonable risk of injury to health or the environment.

concentration of 50 ppm.[55] The Mega Rule also established performance-based standards to address PCBs in air compressor systems and porous surfaces.[56] The EPA determined that the continued use of PCBs in impacted natural gas pipeline systems at concentrations above 50 ppm, as well as the continued use of PCBs in air compressor systems and porous surfaces, does not present an unreasonable risk of injury to health or the environment.[57] "As with natural gas pipeline systems, EPA believes that allowing continued use of the air compressor system while the PCBs are being removed does not pose an unreasonable risk, so long as the PCBs are contained in the system, are regularly removed in the condensate, and, when removed, are stored and disposed of in accordance with these regulations."[58]

D. The Current Mega Rule Ensures that PCBs in the Natural Gas Pipeline System Are Effectively Managed and Controlled

The existing Mega Rule, as it specifically relates to the presence of residual PCBs in natural gas pipeline systems, has been a very effective tool for removing legacy PCB mass from impacted segments of the natural gas transmission system. The requirements under the Mega Rule continue to effectively minimize the risk of exposure to, and to manage and reduce the presence of, those increasingly small amounts of residual PCBs that do remain in certain pipeline segments. Pipeline companies with PCB-impacted segments routinely use a number of management practices to reduce PCB mass in the pipeline system and to contain potential migration in accordance with the current PCB use authorization.[59] These practices have been implemented where appropriate. Depending on variances in system configurations and

[55] *Id.* § 761.30(i)(1)(iii).
[56] 63 Fed. Reg. at 35,445, 35,399; 40 C.F.R. § 761.30(s), (p).
[57] 63 Fed. Reg. at 35,395-97.
[58] *Id.* at 35,399.
[59] PkD, *supra* note 6, at 1, 29-33.

functions, particular practices may vary from system to system. Several general practices, however, are common to most pipeline companies.[60]

As the EPA has recognized, PCBs move through the pipeline system in pipeline liquids.[61] It is well documented that PCBs do not move through the pipeline system in the gas phase.[62] PCBs also do not travel as aerosols (very small liquid droplets that can remain suspended in the gas stream) at any level of consequence. The condensate fraction of liquid aerosols, however, is not stable outside of the lower temperature areas along the pipeline and will dissipate at temperatures higher than the dew point. Upon evaporation of the condensate fraction, any PCBs associated with the aerosols will again become immobilized. Because PCBs move through the pipeline system in the liquids, the key to effective and proper PCB management in natural gas pipeline systems is therefore the management of incidental pipeline liquids, a fact recognized by the EPA.[63] As discussed above, it is an operational imperative for pipelines to collect and manage liquids since they interfere with proper operation of the pipeline. Accordingly, routine pipeline operations already lend themselves naturally to efficiently achieving the reductions of PCB mass intended under the current regulations.

Historically, many natural gas pipeline companies with impacted pipelines developed and submitted PCB liquid removal plans to the EPA for approval. These plans (as well as the subsequent use authorization provisions of the Mega Rule) required the installation of various engineering controls and equipment at specified locations to remove PCB-containing liquids. Several controls are available and widely used in the industry, including filters, separators,

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[60] *Id.*
[61] "PCBs primarily move with the condensate liquids that form in the pipelines." 63 Fed. Reg. at 35,395; *see also* SSPA, *supra* note 4, at s. 4 (discussing transport of PCBs in the interstate natural gas transmission system).
[62] *See* SSPA, *supra* note 4, at 12.
[63] 63 Fed. Reg. at 35,395.

scrubbers, dehydration equipment, and diffuser tanks.[64] These controls are installed and utilized based on the specific needs of specific pipeline system segments.

Most compressor stations are equipped with scrubbers and accumulation tanks that remove pipeline liquids from the gas stream prior to recompression. This is an essential part of routine operations to prevent damage to the compression equipment.[65] Pipeline companies also analyze the PCB concentration levels in the liquids removed from the classified zones to comply with the requirements of the PCB use authorization, as well as to manage the pipeline's liquid reuse and disposal options.

In addition, pipeline companies regularly replace filter elements and service gas compression equipment, which also removes PCB-containing products from the pipeline system. Because PCBs are highly persistent and difficult to remove completely from the crevices and internal passages of gas compressors and other complex equipment, and because many PCB sources within the pipeline system release PCBs through "diffusion" rather than in a singular flow, natural gas pipeline operators monitor their compressor lubricating oil and drain and replace oil that shows signs of potential impact from the legacy remnants of PCB-containing products.[66] Pipeline companies also drain selected valves at compressor stations and along the mainline, as well as other liquid collection points, to remove accumulated liquids. Any liquids containing PCBs are handled and disposed of as required.

Pipeline companies run devices known as "pigs" through pipeline segments to clean, inspect, and remove incidental pipeline liquids in the pipeline. The extent of pigging has increased significantly in recent years due to the requirements of the DOT's Pipeline Integrity

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[64] PkD, *supra* note 6, at 1, 29-33.
[65] PkD, *supra* note 6, at 29-30; SSPA, *supra* note 4, at 15-16.
[66] *See* SSPA, *supra* note 4, at s. 5; Exponent, *supra* note 12, at s. 2.

Management Program.[67] Under the program, as discussed below, pipelines are required to periodically assess the integrity of their lines. The most efficient and effective way to do this is to run "smart pigs," which are electronic internal inspection devices that record pipeline conditions, such as pipeline deformations and metal loss.[68] Consequently, INGAA members modified their pipeline systems to allow pigging. Prior to running a smart pig, pipeline companies must run a series of scrubber pigs through the system to clean and remove free liquids and debris to ensure the smart pig sensors make proper contact with the interior surface of the pipe. During cleaning operations, the scrubber pig scrapes the interior of the pipeline walls. In the process, incidental pipeline liquids are pushed in front of the pig and mixed with debris, which may contain PCBs. Pipeline liquids act as a solvent to remove PCBs from the pipeline's internal walls. Pigging is a very effective way to sweep liquids from the pipeline for ultimate disposal and, for affected pipelines, to gradually remove PCBs from the interior of the pipeline. Pigging is a very effective way to sweep liquids from the pipeline for ultimate disposal.

Pigging operations will not result in the full removal of the PCBs adhering to the pipeline walls. Also certain segments of the pipelines cannot be pigged due to design conditions (e.g., pipe diameter changes, valve configurations, river crossing designs, etc.). In those segments of pipelines containing PCBs at concentrations at or above 50 ppm, pipeline companies generally sample the liquids at pig receiver traps or historical liquid collection points to monitor the PCB levels within the system.

Despite the substantial measures taken by the natural gas pipeline industry to manage residual PCBs in certain natural gas pipelines, it is simply impossible to remove all PCBs from

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[67] *See generally* 49 C.F.R. Part 192.
[68] *See* PkD, *supra* note 6, at 38. Note, however, that not all pipeline segments are "piggable." *Id.*

the entire transmission system to the standards proposed by the EPA in the ANPRM.[69] PCBs in the transmission system blend with pipeline liquids and attach and diffuse into internal coatings, solid surfaces and other pipeline materials. While cleaning the system and replacing contaminated oils and grease has removed the majority of PCB mass, trace amounts will continue to leach from pipeline materials over a very long period of time, even where pipeline equipment is subjected to repeated draining and flushing.[70] Given the complexity of certain pipeline equipment, some surfaces simply are not accessible by pipeline liquids, pigs or cleaning solvents, further complicating any effort to eliminate PCBs from the system.[71]

Although residual PCBs remain in certain segments of the pipeline system, it must be emphasized that no new PCBs have been introduced into the system since the TSCA ban went into effect in the 1970s. Further, large quantities of PCBs have been removed from the system by disposing of PCB-containing lubricating oils from turbines and centrifugal compressors and pipeline liquids from compressor stations, mainline valves and other collection points, and by cleaning or replacing PCB-impacted equipment since the 1980s.[72] As will be discussed below, these remaining PCB residuals pose no risk to health or the environment. By continuing to take measures to reduce the already significantly diminished quantity of PCBs in impacted segments of the pipeline system, the risk of PCB exposure is substantially lower today than it was when the CMP went into effect in 1981 and when the Mega Rule went into effect in 1998. Thus, the Mega Rule is clearly effective.

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[69] *See* SSPA, *supra* note 4, at s. 7; Exponent, *supra* note 12, at s. 2.
[70] *See* SSPA, *supra* note 4, at ss. 5, 7; Exponent, *supra* note 12, at s.2.
[71] Exponent, *supra* note 12, at s. 2.
[72] SSPA, *supra* note 4, at s. 6.

E. In Addition to the Mega Rule, the Comprehensive Federal Regulatory Scheme Governing Natural Gas Pipelines Thoroughly Protects Health and the Environment

1. The Natural Gas Pipeline Industry Is Highly Regulated

The natural gas pipeline industry is one of the most highly-regulated industries in the country. To ensure that natural gas companies are able to deliver natural gas reliably and efficiently on an open, uninterrupted, and continuous basis to local utilities, homes, businesses, factories, schools, hospitals and other institutions, natural gas pipelines are subject to comprehensive federal oversight. Interstate pipelines are regulated by multiple federal agencies which, together, effectively ensure a safe and reliable pipeline system that protects the public and the environment from the risk of residual PCB exposure.

In addition to the EPA's Mega Rule, the Federal Energy Regulatory Commission (FERC or Commission), an independent federal agency, approves and authorizes the construction of interstate pipelines and regulates pipeline rates. The Pipeline and Hazardous Materials Safety Administration (PHMSA), within the DOT, the Occupational Safety and Health Administration (OSHA) within the Department of Labor (DOL),[73] and the Transportation Security Administration (TSA) within the Department of Homeland Security (DHS) also oversee distinct facets of natural gas pipeline system and pipeline management practices, including pipeline construction, systems integrity, pipeline security, and employee health and safety. The regulatory programs implemented by these agencies ensure that the interstate natural gas transmission system is operated safely and reliably, and that health and the environment are protected from any unreasonable risk of PCB exposure.

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[73] Pursuant to a 1972 memorandum of understanding, the DOT and the DOL agreed to coordinate their respective statutory duties to establish standards and regulate worker safety. 1972 Memorandum of Understanding Between OSHA and DOT, http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/1972_DOT_OSHA.pdf.

The FERC has authority pursuant to the Natural Gas Act to approve the construction of natural gas facilities and facility abandonment.[74] The Commission reviews and approves applications for the construction and operation of natural gas pipelines. In order for FERC to certificate a project, each pipeline applicant must certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facilities in accordance with DOT safety standards or certify that is has been granted a waiver of the requirements.[75] The FERC also serves as the lead agency overseeing compliance with the National Environmental Policy Act (NEPA), thus integrating federal, state and other environmental requirements into its certification process.[76]

Natural gas pipelines also must file tariffs with the FERC setting forth their rates and terms and conditions of service. Pipelines do not own the gas that they transport; the gas is owned by the shipper/customer. Accordingly, in order to ensure that gas has a consistent heating value and composition, and to limit the amount of pipeline liquids in the gas stream which, as described above, can harm pipeline compressor facilities and can unnecessarily consume space in the pipeline system, pipeline tariffs provide gas quality specifications for the gas they are willing to accept into the system.[77] Pipelines also enter into interconnect agreements with connecting pipelines (both upstream closer to the source of the gas and downstream closer to the marketplace). Even with these tariff specifications, which limit pipeline liquids in the system, liquids do occur. Thus, pipeline companies implement various controls and practices to recover incidental pipeline liquids along the pipeline, resulting in a substantial reduction of PCBs in natural gas pipeline systems wholly apart from the Mega Rule use authorization requirements.

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[74] 15 U.S.C. § 717 *et seq*.
[75] 15 U.S.C. § 717f; 18 C.F.R. § 157.14(a)(9)(vi).
[76] *See* FERC, Processes for the Environmental and Historic Preservation Review of Proposed Interstate Natural Gas Facilities (May 29, 2003), *available at* http://www.ferc.gov/industries/gas/enviro/gasprocess.pdf.
[77] *See* Natural Gas Council, Liquid Hydrocarbon Drop Out in Natural Gas Infrastructure 4, 5, 15 (Feb. 28, 2005), *available at* http://www.beg.utexas.edu/energyecon/lng/documents/NGC_HDP_Paper.pdf.

The DOT, through PHMSA, imposes rigorous design and construction standards on natural gas pipelines. In addition, PHMSA is responsible for ensuring pipeline safety during pipeline construction and once a system becomes operational. The DOT has regulated the safety aspects of natural gas pipeline construction, operation and maintenance since 1968.[78] PHMSA dictates the strength of pipeline steel and the maximum allowable operating pressure of the pipeline, and ensures that the pipeline is built and operated safely. The Pipeline Safety Improvement Act of 2002 (PSIA)[79] significantly improved the way that natural gas pipeline companies safeguard the integrity of pipeline systems. Under the law, each pipeline operator is required to prepare and implement an "integrity management program" and to identify high-density population areas near a pipeline and other areas where a pipeline failure presents the most significant risk of harm.[80] Pipeline companies are required to perform risk analyses and inspect these "high consequence" areas, and conduct baseline integrity assessments of each pipeline segment. Pipelines have used sophisticated pigging (internal inspection devices) to remove internal pipeline obstructions, clean debris from the pipeline, and to detect corrosion, dents, and pipeline weaknesses. The DOT regulations require pipelines to identify and repair any anomalies on a strict and short-term schedule in order to ensure a safe pipeline system. As mentioned above, pipelines predominantly have chosen sophisticated pigging (internal inspection devices) to remove internal pipeline obstructions, clean debris from the pipeline, and to detect corrosion, dents, and pipeline weaknesses. The process of utilizing pigging as a tool also presents the opportunity to remove pipeline liquids by pushing them to collection points. Under the PSIA, pipelines are required to re-inspect their pipeline systems every seven years. The

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[78] Natural Gas Pipeline Safety Act of 1968, Pub. L. No. 90-481, 82 Stat. 720.
[79] 49 U.S.C. § 60101 *et seq.*
[80] 49 U.S.C. § 60109.

regulations promulgated by the DOT require natural gas pipeline operators to assess pipeline integrity on an ongoing basis; to improve pipeline data management; to maintain the pipeline through necessary repairs and remediation; and to take action to prevent and mitigate potential harm.[81] The integrity management regulations comprehensively address pipeline facilities and operations, including materials, pipe and component design, construction, maintenance and repair, corrosion control, test requirements and personnel.[82] As described above, the DOT's pipeline integrity management program, which requires internal pipeline inspections and internal cleaning, reduces PCBs in the natural gas transmission system and ensures that the integrity of the system is maintained such that health and the environment are effectively protected.

