

Richard M. Husband, Esquire
10 Mallard Court
Litchfield, NH 03052

February 25, 2016

VIA E-MAIL (rulemaking@sec.nh.gov)

Pamela G. Monroe, Administrator
N.H. Site Evaluation Committee
21 South Fruit Street, Suite 10
Concord, NH 03301

Re: Rules Related to Certificates of Site and Facility, Site 300

Dear Administrator Monroe:

This letter provides comments in response to the Site Evaluation Committee (“SEC”)’s “Request for Advance Public Comment on Subject Matter of Possible Rulemaking” (“Comment Request”), enclosed as Appendix II-A to SEC Chairman Honigberg’s January 25, 2016 correspondence available at the URL http://www.nhsec.nh.gov/projects/2016-01_rulemaking/2016-01.htm. For those copied on this letter, the comment deadline is February 29, 2016.

Specifically, I respond to the following text of the Comment Request, pertaining to your determination:

“The Administrator of the Committee has reviewed the recently adopted rules and determined that there are areas specified in RSA 162-H: 10-b, II, that are not fully addressed ...”

The Comment Request then goes on to cite specific provisions of RSA 162-H: 10-b, II that the SEC would particularly like to receive public input on with respect to the SEC’s Site 300 rules regarding high pressure gas pipelines: “appropriate setbacks to mitigate potential health and safety impacts; pipeline decommissioning plan requirements; specific criteria to maintain property owners’ ability to use and enjoy their property; project-related sound and vibration impact assessments; and application requirements to ensure quality construction that minimizes safety issues.” However, your deficiency determination is not limited to these specific provisions of RSA 162-H: 10-b, II, which identifies all of the following to be addressed in the SEC’s rules:

“II. For the adoption of rules, pursuant to RSA 541-A, relative to the siting of high pressure gas pipelines, the committee shall address the following:

- (a) Impacts to natural, scenic, recreational, visual, and cultural resources.
- (b) **Health and safety impacts**, including but not limited to, proximity to high pressure gas pipelines that could be mitigated by appropriate setbacks from any high pressure gas pipeline.
- (c) Project-related sound and vibration impact assessment prepared in accordance with professional standards by an expert in the field.
- (d) Impacts to the environment, air and water quality, plants, animals, and natural communities.
- (e) Site fire protection plan requirements.
- (f) Best practical measures to ensure quality construction that minimizes safety issues.
- (g) Best practical measures to avoid, minimize, or mitigate adverse effects.
- (h) Criteria to maintain property owners' ability to use and enjoy their property.”

Others may wish to comment on SEC rule language that should be fleshed out with respect to the different matters specifically flagged for comment above, but this letter addresses the RSA 162-H: 10-b, II subsection (b) language in bold above, “Health and safety impacts.” In this regard, **I urge the inclusion of a Site 300 requirement for a comprehensive health impact assessment (“CHIA”) with all applications pertaining to high pressure gas pipelines and/or all associated “energy facilities,” as defined under RSA 162-H:2, VII and Site 102.19.**

First, this letter addresses the need for such a CHIA requirement. Second, it proposes possible SEC Site rule language concerning the requirement.

THE NEED FOR THE CHIA REQUIREMENT

As readers of this letter may be aware, Governor Hassan recently, and commendably, took the initiative on this topic by requesting that the Federal Energy Regulatory Commission (“FERC”) “consider requiring a health impact assessment as part of the review of the Northeast Energy Direct (NED) Project,” a/k/a the Kinder Morgan or Tennessee Gas pipeline proposed to run through southern New Hampshire. A copy of the governor’s February 10, 2016 letter in this regard is attached hereto as Exhibit “A.” While the governor represents citizens on both sides of the NED Project, just as with the “Opioid Crisis” and other matters pertaining to the health and safety of New Hampshire citizens, she is understandably determined that our well-being be of paramount concern. In her attached letter, Governor Hassan addresses the issue in clear, emphatic terms:

“It goes without saying that the health of our children and families is critically important and we have long fought to create a healthier environment for all of our citizens. While the Environmental Impact Statement (EIS) will assess the potential impact of the project on water resources and air quality, among other issues, my understanding is that the EIS process may not fully capture health impacts.

An independent and comprehensive health impact assessment would allow for a thorough review of the project and a complete understanding of any potential negative health effects that may be caused by the construction and operation of the NED pipeline and could provide important baseline information upon which to assess potential future health impacts.