In addition to pipeline integrity, agencies also regulate pipeline security and the safety of pipeline employees. Both PHMSA and TSA are responsible for regulating pipeline security. In August 2006, these agencies agreed to coordinate safety and security activities.[83] The agencies agreed, among other things, to consult prior to disseminating any security requirements, voluntary standards, and guidelines that affect pipeline security.[84] The TSA's Pipeline Security Division currently is revising security guidelines to be distributed later in 2010.[85]

Under both the Mega Rule and OSHA, the safety of employees who manage pipeline liquids is protected through mandatory training programs and the use of personal protective equipment.[86] The EPA's focus on ensuring pipeline worker use of personal protective

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[81] *See* 49 C.F.R. Part 192 (minimum safety standards); FERC, Guidance on Repairs to Interstate Natural Gas Pipelines (2005), at 12.
[82] 49 C.F.R. Subpart O.
[83] Annex to the Memorandum of Understanding Between the DHS and DOT (Aug. 9, 2006), *available at* http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Annex%20to%20MOU%20between%20TSA-PHMSA.PDF.
[84] *Id.*
[85] TSA: Standards & Regulations, http://www.tsa.gov/what_we_do/tsnm/pipelines/standards.shtm.
[86] *E.g.*, 40 C.F.R. §§ 761.60(b)(8), 761.79(e)(2) (requiring the use of "protective clothing or equipment to protect against dermal contact or inhalation of PCBs or materials containing PCBs").

equipment (PPE), a responsibility that typically falls to OSHA, only serves to highlight the fact that workers are the only class of people that bear any realistic risk of exposure. As discussed, the EPA already concluded that pipeline workers are not at risk.[87] Further, OSHA set enforceable permissible exposure limits (PELs), based on an eight-hour time-weighted average, in order to protect workers against the health effects of exposure to hazardous substances.[88]

Under certain circumstances, other federal agencies also exercise some limited oversight of natural gas pipeline operations to additionally ensure the safety of health and the environment. For example, the Fish and Wildlife Service, the Army Corps of Engineers, and the Bureau of Land Management all play a role in ensuring that natural gas pipelines do not pose an unreasonable risk of harm. Depending on the project, these agencies have jurisdiction over specific aspects of new pipeline construction and the removal and replacement of existing pipelines and equipment.[89]

Pipelines are subject to an additional network of federal and state laws that help to reduce the risk of inadvertent damage to underground pipelines during excavation and construction work. Interstate gas pipeline facilities in particular are required to provide annually to each municipality in which their facilities are located a map of such facilities.[90] In addition, federal law requires states to adopt "one-call" damage prevention programs with certain minimum requirements before they can receive grants through federal pipeline safety laws.[91] Most, if not all, states have complied and enacted laws requiring pipeline companies and other operators of

[87] 49 Fed. Reg. at 28,186.
[88] 29 C.F.R. § 1910 Subpart I; § 1910.1000 tbl.Z-1.
[89] For example, the Fish and Wildlife Service would become involved where a project may impact endangered or protected species. The Army Corps of Engineers must be consulted where pipelines cross navigable waters.
[90] 49 U.S.C. § 60102(c)(4).
[91] Accountable Pipeline Safety and Partnership Act of 1996, Pub. L. 104- 304, 110 Stat. 3793; 49 C.F.R. §§ 198.35, .37; *see also* Pipeline Safety Improvement Act of 2002, Pub. L. 107-355, 116 Stat. 2985.

underground facilities to register the location of their lines with a centralized one-call notification program. Typically, such state laws also require persons who wish to engage in excavation or demolition activities to take reasonable steps to discern the location of any underground facilities and to call a statewide hotline to provide advance notice of their planned excavation.[92] By dialing the universal one-call number 8-1-1, callers are forwarded to their local call center.[93] Once notified of proposed excavation activities, underground facility owners and operators must mark the locations of their facilities to help prevent accidental excavation damage.

The regulatory programs governing natural gas pipeline systems, taken together, are comprehensive in their protection of health and the environment. As a result, any risk posed by PCBs currently contained within the pipeline system is demonstrably *de minimis*.

2. Regulatory Oversight of Pipeline Operations by Multiple Governmental Agencies Also Ensures that All Potential Access Points in the Pipeline System Are Safely Managed to Prevent Exposure

Although the natural gas pipeline system does not meet the EPA's definition of "totally enclosed," the pipeline system, by design and necessity, is highly contained and controlled.[94] As previously discussed, the presence of legacy PCBs at concentrations of 50 ppm or more of incidental pipeline liquids typically is limited to isolated segments of the interstate transmission system. These segments are subject to continuous monitoring and removal activities pursuant to the current PCB use authorization. While pipeline systems are highly complex, there are only

[92] *See, e.g.*, Illinois Underground Utility Facility Damage Prevention Act, 220 Ill. Comp. Stat. 50/1 *et seq.*; Underground Facility Damage Prevention and Safety Act, Tex. Util. Code Ann. tit. 5, ch. 251; Kansas Underground Utility Damage Prevention Act, Kan. Stat. Ann. § 66-1801 *et seq*.

[93] Call 811 – Know What's Below, http://www.call811.com.

[94] 15 U.S.C. § 2605(e)(2)(c); 40 C.F.R. § 761.20; *see* Exponent, *supra* note 12, at vi ("Exposure to the PCBs is limited, because the PCBs are contained within the pipeline system where the public and the environment have little or no potential for exposure."); PkD, *supra* note 6, at 33 ("Pipelines operate under pressure and are therefore inherently closed systems, so the general public is not exposed to pipeline liquids under normal operating conditions.").

limited points that present a potential exposure risk, such as liquid collection points.[95] As noted previously, the system, including the potential exposure points, is highly regulated by a number of federal agencies with overlapping authority to ensure pipeline integrity and security of facilities.

Pursuant to the current PCB regulations, all above-ground sources of PCBs must be marked.[96] The general public is not allowed access to these points or to pipeline facilities in general since they are secured sites.[97] The EPA previously recognized that marking underground sources of PCBs is unworkable and unnecessary, because they are not accessible and present no risk of exposure.[98]

As the EPA recognized, the PCB exposure risk associated with natural gas pipelines is occupational—pipeline employees have a greater risk of exposure relative to the general public—but even pipeline employee exposure is extremely limited, as pipeline employees utilize PPE, as required under the law.[99] Given the infrequent occasions they handle PCB-containing materials, there is no unreasonable risk to their health.[100]

> Exposure potentially occurs when liquids are removed from the system by workers (e.g., at drips or separators). The frequency of *exposure to PCB-containing media* (e.g., liquids, concrete surface, or indoor air) *is very limited for natural gas transmission pipeline workers*, and exposures are generally controlled by the use of proper safety procedures, including the use of PPE. For these reasons, PCB exposure risks to pipeline workers wearing PPE in compliance with current operational procedures are *negligible*.[101]

[95] PkD, *supra* note 6, at 33; Exponent, *supra* note 12, at s. 3.
[96] 40 C.F.R. § 761.30(i)(1)(iii)(A)(6).
[97] *See* PkD, *supra* note 6, at 3, 22.
[98] 63 Fed. Reg. at 35,396.
[99] 49 Fed. Reg. at 28,186.
[100] 49 Fed. Reg. at 28,186; Exponent, *supra* note 12, at s. 5; EPA, 1984 Exposure Assessment, *supra* note 41.
[101] Exponent, *supra* note 12, at 21 (emphasis added).

As the EPA also has acknowledged, "[t]he toxic effects of PCBs do not play a role in most uses where there is little, if any, actual exposure."[102]

Pipeline liquids, the "vehicle" for PCB migration in impacted pipeline segments, are controlled and managed through a number of methods, including, but not limited to, capturing liquids in drips, scrubbers, filters and separators, and routine pigging of the lines. Pipeline employees, who clean and drain the system of these pipeline liquids, are specifically trained to handle and manage liquids and are protected by personal protective equipment as required by the Mega Rule and OSHA.[103] The PHMSA's comprehensive regulations further ensure that the integrity of pipeline system is monitored and maintained in order to reduce the risk of a failure. Data from the National Response Center (NRC) appears to confirm that natural gas pipelines present little to no risk of exposing the public to PCBs.[104]

In addition, PCBs do not pose any unreasonable risk to end-use customers in traditional distribution systems, which operate at a low pressure.[105] When distribution pipelines deliver gas to their end-use customers, the pipeline reduces its pressure at the customer's delivery point. As a result of these differences in temperature and pressure in low-velocity distribution lines, pipeline liquids in distribution lines that may carry PCBs are highly unlikely to migrate to end customers' meters. In the unlikely event pipeline liquids do reach the customers' meters, the

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[102] 63 Fed. Reg. at 35,384.

[103] *See, e.g.*, 40 C.F.R. §§ 761.60(b)(8), 761.79(e)(2) (requiring the use of "protective clothing or equipment to protect against dermal contact or inhalation of PCBs or materials containing PCBs").

[104] According a review of the publicly available NRC database, it appears that out of 27 reported pipeline-related releases implicating PCBs, the majority of which occurred prior to 2000, only eleven were identified or associated with natural gas pipelines. *See* National Response Center, Query Page, http://www.nrc.uscg.mil/foia.html (incident type, "pipeline"; material name, "PCB" or "polychlorinated biphenyl") (last visited Aug. 6, 2010).

[105] 49 Fed. Reg. at 28,186 ("EPA has also examined monitoring data for indoor air concentrations of PCBs in homes using natural gas. Based on these data, the Agency has found no evidence that PCBs in the compressors or in the liquid of natural gas pipelines are entering customers' homes. Since exposure and toxicity are the two basic elements of risk, if there is no additional exposure to PCBs attributable to the natural gas, there will be no additional risk to the consumers.).

liquids would be trapped at the meters. This conclusion is further confirmed by an April 1982 study performed by New York natural gas utilities under the direction of the New York Department of Health, Bureau of Toxic Substance Assessment. Under this system-wide study, gas utilities in New York tested source and distribution systems for the presence of PCBs. Each company that detected PCBs in their distribution systems then tested the kitchen air of several area homes, both with and without natural gas ranges. According to the study, there was no appreciable difference in PCB concentration between the ambient air of households with and without natural gas ranges.[106]

Prior to this ANPRM, the EPA agreed with industry that PCBs in interstate pipelines do not pose an unreasonable risk of harm to the general public. As discussed, the EPA unconditionally authorized PCB use in natural gas pipeline systems at concentrations under 50 ppm. "EPA has determined that the use of PCBs in the compressors and in the liquid found in natural gas pipelines *at concentrations of less than 50 ppm does not present an unreasonable risk* of injury to human health or the environment."[107] At concentrations above this level, the EPA authorized PCB use provided that natural gas pipeline companies continue to sample the affected lines, actively take measures to reduce or eliminate PCBs from their system and mark all aboveground sources of PCBs at or above a concentration of 50 ppm. Under these circumstances, the EPA determined that continued presence of legacy PCBs in certain natural gas pipeline systems at concentrations above 50 ppm did not present an unreasonable risk of injury to health or the environment.[108] The EPA has not produced any additional information to suggest that its previous determinations were flawed or should otherwise be revised. Based on

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[106] New York Indoor Air Study, *supra* note 42, at 9 ("This evaluation showed no significant differences in the characteristics of the natural gas and control houses.").
[107] 49 Fed. Reg. at 28,186 (emphasis added).
[108] 63 Fed. Reg. at 35,399.

the highly contained nature of the natural gas pipeline system and the continued effectiveness of existing engineering controls to manage and reduce PCB levels and migration, the EPA's original determination continues to be valid.

V. CHANGES TO THE MEGA RULE ADVANCED BY THE EPA WOULD VIOLATE ALL APPLICABLE LEGAL STANDARDS

A. The EPA Cannot Meet Its Burden to Amend the Existing Mega Rule

It is well-established that when a federal agency, such as the EPA, seeks to amend its existing rules or regulations, that agency *exclusively* bears the burden of proof to support any proposed change. It must "offer a reasoned explanation for the change."[109] Here, the EPA is suggesting sweeping changes to the Mega Rule without providing justification and a reasoned rationale to support these changes. Instead, the EPA made only generic statements in the ANPRM related to the risks that PCBs may pose to health or the environment, and made no statements regarding the potential economic impact of its proposals.

In particular, the EPA is proposing to amend the provisions of 40 CFR § 761.30(i) that relate to use and reuse of PCBs in natural gas pipeline systems. The current Mega Rule grants a use authorization for PCBs in natural gas pipelines, without any conditions at concentrations below 50 ppm, and with certain conditions at concentrations at or greater than 50 ppm.[110] In promulgating the Mega Rule in 1998, the EPA determined that this use authorization does not

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[109] *Citizens Awareness Network, Inc. v. U.S.*, 391 F.3d 338, 351 (1st Cir. 2004); *see also, e.g.*, *Stroe v. Immigration and Naturalization Service*, 256 F.3d 498, 503 (7th Cir. 2001) ("[T]he agency cannot . . . reverse course without any explanation; its about-faces must be reasoned."); *Voyageurs Region National Park Ass'n v. Lujan*, 966 F.2d 424, 428 (8th Cir. 1992) ("An agency may amend its regulations . . . if it provides explanations when its rule-making reflects significant policy changes."). "If the agency fails to furnish such an explanation, or if the proffered explanation fails to demonstrate that the agency fully considered its new course, the revised rules must be set aside." *Id.*; *see also Motor Vehicle Mfrs. Ass'n of the U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 42 (1983) ("If Congress established a presumption from which judicial review should start, that presumption . . . is . . . *against* changes in current policy that are not justified by the rulemaking record.") (emphasis original); *Jezierski v. Mukasey*, 543 F.3d 886, 889 (7th Cir. 2008) ("An administrative agency can change its rules, but it has to justify the change, and a challenge to the adequacy of the agency's justification for doing so presents a question of law.").

[110] *See* 40 C.F.R. § 761.30(i); 63 Fed. Reg. at 35,404.

pose a risk to health or the environment.[111] The science underlying the EPA's 1998 determination has not changed and the EPA has not provided any scientific support for its contemplated amendments to the Mega Rule.