Protecting the health of our citizens is one of one of the most important roles of any local, state or federal government entity. A health impact assessment would help to ensure that we are fulfilling our obligation to our citizens to ensure that they have a healthy environment to live, work, and raise their families ...”

I am not suggesting that Governor Hassan has advocated an SEC CHIA requirement. However, as New Hampshire has no ability to enforce any CHIA requirement by the FERC with respect to the NED Project application, or any high pressure gas pipeline and associated energy facilities application, it would behoove the state to impose such a requirement in SEC proceedings to ensure that a CHIA is undertaken, for all of the same reasons cited by the governor.

A white paper just released February 20, 2016 by physicians and other professionals, providing a rationale for and description of a proposed CHIA requirement at the state level for evaluating applications for permits and certificates concerning natural gas transport infrastructure proposals in New York (the “White Paper”), is attached hereto as Exhibit “B.”¹ Generally very useful and instructive, this paper confirms that Governor Hassan is correct about the lack of an adequate health impact assessment under the FERC’s EIS requirements. As stated in the White Paper:

“the typical EIS:

- Does not consider the human health impacts of the project; and when it does, the analysis is narrow
- Does not encompass human health in the ‘description of the affected environment.’ As a result, there are no baseline rates of potentially impacted health problems, no identification of drivers of those problems, no ‘consequences of the alternatives’ in terms of human health -- direct, indirect, or cumulative health risks are not systematically identified or analyzed
- Does not review pertinent medical research and public health studies
- Rarely involves health experts and officials
- Rarely proposes the ‘no action’ alternative or mitigation measures to protect and promote health

Further, the typical regulatory agency approach estimates the total short-term and long-term emissions directly sent into air or water by the project under consideration. Estimated total emissions are then compared with Federal or State standards for ‘acceptable’ emissions. If the estimated levels fall below critical thresholds, the project is assessed as having a non-significant health impact. This approach is inadequate. For example, the following are but three examples of impacts that the typical approach presently does not include:

- Emission spikes. Regulatory agencies measure emissions in terms of averages taken over numerous short (for example, one hour or less) or long-term intervals (for example one or more days). Recent studies have found that these averages do not reveal the occurrence of very high levels of “peak” emissions that may occur at irregular intervals. These peaks may have serious adverse health impacts that are not captured by averaging over longer periods of time. A comprehensive assessment performed according to public health professional standards would capture information on peak emissions and their consequent health implications.
- Dynamic evolution of emissions. Regulatory agencies take a very local and static view of toxic emissions, assessing them in isolation from each other and only at the time and place immediately adjacent to their source. Many if not most standards are based on single chemical emission, while under most circumstances it is a mixture of different chemicals that are emitted. In addition, any single emission can disperse widely, evolve, and combine with other emissions and atmospheric conditions and become reabsorbed into distant water and soil. Only a

¹ It is my understanding that the SEC has already received, or may soon receive, the White Paper in one or more other public comment letters submitted in response to the Comment Request.

comprehensive health assessment can properly evaluate the full range of emission impacts.

- Downstream and upstream impacts. Regulatory agencies restrict their assessment of impacts to the operations of the project in question. However, pipeline impacts extend far beyond pipeline operations. Pipelines are a “midstream” structure, placed between the start-point of gas well production sites and the endpoint of commercial or residential consumption. Adding a pipeline has the impact of expanding both production and consumption; and many studies have reported that the endpoint use of pipeline-provided gas in residential stoves has adverse impacts on respiratory function. Only the CHIA component of an environmental impact assessment would, correctly, view this as a pipeline impact.

The above examples are not exhaustive ... “

See attached Exhibit “B,” pp. 1-2.

As noted by the National Conference of State Legislatures (“NCSL”):

“Use of [health impact assessments] as a decision-making tool in the United States is a growing practice. State legislators are exploring how to incorporate [health impact assessments] into state laws and policies. The Massachusetts state legislature included [health impact assessments] in their transportation modernization act. The California and Maryland legislatures considered integrating [health impact assessments] into land-use planning. The Washington legislature required an [health impact assessment] for a specific project, the rebuilding of the Lake Washington Bridge. In Alaska, [health impact assessment] legislation was introduced, but not enacted; instead the Alaska Department of Health and Social Services, as part of the state’s multi-agency permitting process, uses [health impact assessments] to inform the state and local community of potential health effects during the planning of large projects. Alaska’s [health impact assessments] are integrated into state permitting activities and federal studies for oil and gas and mining projects ...”

See <http://www.ncsl.org/research/environment-and-natural-resources/an-analysis-of-state-health-impact-assessment-legislation635411896.aspx>.

Additional precedent for fossil fuel CHIAs is discussed in pages 8-10 of the White Paper. *See id.*, attached Exhibit “B.” CHIAs are especially invaluable with regard to assessing proposed natural gas infrastructure:

“Incorporating a CHIA into an environmental assessment of a proposed natural gas transport infrastructure project or a proposed policy relating to natural gas transport infrastructure is essential since the CHIA component informs decisionmaking by, among other things, identifying potential risks and benefits of the proposal and making recommendations to minimize risks, maximize benefits, address data gaps, and establish a monitoring framework.”

See id., p. 3.

In particular, CHIAs are necessary to increase our understanding of the health effects caused by planned and unplanned natural gas releases resulting from proposed natural gas infrastructure, and the cumulative health impacts associated with the expansion of existing natural gas infrastructure. *See* attached Exhibit “B,” pp. 4-8. The importance of increasing this understanding cannot be emphasized enough, for “[p]ipeline ruptures occur even in newly constructed pipelines” and citizens exposed to natural gas “have reported health issues ranging from dizziness, sinus disorders, bronchitis, and other respiratory symptoms to depression, nausea, fatigue, headaches, anxiety, difficulty concentrating, and cancer ...” *Id.*, pp. 6-7.

Ultimately:

“The CHIA component will lead to recommendations for health-based mitigation (including the potential denial of permits or imposition of permit limitations), additional or new regulations, education programs, monitoring, and further study and potentially risk assessment(s).”

See attached Exhibit “B,” p. 14.

POSSIBLE SEC SITE RULE LANGUAGE REGARDING A CHIA REQUIREMENT

In 2011, the National Academies Press released a 208 page document authored by the Committee on Health Impact Assessment; National Research Council, titled “Improving Health in the United States: the Role of Impact Assessment,” which is available for download by login as a “Guest” at the URL http://www.nap.edu/download.php?record_id=13229. Chapter 3 of this document, titled “Elements of a Health Impact Assessment,” provides very helpful topical discussions that could be used by the SEC to formulate Site rule language pertaining to a CHIA requirement, including:

<u>Topic</u>	<u>Beginning Page</u>
Categories of Health Impact Assessment	44
Definition of Health Impact Assessment.....	45
Process for Health Impact Assessment.....	47

In terms of the first topic noted above, a CHIA is the highest category level of a health impact assessment (“HIA”)—the other two generally recognized categories being “rapid” and “intermediate” health impact assessments—“most commonly differentiated from rapid and intermediate HIAs by the scope of potential impacts and the need for collection of new primary data.” *See* p. 44 at http://www.nap.edu/download.php?record_id=13229. As noted in the White Paper, the scope of potential impacts to be examined with natural gas infrastructure applications is certainly “comprehensive”:

“The potential health impacts that should be examined through the systematic approach of a CHIA include, but are not limited to, those potentially resulting from or relating to:

- air pollution
- water contamination
- soil contamination
- exposure to endocrine-disrupting and other chemicals

- waste management
- radiation exposure
- spills, accidents
- road safety
- social concerns such as housing, community character, schools, substance abuse and infectious diseases
- economic issues such as employment, home value, health costs, loss of productivity
- health infrastructure including availability of insurance
- justice concerns such as vulnerable populations and equality
- synergistic and cumulative effects of multiple stressors”

See attached Exhibit “B,” p. 14.

In terms of the general definition of HIAs, they are consistently defined in almost the exact following words:

“HIA is a systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of the effects within the population. HIA provides recommendations on monitoring and managing those effects.”

See p. 46 at http://www.nap.edu/download.php?record_id=13229; see also NCSL definition at <file:///C:/Users/User/Desktop/CHIA/NCSL%20definition%20of%20HIA%20and%20An%20Analysis%20of%20State%20Health%20Impact%20Assessment%20Legislation.pdf>.