The EPA made unsubstantiated statements in the ANPRM and failed to produce any scientific or technical source materials to justify the assertion that the existing use authorization for PCBs in natural gas pipeline systems creates an unreasonable risk of human PCB exposure or environmental damage. Specifically, the EPA only relied on toxicity studies from 1996 and 2000, which the EPA admitted are inconclusive. In these studies, the EPA did not cite to any purported health effects as a result of PCBs in natural gas pipeline systems.[112] The EPA failed to weigh the effects that PCBs in natural gas pipeline systems have on health or the environment or the magnitude of any such exposure. Moreover, the EPA did not consider the reasonably ascertainable economic consequences of eliminating the use authorization for PCBs in natural gas pipelines.[113]

On a more fundamental level, the EPA's reliance on inconclusive toxicity studies, without consideration of exposure studies, is insupportable from a risk assessment perspective.[114] As previously stated, the EPA issued an Exposure Assessment Report in 1984, in which the EPA addressed the toxicity of PCB cogeners and concluded that PCBs in natural gas pipeline systems do not create an unreasonable exposure risk to health or the environment.[115] Of note, given the regulatory requirements imposed by the FERC, PHMSA and TSA, the potential exposure points in natural gas pipeline systems are even better protected and better controlled today than they

[111] *See, e.g.*, 63 Fed. Reg. at 35,392, 35,410.
[112] *See* 75 Fed. Reg. at 17,649.
[113] 75 Fed. Reg. at 17,657.
[114] *See generally* Exponent, *supra* note 12.
[115] *See* Exponent, *supra* note 12; EPA, 1984 Exposure Assessment, *supra* note 41.

were in 1984. Furthermore, a recent study confirmed the correctness and integrity of the EPA's previous findings and conclusions.[116] Thus, the EPA's previous determination that PCBs in natural gas pipeline systems do not pose an unreasonable exposure risk still holds true today.

INGAA is not aware of any new risk assessment or other risk analysis, performed with respect to natural gas pipeline systems, that would support the conclusion that the existing standard is not protective of health or the environment. Likewise, the EPA also failed to provide any scientific or technical support for eliminating the use authorization for air compressor systems or changing the use authorization for porous surfaces. This failure is particularly unsettling for INGAA members as substantial reductions of PCBs in the natural gas pipeline system have occurred as a result of the industry's compliance with the Mega Rule, which in turn has reduced the risk of human and environmental exposure to PCBs.

With respect to the regulation of PCBs in other countries, the EPA should note that there is no PCB ban or mandated phase-out for the use of PCBs in Canadian natural gas pipelines. Canada allows the unrestricted use of PCBs in natural gas pipelines, without a regulatory limit, without a mandated phase-out, and with no substantive conditions.[117] Canadian natural gas pipeline companies can operate their systems with PCBs present at any concentration level or any mass level. By allowing the presence of PCBs in natural gas pipelines, Canada clearly understands the fundamental reality that PCBs cannot be purged from the system.

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[116] Exponent, *supra* note 12.

[117] PCB Regulations, S.O.R. 2008-273, s.14(1)(b) (Can.). The only conditions are labeling requirements, which are much less onerous than the conditions the United States pipelines are subject to under the current Mega Rule.

B. Changes to the Mega Rule Advanced by the EPA Are Inconsistent with TSCA

Under the law, any proposed changes to the Mega Rule must be consistent with its authorizing statute, in this case, TSCA.[118] Section 6(e)(2)(A) of TSCA prohibits the use of PCBs in commerce "other than in a totally enclosed manner."[119] However, Section 6(e)(2)(B) of TSCA authorizes the EPA to promulgate regulations authorizing the use of PCBs other than in a totally enclosed manner where the EPA determines that such use does not "present an unreasonable risk of injury to health or the environment."[120] The Mega Rule is consistent with TSCA because the existing PCB use authorization for natural gas pipelines is based on a prior determination that the presence of PCBs in natural gas pipelines does not present an unreasonable risk of injury to health or the environment. The changes proposed in the ANPRM, however, are inconsistent with TSCA because they would eliminate the use authorization for PCBs in natural gas pipelines, even where PCBs are used in a manner that the EPA determined poses no unreasonable risk to health or the environment. Therefore, the EPA's proposed changes to the Mega Rule effectively ignore Section 6(e)(2)(B) of TSCA.

C. Changes to the Mega Rule Advanced by the EPA Are Arbitrary and Capricious

The changes to the Mega Rule that the EPA is considering also would run afoul of the maxim that amendments to administrative regulations cannot be arbitrary or capricious.[121] "An agency rule is arbitrary and capricious 'if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered

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[118] *See, e.g., U.S. v. Larionoff*, 431 U.S. 864, 873 (1977) ("[R]egulations, in order to be valid must be consistent with the statute under which they were promulgated. . . . 'A regulation . . . [that] operates to create a rule out of harmony with the statute, is a mere nullity.'").
[119] 15 U.S.C. § 2605(e)(2)(A).
[120] 15 U.S.C. § 2605(e)(2)(B).
[121] *See, e.g.,* 5 U.S.C. § 706(2)(A); *Sierra Club v. Clark*, 755 F.2d 608, 619 (8th Cir. 1985).

an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.'"[122] Promulgation of a regulation by an agency will be found to be arbitrary or capricious unless the agency can "demonstrate that it considered the relevant factors and alternatives after a full ventilation of the issues and that the choice it made based on that consideration was a reasonable one."[123]

The contemplated changes to the Mega Rule, with respect to natural gas pipeline systems, are arbitrary and capricious because the EPA failed to consider both technical feasibility and economic reasonableness. Because technical feasibility and economic reasonableness of regulatory implementation are "important aspects of the problem" and "relevant factors" that require "full ventilation" before agency action is taken, a federal regulation promulgated without demonstrated consideration of such critical factors is subject to nullification under the arbitrary and capricious standard.[124]

As noted above, eliminating the PCB use authorization for natural gas pipelines or lowering the standard to 1 ppm is not technically feasible. Supported by the opinions of nationally recognized experts, INGAA has provided persuasive evidence that it is technically impossible to purge all PCBs from the national natural gas pipeline system by 2020 or the foreseeable future. Compliance with the proposed changes to the Mega Rule likely would necessitate replacement of the existing natural gas pipeline system. This extensive system cannot be replaced by 2020 in light of regulatory requirements from other agencies, permitting requirements, equipment and man power constraints, construction standards, and economic and

[122] *Miami-Dade County v. U.S. Envtl. Prot. Agency*, 529 F.3d 1049, 1064 (11th Cir. 2008) (*quoting Motor Vehicle Mfrs. Ass'n of U.S.*, 463 U.S. at 43).
[123] *American Mining Co. v. Marshall*, 671 F.2d 1251, 1255 (10th Cir. 1982).
[124] *Miami-Date County*, 529 F.3d at 1064; *American Mining*, 671 F.2d at 1255.

practical realities. There is no evidence in the ANPRM that the EPA considered these insurmountable technical impediments to implementation before contemplating the changes to the Mega Rule, which would render such regulatory amendments, when promulgated, arbitrary and capricious.

Further, there is no evidence that the EPA considered to the economic consequences of eliminating the existing PCB use authorization for natural gas pipelines or lowering the standard, eliminating or significantly limiting the use authorization for air compressor systems, or modifying the use authorization for porous surfaces. The EPA failed to perform either a microeconomic (cost to individual companies) or a macroeconomic (cost to society) analysis of the proposed rule changes. Replacement of PCB-impacted sections of pipeline would cause a decrease in interstate pipeline capacity and possibly pipeline outages resulting in higher delivered cost of natural gas to consumers and greater price volatility. The substantial compliance costs resulting from the proposed changes to the Mega Rule would be passed on to ratepayers through higher pipeline transportation rates. The proposals being considered by the EPA would have severe and long-lasting impacts on the ability to provide homes and businesses with natural gas at reasonable prices. In addition, the EPA does not appear to have considered whether the industrial or workforce capacity exists to both manufacture new pipes and components as well as to remove and replace existing PCB-impacted segments of the natural gas transmission system within the extremely accelerated timeframe advanced in the ANPRM. Moreover, such accelerated replacement also would burden the resources of numerous federal, state, and local regulatory agencies which would be required to provide regulatory authorizations for the substantial system-wide modifications the rule change would trigger.

For all of these reasons, the EPA's contemplated changes to the Mega Rule are arbitrary, capricious and contrary to the mandates of TSCA and, therefore, are not justifiable or supportable as a matter of law.

VI. INGAA'S RESPONSE TO THE EPA'S SWEEPING PROPOSALS TO ELIMINATE THE USE AUTHORIZATION IN NATURAL GAS PIPELINES, TO LOWER THE REGULATORY STANDARD TO 1 PPM, TO INCREASE THE SAMPLING REQUIREMENTS AND TO INCREASE THE REPORTING REQUIREMENTS

The EPA's contemplated changes to the provisions of the Mega Rule that apply to the interstate natural gas transmission industry are technically infeasible, economically unreasonable, and unjustifiable from a risk assessment perspective. Contrary to the EPA's assertion in the ANPRM, PCBs simply cannot be purged from certain segments of the pipeline system by 2020 or thereafter.[125] There is no foundation or support for the EPA's assertion. To attempt to comply, therefore, certain transmission companies would be forced to replace significant portions of the pipeline system, which could not be accomplished by the proposed 2020 compliance date. The economic impact of eliminating the use authorization, and the possibility of having to invest hundreds of millions (if not billions) of dollars in new infrastructure, would be financially crippling to individual companies. On a macroeconomic scale, the impact of abandoning pipeline infrastructure and disrupting the delivery supply of natural gas for an undetermined period of time while new infrastructure is being replaced would resonate through all sectors of our economy and all regions of the country, affecting our energy supply and threatening our energy security. The changes to the Mega Rule advanced by the EPA simply are not realistic.

[125] *See* SSPA, *supra* note 4, at ss. 6, 7.

A. The Use Authorization for Natural Gas Pipelines Must Remain in Effect

1. Elimination of the Use Authorization for PCBs in Natural Gas Pipeline Systems Would Not Be Technically Feasible.

The use authorization for PCBs in the natural gas pipeline system must remain in effect based on the 50 ppm threshold. Contrary to the EPA's assertion in the ANPRM, all PCB molecules cannot be purged from the transmission system in the foreseeable future, nor can PCB concentration levels be reduced to less than 50 ppm at all locations in the system by 2020 or in the foreseeable future.[126] Simply put, the EPA's proposal is impossible to achieve.

The vast majority of PCB mass that was present in the transmission system as of the early 1980s has been removed. Transmission companies also continue to remove PCBs in the impacted sections of the system on an ongoing basis, but still there are PCB molecules in certain pipeline segments and components, such as compressor stations. PCB concentration levels have also trended downward since the 1980s, but PCB concentrations still are above 50 ppm in certain affected segments and components.

Despite all of the extraordinary measures that the transmission industry has taken over the last 30 years, and despite all of the success that the industry has had in removing PCBs from the system, the EPA must acknowledge the basic, fundamental realities and limitations that are at issue. Namely, it is impossible to "purge" all PCBs from impacted portions of the natural gas system due to the complexity of the design and operation of the natural gas transmission system, the chemistry of PCBs at the molecular level, and the transport of PCBs that are present within the transmission system.

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[126] *See* SSPA, *supra* note 4, at ss. 6, 7.

As stated herein, the natural gas transmission system is a complex matrix of pipes, valves, compression facilities and numerous other pieces of equipment. While the transmission industry can flush certain segments of the system with solvents and run "pigs" through certain segments of pipe, there are numerous segments and components that can neither be flushed nor pigged. Nor does flushing or pigging remove all PCBs adhering to the internal surfaces of the pipelines. Furthermore, it is not possible for transmission companies to identify all sources of PCBs in their systems. The EPA acknowledged this fact when it promulgated the Mega Rule, and further acknowledged that the presence of PCBs in natural gas pipeline systems "is not well understood."[127] Complete removal of residual PCBs from the inside of thousands of miles of buried pipelines and all of the pieces of equipment in the system has its inherent limitations. Compressor stations, in particular, have so many small-diameter pipes, valves, fittings and other equipment that eliminating residual PCBs from every nook and cranny is just not possible.

PCBs also have unusual molecular properties, particularly their solubility and volatility. The EPA recognized that PCBs are soluble in oils but not in water, and further recognized, based on their volatility, that PCBs travel in the liquid phase but not in the gas phase.[128] PCBs also adhere to the weathered interior walls of pipe and other components in the system. PCBs, however, will dissolve off of the interior walls of the pipe and commingle with pipeline liquids, but will not travel within the natural gas stream. Therefore, the most effective method to capture and remove the PCBs that still remain in the transmission system is to remove the pipeline liquids.

[127] 63 Fed. Reg. at 35,395.
[128] *Id.*

It is important to understand that natural gas pipeline operations are designed to capture and remove oils and other pipeline liquids throughout the system, primarily at compressor stations. The fact is, transmission companies are in the business of delivering natural gas to their customers; they are not in the business of delivering oils and other pipeline liquids. Furthermore, compressor stations are designed to compress the natural gas in the gas phase; compressor stations, by definition, cannot compress liquids. In other words, gases can be compressed; liquids cannot. Therefore, liquids *must* be captured and removed from the system as part of normal pipeline operations.

Because transmission companies must remove liquids, transmission companies also must manage and remove any residual PCBs that are contained in the liquids, which they have done successfully on a regular and ongoing basis. Sampling data supports that principle. Due to the scientific principles of diffusion, however, the process to remove the remaining PCB molecules takes time. This process cannot be rushed.

Although residual PCBs still remain in the transmission system, these remaining PCB molecules present no unreasonable risk to health or the environment. The EPA, acknowledging that natural gas pipeline systems are contained and regulated, recognized this fact in prior rulemakings and prior risk assessment studies. A recent risk assessment study confirms that PCBs in natural gas pipeline systems do not present an unreasonable risk.[129]

The current Mega Rule works successfully to reduce PCBs because it is based on real principles of science and understood natural gas pipeline operations. Indeed, the centerpiece of the Mega Rule is based on liquids management, and has other elements to ensure PCB management and removal from the system. The transmission industry is working towards the

[129] Exponent, *supra* note 12.

ultimate goal of removing the residual PCBs from the system, but in light of fundamental realities and limitations, the process takes time.

If the EPA eliminates the use authorization or lowers the standard, as it is proposing, certain pipelines will be out of compliance and will be forced to shut down. Thus, the only way for these pipeline companies to attempt to comply would be to replace significant segments of the system. Realistically, however, that is not possible. Therefore, the use authorization in the Mega Rule must remain in effect at the current 50 ppm threshold.

2. Elimination of the Use Authorization for Natural Gas Pipeline Systems Would Not Be Economically Reasonable.

The EPA's proposal to eliminate the use authorization for PCBs in the natural gas pipeline system fails to account for the economic impact of such a rule change. The EPA specifically failed to consider the microeconomic impact on each affected transmission company, and also failed to consider the macroeconomic impact on ratepayers, natural gas consumers, and all sectors of our society that rely on the natural gas industry to meet its deliverability obligations every single day, without interruption. With all due respect, the EPA must understand that the cost burden of its proposal on the interstate transmission industry and on our entire society is so enormous that such a proposal can only be described as irresponsible and unrealistic.

The EPA previously acknowledged that a use authorization for PCBs in natural gas pipelines is necessary, balancing the minimal risk to the public with recognized economic considerations and societal burdens.

> [The Mega Rule] authorizes the use and reuse of natural gas pipeline systems that were contaminated with PCBs in the past, provided certain actions are taken. Unless use of the system was authorized, the system would have to cease operation until the PCBs were removed, burdening the public by making fuel more costly or unavailable. EPA believes this burden would outweigh

> the risk posed by allowing continued use of the system, so long as the PCBs are contained in the system, are regularly removed in the condensate, and, when removed, are stored and disposed of in accordance with these regulations.[130]

Nothing has changed since the EPA promulgated the Mega Rule in 1998 to invalidate the agency's conclusion.

From a microeconomic perspective, the economic burden on each affected pipeline company is beyond unreasonable. To comply with the EPA's proposal, certain transmission companies would be forced to shut down segments and components of their pipelines, including compressor stations, and would be forced to replace these facilities. Furthermore, due to the persistent nature of PCBs and the manner that they move within pipeline liquids contained in the pipeline system, it could be necessary to shut down and replace significant segments of the system at one time, including gas compressor stations and other facilities. That is, if the transmission industry attempts to replace the system segment by segment, the industry would face the very real risk that PCBs from impacted segments of the system would migrate gradually into the newly-replaced segments of the system, thereby re-contaminating the new pipelines and facilities. The cost to the affected transmission companies to replace the impacted segments of pipeline and facilities could be in the many hundreds of billions of dollars, which is an impossible economic burden by any reasonable measure.[131]

From a macroeconomic perspective, the cost to society would be so significant and far-reaching, in the short time that the EPA gave to the industry to comment on the ANPRM, it is incalculable. Many transmission companies currently use highly depreciated pipeline assets, which allow the companies to maintain a relatively low rate base. If these companies replace

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[130] 63 Fed. Reg. at 35,396.
[131] *See* Analysis Group, *supra* note 11, at 18-24.

large segments of their pipelines, however, their rate base will increase substantially, causing consumer prices to skyrocket. At the most basic level, the LDCs that take delivery of natural gas from the interstate transmission system would pass much of their costs on to their ratepayers, who are the end users, such as homeowners and small businesses. Other natural gas users that would be affected include electricity-generation power plants, large industrial and agricultural facilities, municipalities, hospitals, and schools. The economic impact on these institutions would be devastating.[132]

Rate increases made necessary by new regulatory standards also would disproportionately impact low-income families. That substantial rate increases are borne more heavily by the economically disadvantaged is supported by publicly available data. In the ANPRM, the EPA has questioned whether its proposal implicates any issues of environmental justice; clearly the impact to low-income communities of increased rates demonstrates that it does.

Moreover, the unreasonably high cost burden will have cascading economic effects impacting not only LDCs and each of their customers, but electric generation companies and each of their customers, large industrial and agricultural facilities and each of their customers, as well as manufacturers of products that use gas as an ingredient, such as methanol, plastics, and drywall.[133] These effects will further impact downstream segments of the economy. Because all sectors of our society are reliant on natural gas, the "daisy chain" of those impacted by the EPA's proposal to eliminate the use authorization extends far and wide. For example, the increased cost to produce fertilizers will have repercussions on domestic and international food production,

[132] *See* Analysis Group, *supra* note 11, at 24-28.
[133] Also included are pharmaceutical products. *See* Analysis Group, *supra* note 11, at 10.

which in turn will impact consumers across the country. An increase to the cost of drywall would affect the construction industry, impacting, among other things, the price and availability of low-income housing. The examples are endless.

Higher costs associated with the massive replacement of the transmission system is just the beginning. The EPA also must consider the consequences to society as a result of decreased capacity of the transmission system. Certain pipeline companies would not be able to meet their deliverability obligations to their customers, as required by the FERC. As a result, many markets could suffer partial extended outages of natural gas services, and the markets that receive their natural gas from a single source could suffer complete outages.[134]

Furthermore, the gas industry operates at or near full capacity throughout the year, whether moving gas to meet seasonal heating and cooling demands or sending gas into storage facilities. The shutdowns for pipeline removal and replacement necessary to bring the existing natural gas pipeline system into compliance with the proposed changes to the Mega Rule that would result in decreased interstate pipeline capacity also would threaten electric reliability, impact our national energy supply and threaten our national security.

In addition to replacement costs and the disruption to energy supplies, each devastating in its own right, the resulting cost impacts to natural gas could price the clean-burning fuel out of the electric generation market, increasing dispatch of fuels that have greater emissions. In turn, the EPA's proposal would undermine the agency's efforts to reduce emissions of pollutants such as nitrogen oxides, sulfur dioxide, particulate matter and GHG. Further, by altering gas pricing forecasts over the long term, planned construction of new gas mid-merit facilities and peaking

[134] *See* Analysis Group, *supra* note 11, at 4, 28-32 (noting generally the scope of potential difficulties and disruptions implicated by large-scale replacement of significant segments of natural gas transmission lines).

units also would be affected, decreasing overall grid reliability. In fact, the EPA's proposal would undermine the agency's efforts to reduce emissions of pollutants such as nitrogen oxides, sulfur dioxide, particulate matter and GHG because of the increased cost of natural gas.

The massive physical and regulatory undertaking required to remove natural gas pipelines alone would far outweigh any purported benefit to human health. Replacing segments of the pipeline system would require the involvement of numerous federal, state and local agencies and place a heavy burden on administrative resources. On the federal level alone, the FERC, PHMSA, TSA, various divisions of the EPA, the Army Corps of Engineers, the Bureau of Land Management, the U.S. Fish and Wildlife Service, among other agencies, all have oversight of various aspects of pipeline replacement. State and local agencies also would be involved in permitting, construction, acquisition of rights-of-way, among other things. Tribal nations also would be involved. Numerous public and private landowners where pipelines have easements also would be affected. Further, it is very likely that pipelines would need to acquire additional temporary or permanent rights-of-way, causing additional environmental impacts.[135]

The widespread pipeline and component replacement that would be made necessary by the EPA's proposal would impose impossible demands on suppliers, vendors and pipeline construction services. It is highly unlikely that the pipe steel fabrication industry would be able to manufacture enough new pipe material to meet this demand on an accelerated basis. Instead, this type of work would go overseas. Even if enough pipe material and other components could be manufactured to meet the increased demand, it is even more unlikely that there would be a sufficient and sizable construction work force to keep pace with the workload. There are a limited number of companies that are qualified to perform these services and the anticipated

[135] *See, e.g.*, Analysis Group, *supra* note 11, at 28-29.

scale would far exceed the capability to permit replacements in a timely manner and likely would grossly inflate costs. It is simply unrealistic to replace large segments of the pipeline system, which still have a long useful life.

The foregoing discussion also presumes that natural gas pipelines companies would be able to raise the capital necessary to finance pipeline removal and replacement in the first place. Typically, financing of pipeline expansion is in large part supported through collateralization of service agreements. If extensive replacement is precipitated by regulatory requirements, without new service agreements available as collateral, to the extent capital is even available, the cost to raise that capital will rise considerably.[136]

INGAA asserts that the far-reaching economic impacts of this proposed rule on both the interstate natural gas industry and society at large should dissuade the EPA from implementing the proposals set forth in the ANPRM. Looking at the issue not only from a risk assessment perspective, but also a cost-benefit perspective, there is no reason for the EPA to amend the use authorizations for PCBs in natural gas pipelines, air compressors, and porous surfaces under the Mega Rule.

B. The Standard for the Use Authorization Cannot Be Lowered to Less than 50 ppm, Let Alone 1 ppm

For many of the same reasons that it is infeasible to eliminate the use authorization for PCBs in natural gas pipelines, it is also infeasible to lower the standard to less than 50 ppm, let alone less than 1 ppm, as the EPA is suggesting in the ANPRM. The EPA's proposal is also unjustifiable in light of risk assessments of PCBs in natural gas pipelines, which focused on, among other things, the highly-contained design and configuration of the pipeline system.[137] It

[136] *See, e.g.*, Analysis Group, *supra* note 11, at 28.
[137] *See* Exponent, *supra* note 12.

is an undisputed fact that the interstate transmission system has only a limited number of potential exposure points, all of which are highly secured, monitored and inaccessible to the general public. Reducing the use authorization to any level less than 50 ppm is also impractical, unnecessary, uneconomical, and wasteful.[138]

As the EPA's own risk assessments and rulemakings have acknowledged, PCBs in natural gas pipelines do not present an unreasonable risk to health or the environment.[139] As discussed, the EPA admitted in the public record that the 50 ppm threshold is based on scientific considerations and factors.[140] Not only are pipeline employees adequately protected, but studies performed to date, including studies specifically performed at the request of the EPA, demonstrate conclusively that there is no unreasonable risk to natural gas residential customers.[141] These studies were based on well-settled principles of toxicology and risk assessment. A recently-performed study confirms the correctness and validity of the EPA's prior toxicological and risk assessment studies.[142] Further, consistent with these risk assessments (and the EPA's current approach to PCBs in natural gas pipelines), Canada allows the continued use of PCBs in natural gas pipelines at any concentration, even above 50 ppm.[143]

Moreover, contrary to the EPA's assertion, given the persistent nature of PCBs and the complexity of the pipeline system, it is not possible to purge PCBs from all segments of the system.[144] Equally true, although pipeline companies take numerous measures to remove PCBs from the system, it is not possible to clean all components of the system to levels less than 50

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[138] *See* discussion at Part VI, *infra*.
[139] 49 Fed. Reg. at 28,186; Exponent, *supra* note 12.
[140] 49 Fed. Reg. at 28,186; *see* discussion at Part IV.C.1, *supra*.
[141] 49 Fed. Reg. at 28,186; *see* discussion at Part IV.E.2, *supra*; New York Indoor Air Study, *supra* note 42.
[142] Exponent, *supra* note 12.
[143] PCB Regulations, S.O.R. 2008-273, s.14(1)(b) (Can.). While the Canadian regulations do phase out the use of PCBs in certain applications, there is no mandated phase-out for the Canadian natural gas pipeline system.
[144] *See* discussion at Part IV.D, *supra*; SSPA, *supra* note 4, at ss. 5, 7; Exponent, *supra* note 12, at s.2.

ppm, let alone 1 ppm. From a scientific basis, principles of diffusion limit the rate that PCBs can be removed from the pipeline system, even utilizing all presently available liquid management practices, engineering controls and flushing procedures. From a systems perspective, it is impractical to pig certain sections of piping due to size and configuration, and the piping in certain areas of compressor stations cannot be flushed given their size, design and location.

The principles of diffusion and the complexity of the pipeline system, taken together, also substantially reduce the effectiveness of more aggressive solvents, such as terpenes, to eliminate PCBs from the system. As a further complication, large volumes of the more aggressive solvents should not be introduced into the transmission system for a variety of reasons. For example, solvents could affect daily operational concerns, such as negative impacts to system components and pipeline integrity. Introducing large volumes of solvents with a higher propensity for volatilization would have other unintended consequences, namely, increased volumes of solvent waste, health and safety considerations for the handling and transportation of such waste, and potential increases in facility air emissions and corresponding violations of permit obligations.

INGAA is particularly concerned that if the EPA lowers the standard, pipeline operators will prematurely adopt remediation technologies that have yet to be proven in practice and, in fact, may have negative and far-reaching consequences. The industry has an obligation, before introducing new management practices that rely on chemicals and materials that have not been tested on a sufficient scale for widespread use in the transmission system, to ensure the safety of pipeline workers and pipeline system integrity and operations. The EPA should examine all of the potential impacts and the overall effectiveness of these solvents in pipeline systems, because operators would have to consider this method of solvent usage as a compliance option should the standard be lowered to less than 50 ppm.

Furthermore, many of the same economic factors that render the elimination of the use authorization unreasonable also apply to lowering the standard below 50 ppm. For the last 30 years, natural gas pipeline companies have been continuously removing PCBs from the transmission system through liquid management, and other engineering and operational controls. While PCBs remain in certain components of the system, those PCBs do not present an unreasonable risk of harm. And even in those areas of the system, PCB mass is reduced on an ongoing basis due to industry management practices. No new PCBs have been introduced into the system since they were banned, and a significant amount of PCBs are removed from the system on a regular basis as part of normal pipeline operations that have been in effect for many years. By lowering the standard system-wide, the EPA will require the transmission industry to spend an exorbitant sum of money, which ultimately will be passed on to ratepayers, to install additional controls and take additional measures that are not justifiable.

For all of these reasons, the EPA cannot responsibly lower the threshold to any level less than 50 ppm, let alone 1 ppm.

C. The Advanced Changes to the Sampling Requirements Are Impractical and Unnecessary

The EPA is contemplating substantial changes to the sampling protocol by requiring all transmission companies to take individual samples rather than composites or accumulations, and lowering the baseline for sampling from 50 ppm to 1 ppm.[145] The EPA did not articulate any reason in support of its proposal to require individual samples, nor did it articulate any reason in support of its proposal to lower the standard from 50 ppm to 1 ppm.

[145] 75 Fed. Reg. at 17,657.

Under the use authorization in the current Mega Rule, transmission companies are required to sample liquids at existing pipeline liquid collection points in the classified zones based on a standard of 50 ppm.[146] Thus, if the existing pipeline liquid collection points are designed for individual samples, such as drips or pig receivers, then the transmission companies are required to collect individual samples at those locations in the system. Likewise, if the existing pipeline liquid collection points are designed for composite samples, such as holding tanks, then the transmission companies are required to collect composite samples at those locations in the system.

The EPA's contemplated changes to the sampling protocol are neither practical nor necessary. First, under current sampling methodologies, the EPA's proposal to lower the sampling standard from 50 ppm to 1 ppm, is impractical. Because oil and pipeline liquids samples are not pure samples and contain matrix interferences, it will be difficult to consistently achieve a reporting limit of less than 1 ppm. More fundamentally, for all of the reasons stated in Part VI.B of these comments, it is infeasible, impractical and uneconomical to operate the natural gas transmission system based on any standard less than 50 ppm, let alone 1 ppm.

Second, given the design and complexity of the transmission system, it is not practical to require individual samples as proposed by the ANPRM. Under the current Mega Rule, however, samples must be taken from existing liquid collection points in the system. This current approach is correct in that it recognizes the operational reality that some liquid collection points are located at an area of the system where only individual samples can be collected, whereas other liquid collection points are located in an area of the system where only composite samples can be collected.

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[146] 40 C.F.R. § 761.30(i)(1)(iii)(E)(4).