I would therefore propose defining a CHIA under Site 100 (between the current definitions under Site 102.16 and Site 102.17), along the following lines:

“Comprehensive Health Impact Assessment (CHIA) means a systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of the effects within the population. CHIA provides recommendations on monitoring and managing those effects. Unless otherwise ordered by the SEC for good cause shown and after public comment, the potential health effects to be included in a CHIA must include, but are not limited to, those potentially resulting from or relating to: air pollution; water contamination; soil contamination; exposure to endocrine-disrupting and other chemicals; waste management; radiation exposure; spills, accidents; road safety; social concerns such as housing, community character, schools, substance abuse and infectious diseases; economic issues such as employment, home value, health costs, loss of productivity; health infrastructure including availability of insurance; justice concerns such as vulnerable populations and equality; synergistic and cumulative effects of multiple stressors.”

The third topic at page 47 of “Improving Health in the United States: the Role of Impact Assessment,” noted on page 5 above—the process for developing a HIA—is almost universally considered to involve six phases. See *id.* Again, as discussed in the White Paper:

“The first two steps determine the tools to be used in the following four.

1. **Screening** –determines what policy/regulatory requirements would the CHIA inform. Identify lead(s) and partners
2. **Scoping** – develops the framework for the CHIA component; identifies the important possible health effects, affected populations, and available evidence. Identifies budget. Includes the following steps/tools:
 - Literature search and gathering of opinions from medical and public health experts, scientists, and engineers, as well as economists and sociologists
 - Identify stakeholders and their information needs
 - Identify and prioritize stressors which might lead to health impacts
 - Identify the boundaries of the potential impact
 - Specify budget
 - Use the above information to identify methods and tools for data collection
3. **Assessing risks and benefits** – analyzes baseline conditions and predicts potential effects
4. **Developing recommendations** – develops human health-based recommendations and a feasible plan for implementing them
5. **Reporting** – produces the text to be included in the DEIS and FEIS; disseminates the DEIS and FEIS containing, respectively, the interim and final versions of that text to decisionmakers, the public, and other stakeholders
6. **Monitoring and evaluating** – determines the extent to which inclusion of CHIA in the EIS added value to it, identifies the obstacles to research, and monitors outcomes of implementing decision”

See attached Exhibit “B,” p. 3 (emphasis added). See also NCSL discussion at <http://www.ncsl.org/research/environment-and-natural-resources/an-analysis-of-state-health-impact-assessment-legislation635411896.aspx>.

I would therefore propose adding language along the following lines to Site 300, as perhaps Site 301.08(d)(6):

“(6) For all applications concerning high pressure gas pipelines and/or associated energy facilities—such as, but not limited to, compressor stations— *involving the submission of an Environmental Impact Statement (EIS) to any federal agency, including the Federal Energy Regulatory Commission, or the submission of any other environmental assessment to any federal or state agency*², a comprehensive health impact assessment

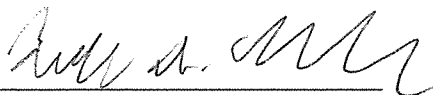
² The emphasized language could be added, at the discretion of the Committee, to limit CHIAs to interstate pipeline infrastructure and as otherwise indicated; otherwise, the requirement would be an across the board state requirement for all such applications.

(CHIA) must be part of the application. The CHIA shall include at least the following phases, and may involve more at the discretion of the Committee, all of which shall be the subject of scheduling and order(s) of the Committee, after public notice and with a public comment period:

- a. **Screening Process**– To identify the policy/regulatory requirements to be addressed by the CHIA and agency decision-makers.
- b. **Scoping** – To develop the framework for the CHIA, identifying the important possible health effects, affected state populations and available evidence to be considered by the CHIA. Minimally, this will include the following steps/tools:
 - Literature research and gathering of opinions from medical and public health experts, scientists, and engineers, as well as economists and sociologists
 - Identifying stakeholders and their information needs
 - Identifying and prioritizing stressors which might lead to health impacts
 - Identifying the boundaries of the potential impact
 - Use the above information to identify methods and tools for data collection
- c. **Assessing risks and benefits** – To analyze baseline conditions and predict potential effects.
- d. **Developing recommendations** – To develop human health-based recommendations and a feasible plan for implementing them.
- e. **Reporting** – To produce the initial, any interim and final text versions of the CHIA to decision-makers, affected populations, other stakeholders and the public.
- f. **Monitoring and evaluating** – To identify health or health risk factors to be monitored, measures to be implemented in mitigation, potential remedial legislation or rules, other potential concerns to be researched and/or addressed, and to evaluate the effectiveness of the measures to be implemented and the value of the CHIA to the process as a whole.”

Thank you for your time and courtesy in this matter.