As previously stated, the transmission system is a complex matrix of pipes, facilities and equipment. At certain points in the transmission system, there are two or more lines that run parallel to one another, the purpose of which is to increase capacity and meet market demand. The multiple lines may also cross-over, similar to how parallel railroad tracks cross-over, allowing pipeline liquids to move from one line to another. Cross-over also occurs as multiple lines enter compressor stations, and therefore pipeline liquids from multiple lines are collected in a single accumulation tank. Therefore, in these portions of the system, it is not practical for transmission companies to collect individual samples.

The sampling protocol under the existing Mega Rule makes sense, and transmission companies should continue to sample at the liquid collection points in the classified zones, as is required. By not differentiating between individual and composite samples in the current Mega Rule, the EPA clearly recognized the complexity of the pipeline system. Since the Mega Rule was promulgated, the complexity of the interstate natural gas transmission system has only increased. Thus, there exists no justifiable reason to change the current sampling protocol.

D. Advanced Changes to the Reporting Requirements Are Not Necessary

The EPA is considering changing the reporting requirements under the Mega Rule to require pipeline companies to report any sample results to the EPA that are greater than or equal to 50 ppm.[147] This represents a sharp departure from the reporting obligations under the current Mega Rule. Significantly, the EPA did not articulate any reason in support of its proposal. The reporting requirements under the current rule are efficient and effective; therefore, any change is not necessary.

[147] 75 Fed. Reg. at 17,657.

The transmission companies that participated in the CMP were required to submit bi-annual reports to the EPA, including sampling results. When the EPA revised the CMP in 1996, the remaining transmission companies in the program were required to submit annual reports.[148] When the Mega Rule went into effect, the EPA eliminated the reporting obligations, instituting, instead, a new common-sense approach to recordkeeping and reporting, as follows: "[A] natural gas pipeline system must document in writing all data collected and actions taken, or not taken, pursuant to [the use authorization] of this section. They must maintain the information for 3 years after the PCB concentration in the component or segment is reduced to <50 ppm, and make it available to the EPA upon request."[149] Under the current rule, transmission companies know exactly which records they must retain and for how long, and the EPA has the unequivocal right to obtain those records, upon request. The current recordkeeping and reporting requirement works, is effective, and does not impose any undue burden on the EPA or the transmission companies. There is no reason to amend a rule that is working.

VII. INGAA'S RESPONSE TO THE EPA'S SWEEPING PROPOSALS TO ELIMINATE AND/OR DRASTICALLY CHANGE THE USE AUTHORIZATIONS FOR "NON-PIPELINE" ISSUES THAT DIRECTLY IMPACT "PIPELINE" OPERATIONS

The EPA is also contemplating to eliminate or severely limit of the use authorization for air compressor systems and to drastically alter the use authorization for porous surfaces.[150] While air compressor systems are widely used in other industries, they are a critical component of the natural gas transmission system. It is essential therefore that the use authorization be continued without revision. Moreover, these air compressor systems typically are mounted on

[148] *See* Calhoun Memos, *supra* note 5.
[149] 40 C.F.R. § 761.30(i)(1)(iii)(C).
[150] 75 Fed. Reg. at 17,657.

porous surfaces (i.e., concrete pads). As such, any revision to the use authorization for porous surfaces could have an equally significant impact on natural gas pipeline operations.

The EPA has not provided justification for its proposal. In accordance with the legal standard discussed above, any such action would be plainly inconsistent with TSCA and would be arbitrary and capricious. Moreover, elimination or alteration of these use authorizations would be both technically infeasible and economically unreasonable.[151]

A. The Use Authorization for Air Compressor Systems Must Remain in Effect

The EPA asserts in the ANPRM that it has little information regarding the need to continue the current use authorization for air compressor systems under the Mega Rule and that it is therefore considering whether to "terminate or significantly limit" the use authorization. As its only justification, the agency stated that "the 10 years that these authorizations have been in place should have allowed the owners sufficient time to purge the PCBs from their systems."[152] The EPA's statements and conclusions regarding PCB-impacted air compressor systems are both factually and legally incorrect. From a legal perspective, pipeline companies with PCB-impacted air compressor systems have complied with applicable requirements imposed by the EPA prior and subsequent to the current Mega Rule. Both programs imposed strictly performance-based standards, neither of which ever required these systems to be completely purged of PCBs. As a factual matter, given the highly persistent nature of PCBs and in light of the sheer complexity and broad variability of these facilities, it is technically impossible to purge PCBs from impacted air compressor systems. Finally, to the extent that residual PCBs do remain in certain air

[151] *See generally* ENVIRON, White Paper on the EPA's Proposed Changes to the Use Authorization for PCBs in Air Compressor Systems: A Natural Gas Transmission Perspective (Aug. 2010).
[152] 75 Fed. Reg. at 17,657.

compressor systems, they present no unreasonable risk to health or the environment that would justify reconsideration of the present use authorization.

Historically, PCBs were used as a component of high flashpoint lubricants used from the 1950s through the 1970s in some air compressor systems, which, by nature, are highly complex systems—an elaborate architecture of rotating equipment, numerous small diameter piping and tubing (1/4" to 1"), and tanks of varying scale, with varying configurations and complexity. Air compressors may be multiple stage units and usually include downstream air dryers and filters. The piping is extensive and often includes lines smaller than one inch in diameter. At various points, some air compressor systems include drip bottles to collect water condensate, as well as valves to allow water condensate removal.

Under normal operations, small amounts of lubricants may travel across air compressor seals, which may become entrained in the air stream or captured in water condensate. The water and oil mixture is removed regularly from the air system and disposed of in accordance with applicable legal requirements. To the extent that PCB-containing lubricants were used in certain air compressor systems, PCBs would have traveled with the lubricants across the compressor seals as described above and into the piping.

Before promulgation of the Mega Rule, interstate pipeline companies with impacted air compressor systems undertook a number of measures to remediate systems in which PCBs were detected at a concentration of greater than 50 ppm. These measures included draining the PCB-containing lubricant and replacing it with a non-PCB substitute, often followed by flushing the piping and air tanks with solvent. Under Alternate Disposal Permits later approved by the EPA, companies were allowed to implement certain cleaning procedures at impacted air compressor systems, which were then considered non-PCB equipment. When the Mega Rule was promulgated, the EPA determined that air compressor systems containing PCB concentrations of less than 50 ppm could continue operation without taking further action to reduce PCB mass. Systems that contained PCB concentrations at or above 50 ppm also were authorized for continued use, provided they drained and replaced the PCB-impacted oil from compressor crankcases, and cleaned other components with a triple flush, double rinse procedure for internal surfaces and a continuous 4-hour flush for small diameter air compressor piping. These approaches were performance-based only. Companies were never required to re-sample the air compressor systems after cleaning was completed—sampling would be technically infeasible. That residual PCBs would remain in the system clearly was anticipated and thus deemed safe by the EPA.[153] It is therefore incorrect for the EPA to state that all PCBs should have been purged from these systems by now or to suggest that companies should be required to re-clean these systems.

In any case, it is technically impossible to "purge" PCBs from all impacted air compressor systems. First, given the persistent nature of PCBs and way lubricants interact when mixed in air compressor systems, PCBs will never be present in constant concentrations throughout the lubricant system. As a result, draining and replacement of lubricants will not reach certain pockets of higher PCB concentration lubricant.

Second, because PCB-containing lubricants may adhere to the interior surfaces of the air compressor system and its various components, flushing with solvents cannot guarantee complete removal, and long-term, low-level desorption/diffusion of PCBs into the system will persist.[154] As a result, complete removal of PCBs is possible only with complete facility

[153] *See* ENVIRON, *supra* note 151, at 4. In practice, however, given the complex configuration of air compressors, PCB concentrations tend to persist at concentrations above 1 ppm even after cleaning.
[154] ENVIRON, *supra* note 151, at 5.

replacement. While the EPA has suggested that replacement would occur after 30 years, this simply is not the case. Air compressor components have long use lives and can be maintained almost indefinitely, especially components such as piping and tanks.

Finally, to the extent that residual PCBs do remain in certain air compressor systems, the EPA already determined when promulgating the Mega Rule that PCBs in air compressor systems at concentrations of less than 50 ppm, or at concentrations above that level when coupled with performance-based cleaning, do not pose an unreasonable risk of harm to health or to the environment when it promulgated the Mega Rule.[155] The safety of this use authorization was supported by the EPA's owns studies and it will continue to be protective of health and the environment.[156]

In light of the foregoing, it is clear that the EPA's belief that all PCBs should have been purged from air compressor systems by now has no legal or factual support. Not only was purging the system never a requirement of the applicable regulations, it was never the objective. Moreover, because complete purging of air compressor systems simply is not technically possible, low levels of PCBs will remain in impacted systems for many decades to come. Indeed, continuation of the present use authorization is critical. To terminate or severely limit the use authorization would require companies that already have spent millions of dollars to clean their air compressor systems to spend hundreds of millions more to replace these systems entirely, which is the only possible way to meet more stringent limits.[157] Ultimately, such measures are entirely unnecessary because, as the EPA already has determined, residual PCBs in

[155] 63 Fed. Reg. at 35,399.
[156] ENVIRON, *supra* note 151, at 5, 8.
[157] ENVIRON, *supra* note 151, at 6-7.

air compressor systems do not present any unreasonable risk of injury to health or the environment.

B. The Use Authorization for Porous Surfaces Cannot Be Modified

In the recent ANPRM, the EPA expressed concern over air emissions from encapsulated porous surfaces, stating that the agency is concerned about continued risk to "persons" exposed to air emissions from "contaminated porous surfaces."[158] In the context of natural gas pipeline operations, porous surfaces at compressor stations that may have been impacted by PCBs may include concrete pads, floors, walls and painted metal for piping and equipment. The EPA offered no justification or other explanation as a basis for this concern.

The EPA stated in 1998 that "the use conditions specified in 761.30 (p) [for porous surfaces] will effectively prevent exposure to any residual PCBs in the contaminated porous material and therefore continued use of this material will not present an unreasonable risk."[159] Without new information to suggest the agency's previous determination was flawed, it is unclear why the EPA is now concerned about air emissions from porous surfaces that have been encapsulated in accordance with the current Mega Rule. Contrary to the EPA's apparent concern, the current standard under the Mega Rule continues to effectively protect human health and the environment and there is no legal basis for its elimination. In addition, elimination of the use authorization would be technically infeasible and impose significant, unreasonable costs on companies that have relied for years on their ability to continue using properly encapsulated porous surfaces.[160]

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[158] 75 Fed. Reg. at 17,657.
[159] 63 Fed. Reg. at 35,398.
[160] *See id.* ("EPA agrees with comments that the removal of porous materials contaminated by spills of liquid PCBs is economically burdensome and unnecessary where release of and exposure to the PCBs can be controlled.").

The Mega Rule currently requires a specific procedure be taken when porous surfaces are impacted by PCB-containing substances. Continued use of porous surfaces is authorized provided that: (1) the source of PCBs is removed or contained; (2) the porous surface is cleaned according to the double wash/rinse procedure specified in the regulation; and (3) the cleaned surface is encapsulated with either a two-layer, water-repellant solvent-resistant contrasting-color coating or a solid barrier with the cover marked.[161] The EPA determined that the use conditions specified would effectively prevent exposure to any residual PCBs in the impacted porous material and that the continued use of the material would not present an unreasonable risk to health or the environment.

Moreover, altering the use authorization for porous surfaces would be both technically infeasible and economically unreasonable. If encapsulation were no longer allowed as an option, companies effectively would be required to demolish, dispose of and restore PCB-impacted porous surfaces. While physically possible, the cost of such an undertaking would be extensive. The EPA must further consider the potential environmental impacts that would result from such activities taking place industry-wide, particularly in light of limited disposal options for PCB-impacted materials. Additional costs associated with both the removal of the heavy equipment mounted on impacted porous surfaces as well as the associated service interruptions would be much more substantial. Moreover, because the scale and configuration of pipeline company operations utilizing porous surfaces are so varied, the economic impact would be relatively disproportionate between companies.

The EPA's proposed elimination of the porous surfaces use authorization as based on an unsubstantiated concern for PCB air emissions is without legal or analytical basis. The EPA

[161] 40 C.F.R. § 761.30(p).

previously determined that the use authorization presented no unreasonable risk to health or the environment, which determination remains valid today. Moreover, because porous surfaces that may be impacted by PCBs support, at least with respect to the natural gas transmission system, large and complex air compressor systems and other pieces of equipment, the disruption to operations and service continuity and the cost burden imposed on natural gas pipeline companies would be unreasonable. As a result, the EPA must not end the current use authorization for porous surfaces.

VIII. INGAA'S RESPONSE TO THE EPA'S REQUEST FOR COMMENTS AND INFORMATION SET FORTH IN SECTION XIV OF THE ANPRM

Since INGAA is an industry trade association, INGAA's representations do not necessarily reflect the positions or answers of specific member companies.

A. Sub-Part (S): "Use in Natural Gas Transmission and Distribution Systems"

Question 1: *How many gallons of ≥ 50 ppm condensate have been removed and disposed of annually from natural gas pipelines owned by each individual gas transmission company and distribution company starting in 1998?*

Response: INGAA does not collect and maintain company information regarding pipeline liquids removal and disposal from individual member companies.

Question 2: *Do transmission companies regularly test the condensate for PCBs? If so, what is done with the PCBs when found?*

Response: INGAA members regularly sample the pipeline liquids for PCBs in classified zones (areas ≥ 50 ppm). If the sample results of the pipeline liquids are greater than or equal to 50 ppm, the pipeline liquids are disposed of as TSCA waste at a TSCA-approved disposal facility. Sampling outside of classified zones is not required under the use authorization provisions of the Mega Rule. For disposal of waste material collected in pipeline areas outside of classified zones, however, INGAA members as a general practice rely on analytical data, historical knowledge of PCB levels in their systems, and the waste-screening/acceptance criteria of regulated third-party vendors to determine whether sampling is needed prior to disposal.

Question 3: *What locations in the system have the most condensate removed?*

Response: Every transmission system is different, but as a generalization, INGAA members remove the most pipeline liquids at compressor stations.

Question 4: *What time of year is most condensate removed?*

Response: INGAA members remove pipeline liquids throughout the year. There is no discernable seasonal trend throughout the industry regarding removal activities.

Question 5: *How do natural gas transmission and distribution companies test for PCBs in dry systems?*

Response: INGAA members follow the sampling requirements set forth in the Mega Rule, which call for liquid samples under the use authorization and disposal provisions, and wipe samples for certain applications, such as abandonment of pipe.

B. Sub-Part (R): "Use of Contaminated Porous Surfaces"

Question 1: *What has the average per ton, drum, or cubic yard disposal cost been to dispose of contaminated non-liquid material (such as soil or concrete) from a spill of PCB oil containing ≥ 50 ppm each year for the last 10 years? Please differentiate costs based on PCB concentration (e.g., < 50 ppm PCB waste, ≥ 50 ppm, etc.) and based on type of disposer (e.g., landfill, incinerator, etc.).*

Response: Disposal costs represent only a small fraction of the overall costs associated with the demolition, disposal and restoration of PCB-impacted porous surfaces. The much more substantial costs are associated with both the removal of heavy equipment mounted on such impacted surfaces as well as the associated service interruptions. Accordingly, rather than dispose of contaminated non-liquid material, if a spill occurs that impacts a porous surface, INGAA members typically would comply with the option under the Mega Rule that allows for the removal or containment of the PCB source, completion of a double wash/rinse procedure to clean the surface, and encapsulation of the surface.[162]

Question 2: *How often is there a planned major outage to equipment mounted on concrete pads or floors? How long is such a planned outage?*

Response: Natural gas transmission systems are, by necessity, designed for continuous operation. Therefore, with the exception of routine maintenance, there are no planned outages of air compressor systems that are mounted on concrete pads.

C. Sub-Part (X): "Reconsideration of the Use of the 50 ppm Level for Excluded PCB Products (*e.g.*, Caulk)"

Question 1: *What should the maximum PCB concentration, if any, be for the "excluded PCB products" as defined in 40 CFR 761.3?*

Response: There should be no maximum PCB concentration for any excluded non-liquid PCB products. Any maximum PCB concentration established for other excluded PCB products should be no lower than the current 50 ppm threshold. In any case, the maximum PCB concentration threshold should be based on an application-specific assessment of the risks to health and the environment.

Question 2: *What should the minimum PCB concentration be for the "excluded PCB products" as defined in 40 CFR 761.3?*

[162] *Id.*

<u>Response</u>: The PCB concentration threshold for excluded PCB products should be no lower than the current regulatory level of 50 ppm.

<u>Question 3</u>: *Should there be a new separate use authorization for certain currently excluded PCBs found in certain products such as paint, gaskets, or caulk?*

<u>Response</u>: No, there should be no "new separate" use authorization for "currently excluded" PCB-containing products.

<u>Question 4</u>: *What types of non-liquid products (adhesives, caulk, coatings, grease, paint, rubber/plastic electrical insulation, gaskets, sealants, waxes, etc.), which were manufactured before 1979 and are currently in use, contain PCBs at concentrations between 1 ppm and 50 ppm?*

<u>Response</u>: Certain pipeline coatings and valve sealants in natural gas transmission systems contain PCBs.

<u>Question 5</u>: *What types of liquid products (pump oil, solvent, or other fluid), other than those authorized for use in 40 CFR 761.30, contain PCBs at concentrations between 1 ppm and 50 ppm?*

<u>Response</u>: Not applicable to INGAA members.

<u>Question 6</u>: *For each class of non-liquid and liquid product, what percent of the overall product market share is taken by the PCB-containing product:*

a. *What is the estimated total weight or volume of each type of product in current use?*

b. *What kinds of use has each product been applied to, on, or in?*

c. *What is the geographic distribution of each product use?*

d. *What is the average expected lifetime of the product?*

e. *When would the product normally be replaced as part of preventive maintenance?*

<u>Response</u>:

a. Unknown.

b. With respect to non-liquid products, pipeline coatings and valve sealants.

c. Unknown.

d. Due to the nature of pipeline operations, pipeline coatings and valves have a long useful life expectancy that is not limited in terms of years.

e. Pipeline coatings and valves are not replaced as part of routine preventive maintenance.

IX. CONCLUSION

To be clear, the natural gas transmission industry is fully committed to the safe and reliable operation of the natural gas pipeline system, including taking those measures necessary to address PCB-related issues in a manner that is protective of health and the environment. To ensure that the natural gas transmission industry can continue to meet its ongoing obligation to provide open, uninterrupted service to its customers, such measures must be economically reasonable and technically feasible, balancing achievable environmental benefits with the anticipated impacts to pipeline infrastructure and operations.

In light of its long history of working with the EPA on PCB-related issues, as well as numerous other environmental matters, INGAA stands ready to engage in dialogue with the agency and other stakeholders to demonstrate the transmission industry's past and present successes in removing PCBs from the pipeline system under the Mega Rule. As a result, the presence of residual PCBs in certain segments of the natural gas transmission system are even less of a concern than when the agency previously determined there was no unreasonable risk to health or the environment. Nevertheless, as established in the foregoing comments, the economic consequences of lowering or eliminating the current use authorization would severely impact the economic stability and operational integrity of the natural gas transmission system, contrary to our Nation's energy, security and climate change policies. The EPA previously acknowledged that the minimal risks associated with PCBs in the natural gas pipeline system do not justify the anticipated burden of increased regulation on the natural gas industry or society. Nothing has changed to invalidate that determination. For all of the reasons stated herein, the EPA must maintain the current use authorizations for applications related to natural gas pipeline systems, and maintain the present regulatory standard of 50 ppm.

Appendix

Excerpts Exposure Assessment for Polychlorinated Biphenyls (PCBs): Incidental Production, Recycling, and Selected Authorized Uses

<u>FINAL REPORT</u>

Volume I

Exposure Assessment for Polychlorinated Biphenyls (PCBs): Incidental Production, Recycling, and Selected Authorized Uses

EPA Contract No. 68-01-6271
Task No. 21

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Prepared for:

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May 2, 1984

exposure and that absorption of some isomers may exceed 90 percent over 24 hours, a dermal absorption rate of 100 percent was used as a worst case in the exposure scenarios unless otherwise specified.

(2) Consumer Exposures

Some of the possible host chemicals are used in formulating consumer products. Nine consumer scenarios were constructed to consider possible exposures to PCBs in most of the general types of products that could conceivably be contaminated by incidentally produced PCBs. A tenth scenario was developed to assess consumer exposure to PCBs in natural gas. These scenarios emphasize products whose potential for exposure is great because of high frequency or duration of use, again reflecting a reasonable worst case orientation. Generic exposure scenarios were developed to assess inhalation exposure to incidentally produced PCBs in moth control agents, space deodorants, paints, aerosol products, and building materials, and to assess dermal exposure to PCBs in cosmetics, printed matter, paints, textiles, and cleaning products. Ingestion of PCBs as a result of use of PCB-contaminated pesticides on agricultural products was also examined.

Levels of inhalation and dermal exposure were estimated for consumer settings using the same methods discussed previously for occupational settings. For some consumer products, it was possible to directly estimate the PCB release rate and to estimate concentrations by making assumptions about the volume of air and ventilation rate of the affected room (see Attachments Z, AA, GG, II).

liquids result in estimated exposures greater than 1.0 mg/person/year for a PCB concentration in the host chemical of 25 mg/kg. The use of protective equipment that is capable of reducing exposure by 85 percent combined with a maximum PCB level in the host chemical of 25 mg/kg would reduce most estimated dermal exposures to less than 1.0 mg/person/year.

4.4 Hypothetical Consumer Exposures to PCBs

4.4.1 Consumer Inhalation Exposures

Generic exposure scenarios were developed to assess maximum probable consumer inhalation exposures to PCBs potentially present in natural gas (Attachment Z), space deodorants and moth control agents (Attachment AA), wall paints (Attachment DD), spray paints and pesticide sprays (Attachment GG), spray cleaner/disinfectant products (Attachment GG), and plastic building materials (Attachment II). This set of scenarios is expected to address most potential consumer uses of products that may result in significant inhalation exposure to PCBs.

No use of consumer products hypothetically containing PCBs is expected to result in consumer inhalation exposures in excess of 0.5 mg/person/year, assuming PCBs are present in the host chemical at 50 mg/kg.

Only the use of plastic building materials, the continuous use of space deodorants, the use of wall paints containing PCB-contaminated resins, and the frequent use of spray products containing relatively high weight proportions of host chemicals could result in exposures in excess of 0.1 mg/person/year, assuming PCBs are present in the host chemical at 50 mg/kg.

4.4.2 Consumer Ingestion Exposures

Exposures resulting from ingestion of food containing pesticide residues were estimated to be less than 1.3×10^{-3} mg/person/year for PCB concentrations in the pesticides of 50 mg/kg (Attachment HH). A number of probable host chemicals are used as food preservatives, flavorings, or food treating products such as bleaching agents. No attempt has been made in this report to estimate potential exposures

5.0 CONCLUSIONS

The range of conditions affecting exposures to incidentally generated PCBs is extremely broad. It is possible, however, to draw some reasonable inferences about the relative magnitudes of exposures that may be associated with different release points, exposure settings, exposure routes, and possible host chemicals. The generic exposure scenarios constructed for this effort indicate the following:

- If PCBs are present in air emissions from a process at the LOQ (at the property boundary), resulting exposures are apt to be high relative to both background exposures (due to PCBs currently in ambient air) and other types of exposures hypothesized in this effort.

- If PCBs are present in aqueous effluents at the LOQ, hypothetical exposures to humans from ingestion of contaminated water or fish could be high relative to both background exposures (due to PCBs currently in food) and the estimated exposure assuming ingestion of fish containing PCBs at the current FDA tolerance level. Prediction of exposures is particularly sensitive to some widely variable site-specific parameters (e.g., flow of receiving streams), and thus it is especially difficult to make any generalizations for this case.

- Disposal of process wastes is governed by separate regulations when PCB concentrations are at or above 50 ppm or when wastes containing less than 50 ppm are disposed of in EPA approved facilities. Therefore, in this effort, disposal practices were evaluated assuming a maximum PCB concentration in wastes of 50 ppm. Inhalation exposures resulting from burning of wastes in incinerators or boilers are likely to be lower than background exposures from breathing urban air. Ingestion exposures resulting from drinking groundwater containing PCBs that have leached out of disposal sites are expected to be much lower still.

- Exposures linked to PCBs in products that contact workers or consumers are the most difficult to predict. Listed below are the exposure settings for workers and consumers and the associated PCB concentration in the host chemical that may result in an upper limit for annual worker exposures exceeding 70 mg per lifetime (average 1 mg/person/year) and an upper limit for annual consumer exposures exceeding 7 mg per lifetime (average of 0.1 mg/person/yr).

Worker inhalation exposure settings

- inhalation exposure to workers from fugitive emissions in enclosed processing plants when the process PCB concentration exceeds 17 mg/kg (Attachment M)

- inhalation exposures to workers stationed downwind of leaking equipment when the process PCB concentration exceeds 48 mg/kg (Attachment N)

- inhalation exposures to workers during the manufacture of asphalt roofing products (exposure calculation is not related to PCB concentration in process for this scenario) (Attachment V)

- inhalation exposures to workers during manual sampling of process streams when the process PCB concentration exceeds 13 mg/kg (Attachment D)

- inhalation exposures to workers while removing still bottoms when the still bottom PCB concentration exceeds 364 mg/kg (Attachment D)

Consumer inhalation exposure settings

- inhalation exposure to consumers from the residential use of natural gas with a PCB concentration in excess of 8 $\mu g/m^3$ (Attachment Z).

- inhalation exposures to consumers from pesticide spraying when the PCB concentration in the inert ingredients exceeds 29 mg/kg (Attachment GG)

- inhalation exposures to consumers from use of spray cleaning/disinfectant products when a major constituent of the product PCB concentration exceeds 14 mg/kg (Attachment GG)

- inhalation exposures to consumers from inhabiting a new home containing plastic building materials when the PCB concentration in the material exceeds 23 to 63 mg/kg (Attachment II)

- inhalation exposures to consumers from space deodorants when the PCB concentration exceeds 15 mg/kg (Attachment AA)

Worker dermal exposure settings

- dermal exposures to workers during transfer and handling operations when the PCB concentration in the host chemical exceeds 8 mg/kg (Attachment Y)

- dermal exposures to workers during maintenance operations when the PCB concentration in the host chemical exceeds 16 mg/kg (Attachment Y)

FINAL REPORT

Volume II

Exposure Assessment for Polychlorinated Biphenyls (PCBs): Incidental Production, Recycling, and Selected Authorized Uses

Appendix A : Generic Exposure Scenarios

EPA Contract No. 68-01-6271
Task 21

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May 2, 1984

Table A-1. (continued)

Exposure type	Exposure scenario	Reference attachment[a]	Estimated individual exposure[b]: during period of exposure (mg/yr)	during period of exposure (mg/kg/day)	lifetime average (mg/kg/day)	Duration of exposure[c] (years)
Consumer inhalation	• Exposure resulting from residential use of natural gas, assuming the PCB concentration in natural gas is:					
	– 8 ug/m^3	Z	0.1	3.8×10^{-6}	3.8×10^{-6}	70
	– 41 ug/m^3	Z	0.5	2.0×10^{-5}	2.0×10^{-5}	70
	• Exposure resulting from use of space deodorants assuming PCBs are present in the product at:					
	– 2 mg/kg	AA	1.3×10^{-2}	5.1×10^{-7}	5.1×10^{-7}	70
	– 25 mg/kg	AA	1.7×10^{-1}	6.7×10^{-6}	6.7×10^{-6}	70
	– 50 mg/kg	AA	3.3×10^{-1}	1.3×10^{-5}	1.3×10^{-5}	70
	• Exposure resulting from use of moth control products assuming PCBs are present in the product at:					
	– 2 mg/kg	AA	2.6×10^{-3}	1.0×10^{-7}	1.0×10^{-7}	70
	– 25 mg/kg	AA	3.2×10^{-2}	1.3×10^{-6}	1.3×10^{-6}	70
	– 50 mg/kg	AA	6.6×10^{-2}	2.6×10^{-6}	2.6×10^{-6}	70
	• Exposures resulting from painting the interior of a house assuming PBCs are present in the pigment at:					
	– 2 mg/kg	DD	1.3×10^{-5}	5.1×10^{-10}	1.0×10^{-10}	14
	– 25 mg/kg	DD	1.7×10^{-4}	6.7×10^{-9}	1.3×10^{-9}	14
	– 50 mg/kg	DD	3.3×10^{-4}	1.3×10^{-8}	2.6×10^{-9}	14
	– 150 mg/kg	DD	1.0×10^{-3}	3.9×10^{-8}	7.8×10^{-9}	14
	• Exposures resulting from painting the interior of a house assuming PCBs are present in a resin intermediate at:					
	– 2 mg/kg	DD	6.1×10^{-5}	2.4×10^{-9}	4.8×10^{-10}	14
	– 25 mg/kg	DD	7.7×10^{-4}	3.0×10^{-8}	6.0×10^{-9}	14
	– 50 mg/kg	DD	1.5×10^{-3}	5.9×10^{-8}	1.2×10^{-8}	14

ATTACHMENT Z

Hypothetical Occupational and Consumer Exposure To PCBs in Natural Gas

Z.1. Introduction

PCBs have been detected in gas pipelines, both in a condensate which collects in pools in the pipe and in the gas itself. This attachment examines the potential exposure of employees and consumers to PCBs in gas pipelines.

Z.2. PCB Contamination in the Gas Industry

In 1980, the gas industry had 1,050,000 miles of pipe; 83,200 miles were used for field and gathering operations, 266,900 miles were used for transmission; and 700,100 miles were used for distribution (AGA 1980). A field and gathering system is a network of pipelines transporting natural gas from individual wells to compressor station, processing point, or main trunk pipeline. A transmission system consists of pipelines installed for the purpose of transmitting gas from a source or sources of supply to one or more distribution centers or to one or more large volume customers, or a pipeline installed to interconnect sources of supply. A distribution system is generally mains, services, and equipment which carry or control the supply of gas from the point of local supply to and including the sales meters (AGA 1980).

Gas is moved through the pipelines by compressors. A compressor station is any permanent combination of facilities that supplies the energy to move gas at increased pressures from fields, in transmission lines, between local distribution systems, or into storage. Gate stations are locations where gas changes ownership between parties neither of which is the ultimate consumer (AGA 1980).

The transmission system for natural gas consists of a network of pipes with compressor stations at 50 to 100 mile intervals, isolation valves at 10 to 30 mile intervals, and metering and regulating stations at delivery points. Operating pressures in transmission lines typically range from 55 to 85 atm (USEPA 1981).

Distribution companies purchase gas from transmission companies and deliver it to customers. Gas is received at a gate station at 8 to 11 atm of pressure, pumped through medium pressure lines at about 3 atm pressure, and delivered to residential and small commercial users at sightly above atmospheric pressure.

Natural gas systems usually experience peak demand during the winter. In periods of low demand, transmission companies often store gas in depleted reservoirs. In periods of peak demand, the gas is compressed and injected into the pipeline at pipeline pressure. Extra compressors may be required to deliver gas from storage and from facilities such as liquid natural gas storage facilities and synthetic natural gas plants and other facilities designed to meet peak demands for natural gas.

PCBs were first identified in gas pipelines in January 1981 when a PCB-containing, oily condensate was found in the gas meters of some residential customers of a Long Island, New York, distribution company. Under the direction of EPA, 33 transmission companies undertook voluntary monitoring of condensate and natural gas to determine PCB concentrations. Twelve companies that found elevated PCB concentrations in condensate continued to supply EPA with monitoring data and developed methods to lower the PCB concentrations. EPA Regional Offices have collected data from distribution companies. PCBs in gas pipelines appear to be concentrated in certain portions of the United States, namely, the Northeast and North Central areas and California. Table Z-1 contains a summary of all the data in the possession of OTS on PCB levels in condensate.

Condensate is a mixture of heavier hydrocarbons and other liquids such as water which condense because the gas is transmitted under pressure. This condensate tends to collect in pools in the pipes,

Table 2-1. (continued)

Description	No. of attempts to collect samples[a]	Number of samples collected by PCB concentration (mg/kg) <25	25–50	>50–100	>100–500	>500–1,000	>1,000–5,000	>5,000–10,000	>10,000	No condensate[a]	Maximum concn. (mg/kg)	Volume of condensate collected[b]
G. Company G												
1. First quarter 1981	21	7	7	1	2	2	2	0	0	0	1,250	No condensate found after March 1981.
H. Company H												
1. First quarter 1983	14	2	1	2	2	0	0	0	0	7	126	0 gal. (>500 mg/kg PCBs) 715 gal. (50-500 mg/kg PCBs)
2. 1982	29	1	2	9	9	2	2	0	0	4	2,300	<5 oz. (>1,000 mg/kg PCBs) 487 gal. (>500 mg/kg PCBs) 4,464 gal. (50-500 mg/kg PCBs)
I. Company I												
1. First quarter 1983	147	73	15	4	12	8	24	0	1	10	15,500	16 gal. (>10,000 mg/kg PCBs) 5,511 gal. (1,000-5,000 mg/kg PCBs) 2,636 gal. (500-1,000 mg/kg PCBs) 5,109 gal. (50-500 mg/kg PCBs)
2. 1982	112	73	13	5	7	0	11	0	1	2	15,500	16 gal. (>10,000 mg/kg) (Volume of condensate were reported for only some of the analyzed samples.)
J. Company J												
1. First quarter 1983	15	6	6	0	1	0	0	0	0	2	220	0 gal. (>500 mg/kg PCBs) 4,819 gal. (50-500 mg/kg PCBs)
2. 1982	46	15	5	9	10	4	3	0	0	0	2,100	195 gal. (>500 mg/kg PCBs) 8,753 gal. (50-500 mg/kg PCBs)
K. Company K												
1. First quarter 1983	72	3	2	15	14	4	3	0	0	31	1,252	10,811 gal. (50-500 mg/kg PCBs)
2. 1982	136	17	6	23	35	4	8	1	0	42	5,100	230 gal. (>500 mg/kg PCBs) 42,597 gal. (50-500 mg/kg PCBs) 15,443 gal. (<50 mg/kg PCBs)

Table 2-1. (continued)

Description	No. of attempts to collect samples[a]	<25	25-50	>50-100	>100-500	>500-1,000	>1,000-5,000	>5,000-10,000	>10,000	No condensate[a]	Maximum concn. (mg/kg)	Volume of condensate collected[b]
		Number of samples collected by PCB concentration (mg/kg)										
L. Company L												
1. First quarter 1983	4	0	1	1	2	0	0	0	0	0	482	8,258 gal. (50-500 mg/kg PCBs) 1,231 gal. (<50 mg/kg PCBs)
2. 1982	10	3	1	5	1	0	0	0	0	0	158	10,258 gal. (50-500 mg/kg PCBs) 28,259 gal. (<50 mg/kg PCBs)
M. Company M												
1. First quarter 1983	19	0	0	0	0	0	7	0	1	11	27,700	5 ml. (>10,000 mg/kg PCBs) 2,883 gal. (>500 mg/kg PCBs)
2. 1982	28	0	0	0	0	0	4	2	2	20	42,394	5 oz. (>10,000 mg/kg PCBs) 2,970 gal. (>500 mg/kg PCBs)
N. Totals												
1. First quarter 1983	508	172 (33.9%)	36 (7.1%)	39 (7.8%)	47 (9.3%)	13 (2.6%)	42 (8.3%)	0	2 (0.4%)	157 (30.9%)		
2. 1982	1,312	480 (36.5%)	109 (8.3%)	132 (10.1%)	139 (10.6%)	26 (2.0%)	34 (2.6%)	10 (0.8%)	5 (0.4%)	377 (28.7%)		
3. First quarter 1981	21	7 (33.3%)	7 (33.3%)	1 (4.8%)	2 (9.5%)	2 (9.5%)	2 (9.5%)	0	0	0		
4. Total	1,841	659 (35.8%)	152 (8.3%)	172 (9.3%)	188 (10.2%)	41 (2.2%)	78 (4.2%)	10 (0.5%)	7 (0.4%)	534 (40.9%)		
II. Distribution company condensate												
A. Data collected by EPA Region III 1981	18	14	0	1	3	0	0	0	0	0	220	No data available
B. Data collected by EPA Region V 1981	27	12	0	2	8	1	4	0	0	0	1,855/ 3,000[c]	No data available

Table Z-1. (continued)

Description	No. of attempts to collect samples[a]	Number of samples collected by PCB concentration (mg/kg) <25	25–50	>50–100	>100–500	>500–1,000	>1,000–5,000	>5,000–10,000	>10,000	No condensate[a]	Maximum concn. (mg/kg)	Volume of condensate collected[b]
C. New York survey of customers – condensate found in gas meters	13	1	0	0	0	0	7	5	0	0	6,500	No data available

[a]These transmission companies attempted to collect samples of condensate at selected collection points in their systems. In many cases, they found no condensate at the collection points.

[b]The volumes listed do not in every case represent the entire volume of contaminated condensate.

[c]This sample was split and analyzed by two laboratories.

Source: Information voluntarily submitted to EPA by natural gas transmission and distribution companies.

especially at points of pressure change such as gate stations. The condensate may leak from the pipes, and the industry has installed "drip bottles" at points of condensate collection to collect these drips and leaks. Because the condensate may impede the flow of the gas, the industry drains the condensate when necessary. Since 1980, the industry has also drained and disposed of condensate as part of its voluntary PCB remedial program. Several thousand gallons of condensate are often removed at a single collection point.

The sources of PCBs in natural gas pipelines cannot be specifically identified. The two most commonly identified sources are historical ones -- the use of PCBs in lubricating oil for compressors, a practice which was discontinued by 1980, and misting of pipelines with PCBs to prevent corrosion, which occurred in the 1940s and 1950s. EPA is unable to identify with certainty all of the companies that used PCBs. However, many companies that never used PCBs have found high levels of PCBs in their condensate. This suggests either that their pipelines have been contaminated by PCBs received from their suppliers or that there is an unidentified source of PCB contamination.

The data summarized in Table Z-1 suggest that PCBs move through the pipes. The transport mechanisms may be movement of condensate as a liquid or as an aerosol or vapor in the gas stream or a combination of all three. The volumes of condensate and PCB concentrations in condensate collected at a given collection point sometimes vary dramatically over time. Where PCB concentrations in condensate have exceeded 50 mg/kg, companies have attempted to prevent the spread of PCBs by installing devices such as filter/separators to remove the condensate. The data examined by EPA cover too short a time period to determine whether the industry's attempts to reduce PCB levels have been successful.

Table Z-2. Summary of Hypothetical Human Exposures to PCBs in Natural Gas

Exposure type	Exposure scenario	Estimated individual exposure: during period of exposure (mg/yr)	Estimated individual exposure: during period of exposure (mg/kg/day)	Estimated individual exposure: lifetime average daily dose (mg/kg/day)	Duration of exposure (yrs)
Occupational inhalation	• Removal of condensate and cleanup of spills—employee exposed 240 days/year.				
	- 2 mg/kg	2.5×10^{-2}	9.8×10^{-7}	5.4×10^{-7}	38.5
	- 25 mg/kg	3.2×10^{-1}	1.3×10^{-5}	6.9×10^{-6}	38.5
	- 50 mg/kg	6.7×10^{-1}	2.6×10^{-5}	1.4×10^{-5}	38.5
	• Removal of condensate and cleanup of spills—employee exposed 12 days/yr.				
	- 2 mg/kg	1.3×10^{-3}	5.1×10^{-8}	2.8×10^{-8}	38.5
	- 25 mg/kg	1.6×10^{-2}	6.3×10^{-7}	3.5×10^{-7}	38.5
	- 50 mg/kg	3.3×10^{-2}	1.3×10^{-6}	7.2×10^{-7}	38.5
Occupational dermal	• Removal of condensate and cleanup of spills—employee exposed 240 days/yr				
	- 2 mg/kg	6.7×10^{-1}	2.6×10^{-5}	1.4×10^{-5}	38.5
	- 25 mg/kg	8.4	3.3×10^{-4}	1.8×10^{-4}	38.5
	- 50 mg/kg	16.7	6.5×10^{-4}	3.6×10^{-4}	38.5
	• Removal of condensate and cleanup of spills—employee exposed 12 days/yr				
	- 2 mg/kg	3.3×10^{-2}	1.3×10^{-6}	7.2×10^{-7}	38.5
	- 25 mg/kg	4.2×10^{-1}	1.6×10^{-5}	8.8×10^{-6}	38.5
	- 50 mg/kg	8.4×10^{-1}	3.3×10^{-5}	1.8×10^{-5}	38.5

Z.3. Occupational Exposure to PCBs in Gas Pipelines

There are two routes by which employees may be exposed -- dermal exposure to PCBs in condensate and inhalation exposure either to PCBs in fugitive emissions of natural gas or to PCBs volatilized from condensate.

Because natural gas is flammable and toxic, the natural gas pipeline system is necessarily a closed system. The most likely routes of exposure are dermal and inhalation exposure during cleanup of leaks and spills, maintenance and cleaning of equipment, and removal of PCB-contaminated condensate. This exposure assessment examines potential exposure to PCBs in condensate at concentrations of 50 mg/kg, 25 mg/kg, and 2 mg/kg. Estimated exposure levels are summarized in Table Z-2.

Z.3.1. Dermal Exposure

Maximum hypothetical dermal exposure to PCBs in condensate was estimated using the following assumptions:

- All condensate contains PCBs at concentrations of 50, 25, or 2 mg/kg.
- Frequency of exposure is 240 days/year or 12 days/yr.
- Exposure continues for 38.5 years.
- 100 percent of the PCBs contacting the skin are absorbed.
- 870 cm^2 of skin (surface area of both hands) are coated with a film of condensate with a thickness of 0.0016 cm (Versar 1983).
- The density of the condensate is 1 g/cm^3.

Except for the assumption on density of the condensate, these assumptions were used in the exposure assessment for hydraulic fluid in Volume IV of this document.

The following equation was used to estimate dermal exposure:

$$A = F \times S \times E \times R$$

where A = Annual PCB dermal exposure (mg/yr)

F = Frequency of exposure (times/yr)

S = Skin area exposed (cm^2)

E = PCB exposure level (mg/cm^2)

R = Fraction of available PCBs absorbed through the skin (100 percent).

For liquids,

$$E = T \times L \times C$$

where T = Liquid film thickness on skin (cm)

L = Density of liquid (kg/cm^3)

C = PCB concentration in the liquid (mg/kg).

Assuming that all condensate contains PCBs at a concentration of 50 mg/kg, maximum hypothetical dermal exposure to PCBs in condensate is estimated to be 16.7 mg/year, and the lifetime average daily dose* for a 70 kg man over a 38.5 year exposure period is 3.6×10^{-4} mg/kg/day. This is slightly lower than maximum hypothetical exposure to PCBs in hydraulic fluids because the density of natural gas condensate was assumed to be lower than the density of hydraulic fluid.

It is quite unlikely that any employee will be exposed to 16.7 mg/year of PCBs for several reasons. First, it appears from data submitted by gas transmission companies that draining of condensate does not occur daily, but rather approximately monthly. Often companies have found no condensate at collection points during some periods of the year. Second, PCB concentrations vary, and it is unlikely that condensate will uniformly contain concentrations of 50 mg/kg. Third, exposure to condensate containing 50 mg/kg PCBs for 38.5 years is unlikely. Because no existing PCB sources have been identified, PCB concentrations in condensate should decrease as PCBs are removed from the

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*Calculated by:
mg/yr x 38.5 yrs (of exposure)/life ÷ 25,550 days/life ÷ 70 kg

pipelines. Fourth, many companies state that they require employees to wear protective clothing when handling condensate. Fifth, the draining procedure is at least partially enclosed. If condensate containing concentrations of PCBs of 50 mg/kg or less is excluded from the TSCA ban, however, companies may cease to require protective equipment and special handling of condensate.

The dermal exposure level estimated under an alternative scenario which assumes exposure to condensate 12 times a year is 0.8 mg/year, and the lifetime average daily dose for a 70 kg man over a 38.5 year period is 1.8×10^{-5} mg/kg/day.

Z.3.2. Inhalation Exposure

Inhalation exposure to PCBs evaporating from condensate was estimated using the following assumptions:

- The maximum concentration of PCBs in air above condensate containing 50 mg/kg PCBs is 2.9×10^{-4} mg/m^3 at 25°C. If the PCB concentration in the condensate is 25 mg/kg or 2 mg/kg, maximum airborne concentrations of PCBs are 1.4×10^{-4} mg/m^3 or 1.1×10^{-5} mg/m^3, respectively (see Attachment D).
- An individual is exposed 8 hours/day either 240 days/year or 12 days/year (see discussion of assumptions for estimating dermal exposure).
- The breathing rate is 1.2 m^3/hour.
- Exposure continues for 38.5 years.
- 100 percent of the PCBs inhaled are absorbed.

Inhalation exposure is calculated with the following equation:

$$B = F \times I \times E \times D$$

where

B = annual PCB inhalation exposure (mg/yr)

F = Frequency of exposure (days/yr)

I = Inhalation rate (m^3/hr)

E = PCB exposure level (mg/m^3)

D = Duration of exposure (hrs/day).

Maximum hypothetical inhalation exposure to PCBs vaporizing from condensate containing concentrations of 50 mg/kg PCBs is 0.67 mg/year if exposure occurs daily and 0.033 mg/year if exposure occurs monthly. The associated lifetime (average daily dose* for a 70 kg man over a 38.5 yr exposure period is 1.4×10^{-5}. For the reasons stated in the section on dermal exposure, these estimated exposure levels are believed to be much higher than actual exposure levels.

It is assumed that fugitive emissions of natural gas are well controlled in order to prevent fires and explosions and that exposure to PCBs from this source is negligible.

Z.4. Consumer Exposure

When PCBs were discovered in natural gas pipelines, there was major concern that widespread exposure of natural gas customers might occur. In 1980, the natural gas industry had 43,300,000 residential customers. Average annual national consumption per customer was 111.4 MMBtu (3,080 m^3). The states with the highest annual consumption per customer were Alaska, 216.9 MMBtu (6,000 m^3), and Michigan, 172.8 MMBtu (4,780 m^3) (AGA 1980).

Concentrations of PCBs found in natural gas, indoor air of residences using natural gas, and indoor air of control residences that do not use natural gas are summarized in Table Z-3. There is no evidence that natural gas contributes to the PCB level in residential indoor air.

A maximum hypothetical exposure to PCBs was calculated using the following assumptions:

- A residence uses 4,780 m^3/year of natural gas.

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*Calculated by:
mg/yr x 38.5 yrs (of exposure)/life ÷ 25,550 days/life ÷ 70 kg

Table Z-3. PCBs in Natural Gas and Indoor Air

Description	Reporting period	Samples analysed	No. of times PCBs detected	Concentrations (μg/m³) Min.	Mean[a]	Max.	Comments
I. Natural gas in transmission lines							
A. Company A	6-2-82 to 12-15-82	9	0				Detection limit = 0.2 μg/m³. Associated condensate found with 6 samples. PCB concentration ranged from 1 mg/kg to 3,577 mg/kg; mean = 1,247 mg/kg.
B. Company B	1-82 to 4-83	9	0	<0.1		<3.7	Detection limits were about 3.5 μg/m³ for 6 samples and 0.1 μg/m³ for 3 samples. No condensate was found at any of the sampling points.
C. Company C	2-24-83	1	0				Detection limit in gas = 10 μg/m³; 14.1 mg/kg of PCBs found in associat liquid condensate.
	9-28-82, 9-29-82	2	0				Detection limit in gas = 0.04 μg/m³. No condensate found.
	2-22-83 to 2-23-83	2	0				Detection limit = 10 μg/m³. PCB concentration in associated condensate <5 mg/kg.
	2-26-82 to 9-29-82	7	2	<0.04	0.53	0.70	Detection limit = 0.04 μg/m³ or 0.1 μg/m³. PCB concentration in associated condensate <10 mg/kg.
D. Company D	8-5-82 to 2-9-83	9	0		<17		Insufficient volume of condensate found for analysis.
E. Company E	2-11-82 to 2-1-83	11	0	<0.08		<0.143	No condensate found.

Table Z-3. (continued)

Description	Reporting period	Samples analysed	No. of times PCBs detected	Concentrations ($\mu g/m^3$) Min.	Mean[a]	Max.	Comments
I. Natural gas in transmission lines (continued)							
F. Company F	8-2-82 to 2-7-83	6	0		<17		No condensate found or insufficient quantity for analysis.
G. Company G	10-17-82 to 1-21-83	8	4	<0.1	381	1,050	Detection limit = 0.1 to 20 $\mu g/m^3$. Levels in the four samples where PC[illegible] were detected were 1.4, 3.5, 470, a[illegible] 1,050 $\mu g/m^3$. No condensate found.
H. Company H	5-25-82 to 3-22-83	20	9	<0.02	30	257	Detection limit = 0.02 $\mu g/m^3$. Mean of samples where PCBs were detected 1.1 $\mu g/m^3$ if the 257 $\mu g/m^3$ measurement is excluded. There was 1 oz. of condensate with a PCB concentration of 2,300 mg/kg found [illegible] the point where 257 $\mu g/m^3$ of PCBs was measured in the natural gas. N[illegible] other condensate was found.
I. Company I	9-21-81 to 3-22-83	24	7	<2	42	260	Detection limit = 2.0 $\mu g/m^3$.
J. Company J	No data reported						
K. Company K	2-10-82 to 3-22-83	15	0				Detection limit = 0.004 $\mu g/m^3$. No condensate found for 7 of the samples. 1 to 150 ml of condensate collected at remaining sample point with PCB concentrations from 61 mg/ to 159 mg/kg.
L. Company L	6-8-82 to 12-22-82	3	2	<0.2	10	16.3	Detection limit = 0.2 $\mu g/m^3$.

Table Z-3. (continued)

Description	Reporting period	Samples analysed	No. of times PCBs detected	Concentrations ($\mu g/m^3$) Min.	Mean[a]	Max.	Comments
I. Natural gas in transmission lines (continued)							
M. Company M	2-22-82 to 2-28-83	12	0				Detection limit = 0.002 $\mu g/m^3$. No condensate found.
N. Totals	9-81 to 4-83	138	24	<0.004	71	1,050	Mean, including samples where PCBs were not detected set equal to zero, = 15.3 ug/m^3. If concentrations in samples where PCBs were not detected are set equal to one-half the detection limit, mean = 18.6 ug/m^3
II. Natural gas in distribution lines							
A. San Francisco area	4-81 to 6-81	21	0	<0.2		<1	Data submitted to EPA Region IX by a distribution company. Detection limits = 0.2 $\mu g/m^3$ or 1 $\mu g/m^3$.
B. New York State							
1. New York State monitoring survey - 12 participating distribution companies.[c]	4-82 to 1-83						Data submitted by several distribution companies in New York to the New York Department of Health.
• Natural gas at gate stations - New York State monitoring		205	66	<0.02	0.71[b]	51	Detection limits = 0.02 $\mu g/m^3$ to 0.8 $\mu g/m^3$.
• Natural gas at regulator stations in distribution systems		31	11	<0.04	0.53[b]	6.3	Detection limits = 0.04 $\mu g/m^3$ to 0.2 $\mu g/m^3$. Nine utilities obtained samples.

Table Z-3. (continued)

Description	Reporting period	Samples analysed	No. of times PCBs detected	Concentrations ($\mu g/m^3$) Min.	Mean[a]	Max.	Comments
• Natural gas in service lines to residences		51	18	<0.05	0.44[b]	4.30	Detection limits = 0.05 $\mu g/m^3$ to 1 $\mu g/m^3$.
II. Natural gas in distribution lines (continued)							
2. Survey of customers by a New York distribution company							
• Natural gas in service lines to residences of customers where condensate was found in gas meters		63	26	<0.1	8	23	Detection limits = 0.1 to 13 $\mu g/m^3$. Mean detection limit = 1.4 $\mu g/m^3$.
• Natural gas in service lines to residences of customers where condensate was not found in gas meters		178	103	<0.06	6.4	41	Detection limits = 0.03 to 9 $\mu g/m^3$.
III. Indoor air							
A. San Francisco area owners of gas ranges	9-4-81 to 9-7-81						Data submitted to EPA's Region IX by a distribution company.
1. Background kitchen air		12	9	<0.01	0.02	0.04	Detection limits = 0.01 $\mu g/m^3$.
2. Air with range operating		12	8	<0.01	0.035	0.07	Detection limits = 0.01 $\mu g/m^3$ except for one sample where detection limit = 1 $\mu g/m^3$ because of interfering compounds.

Table 2-3. (continued)

Description	Reporting period	Samples analysed	No. of times PCBs detected	Concentrations ($\mu g/m^3$) Min.	Mean[a]	Max.	Comments
III. Indoor air (continued)							
B. New York State							
1. New York State monitoring survey - 12 participating distribution companies[c]	4-82 to 1-83						
• Kitchen air - customers with gas ranges		53	10	<0.01	0.08[b]	0.70	Detection limits = 0.01 to 0.1 $\mu g/m^3$.
- controls (no use of natural gas)		50	11	<0.01	0.14[b]	1.08	Detection limits = 0.01 to 0.1 $\mu g/m^3$.
• Air above operating range		53	9	<0.01	0.07[b]	0.25	
2. Survey of customers by a New York distribution company							
• Kitchen air - Residences of customers where condensate was found in gas meters		62	0	<0.05		<5	Detection limits = 0.05 to 5 $\mu g/m^3$.
- Residences of customers where condensate was not found in gas meters		115	0	<0.02		<0.8	Detection limits = 0.02 to 0.8 $\mu g/m^3$.
• Air above gas range - Residences of customers where condensate was found in gas meters		14	0	<0.1		<0.5	Detection limits = 0.1 to 0.5 $\mu g/m^3$.

Table Z-3. (continued)

Description	Reporting period	Samples analysed	No. of times PCBs detected	Concentrations ($\mu g/m^3$) Min.	Mean[a]	Max.	Comments
- Residences of customers where no condensate was found in gas meters		48	2	0.2	0.2	0.2	

[a] Unless otherwise specified, the mean is the mean of all samples where PCBs were detected.

[b] The mean represents the mean of all samples with concentrations set equal to one-half of the detection limit for those samples where no PCBs were detected.

[c] Source: New York State Natural Gas Utilities (1982).

Source: Information submitted voluntarily to EPA by natural gas transmission and distribution companies, unless otherwise noted.

- All of the gas contains PCBs at concentrations of 41 ug/m^3 (the highest concentration measured in natural gas service lines to residences) or 8 ug/m^3 (the highest mean PCB concentration in gas in service lines found in 3 studies). (See Table Z-3, II.)

- None of the PCBs are directly vented to outdoor air; all of the PCBs are released into an indoor air volume of 230 m^3. This is the weighted average of the estimated volumes of 4- and 6- room dwellings (JRB 1982).

- The air exchange rate is assumed to be 0.87 changes/hr. This is the weighted average of the air exchange rates for 4- and 6- room dwellings (JRB 1982).

- An individual spends 73 percent of his or her time at home (Versar 1982).

- Average inhalation rate is 0.79 m^3/hr (Versar 1982).

The quantity of PCBs entering the home is:

4,780 m^3 of natural gas x 41 ug/m^3 = 195,980 ug/yr.

If the PCBs are assumed to be released at a steady rate throughout the year, they will be diluted by a volume of air estimated as follows:

230 m^3 x 0.87 exchanges/hr x 24 hrs/day x 365 days/year = 1.75×10^6 m^3/yr

The fact that the gas is consumed at different rates throughout the year will not affect the final exposure estimate.

Average concentration of PCBs in indoor air is estimated to be:

$$\frac{195{,}980 \text{ ug/yr}}{1.75 \times 10^6 \text{ m}^3\text{/yr}} = 0.1 \text{ ug/m}^3$$

Yearly inhalation exposure to this concentration is estimated as follows:

$$0.1 \text{ ug/m}^3 \times 0.79 \text{ m}^3\text{/hr} \times (24)(0.73) \text{ hr/day} \times 365 \text{ day/yr} = 500 \text{ ug/yr.}$$

Continued exposure at this level for 70 years results in an average lifetime daily dose of 2×10^{-5} mg/kg/day for a 70-kg individual.

If the PCB concentration in the natural gas is assumed to be 8 ug/m^3, estimated yearly exposure is 0.1 mg/yr and lifetime average daily dose is 3.8×10^{-6} mg/kg/day.

These maximum hypothetical exposures are likely to be much higher than actual exposure for several reasons:

- PCBs in gas pipelines move around, and concentrations in natural gas change with time. Thus it is unlikely that any individual could be exposed to these high concentrations for a 70-year lifetime.

- Transmission and distribution companies are removing PCBs from their pipelines. The concentration of 8 ug/m^3 used in this assessment came from a study of air inside residences where PCB-laden condensate was found in gas meters. This condensate contained PCBs at very high levels (1,000 to 10,000 mg/kg) (see Table Z.1-IIC). If PCBs in condensate are reduced to less than 50 mg/kg, concentrations in the natural gas and consumer exposure should be greatly reduced.

- There is no evidence that PCBs at the levels estimated are escaping into residences. The PCB indoor air levels in homes that use natural gas supplied by pipelines containing PCBs are about the same as levels in homes that do not use natural gas (see Table Z-3, III).

A final issue is whether PCBs passing through the flame of a gas range or furnace will form polychlorinated dibenzofurans (PCDFs). PCDFs are toxic chemicals that have been found in the soot formed during combustion of PCB transformer fluid (Versar 1984). A study of the pyrolysis in the presence of air of 2,4,5,2',4',5'-hexachlorobiphenyl, 2,4,6,2',4',6'-hexachlorobiphenyl, and Aroclor 1254 showed the optimum temperature for formation of PCDFs to be below 700°C. At 700°C and above, complete decomposition (greater than 99.9 percent) of the PCB molecule occurred (Buser et al. 1978). The temperature of the flame produced by combustion of natural gas is 1,700°C to 1,900°C (Knisely 1969). There should be no PCDF formation under these conditions.

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