Very truly yours,

By: 
Richard M. Husband, Esquire
Tel. No. (603)883-1218

Accompany documents

cc: Governor Margaret Wood Hassan

EXHIBIT "A"



STATE OF NEW HAMPSHIRE
OFFICE OF THE GOVERNOR

MARGARET WOOD HASSAN
Governor

February 10, 2016

Norman C. Bay
Chairman, Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

RE: Docket Number CP16-21

Dear Chairman Bay:

I write to request that the Federal Energy Regulatory Commission (FERC) consider requiring a health impact assessment as part of the review of the Northeast Energy Direct (NED) Project.

It goes without saying that the health of our children and families is critically important and we have long fought to create a healthier environment for all of our citizens. While the Environmental Impact Statement (EIS) will assess the potential impact of the project on water resources and air quality, among other issues, my understanding is that the EIS process may not fully capture health impacts.

An independent and comprehensive health impact assessment would allow for a thorough review of the project and a complete understanding of any potential negative health effects that may be caused by the construction and operation of the NED pipeline and could provide important baseline information upon which to assess potential future health impacts.

Protecting the health of our citizens is one of the most important roles of any local, state or federal government entity. A health impact assessment would help to ensure that we are fulfilling our obligation to our citizens to ensure that they have a healthy environment to live, work, and raise their families.

Thank you for your consideration of this request.

With every good wish,

Margaret Wood Hassan
Governor

EXHIBIT "B"

Ad Hoc Working Group Behind:

**“The Role of Comprehensive Health Impact Assessment in Evaluating Infrastructure for
Natural Gas Transport in New York State:**

A White Paper prepared by an *ad hoc* working group for discussion purposes”

Dr. Sheila Bushkin-Bedient

A physician who specializes in public health and preventive medicine, with a particular focus on environmental health. She is a cofounder of Concerned Health Professionals of New York. She has been a member of the Medical Society of the State of New York for 17 years, and is the former Vice-chair of the Committee for Preventive Medicine and Family Health. She is a member of the Institute for Health and the Environment at SUNY Albany. Her specific areas of interest involve environmental health issues, chronic diseases, and health concerns of vulnerable populations. She has a particular interest in the continuing education of physicians, as well as public health education and advocacy.

Dr Larysa Dyrszka

A graduate of Washington University School of Medicine in St. Louis. Following residency and board certification in pediatrics, Dr. Dyrszka practiced general pediatrics and held the position of Director of Pediatrics at Holy Name Hospital in Teaneck, NJ. Her recent work has been focused on children’s rights with the Conference of NGOs at the United Nations Committee on Children’s Rights. She has been a SUNY (State University of New York) Sullivan Community College Board of Trustees Member since 2009, appointed by Governor Paterson. Dr. Dyrszka is an advocate for health on the issue of natural gas exploration and production. She

is a founding member of Sullivan Area Citizens for Responsible Energy Development, vice-chair of the CME curriculum committee for Physicians, Scientists and Engineers for Healthy Energy and on the board of Physicians for Social Responsibility – New York. Together with fellow NY medical colleagues, she founded Concerned Health Professionals of New York.

Ansje Miller

The Eastern States Director for the Center for Environmental Health. In that role, she represents CEH with elected officials and others in New York and Washington. Ms. Miller has led a number of successful legislative and regulatory campaigns that removed the use of toxic chemicals like lead and cadmium from consumer products. Her organizing efforts, research reports, and popular articles have also led to the creation of numerous policies on global warming including California's AB32. Ansje currently serves on the board of the Reproductive Health Technologies Project (RHTP). Prior to her work at CEH, from 2001 to 2006, Ansje founded and directed the Environmental Justice and Climate Change Initiative, a coalition that brought together the nation's leading environmental justice, faith-based, and policy organizations to advocate socially just policies on climate change.

Dr. Kathy Nolan

A pediatrician and bioethicist, with training in epidemiology and research design. She serves as Senior Research Director for Catskill Mountain keeper, where her work has focused on articulating the health impacts of high-volume horizontal fracturing. She is member of the Steering Committee of the New York chapter of Physicians for Social Responsibility, a co-founder of Concerned Health Professionals of New York and co-author of CHPNY's Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of High Volume Horizontal Hydro fracturing.

Charles E Sullivan, Jr., Esquire

An attorney who served 27 years in the New York State Department of Environmental Conservation, nine years as its Director of Environmental Enforcement and the last two years as Special Counsel to the General Counsel. His practice mainly focused on solid waste regulation and enforcement and on hazardous substance remediation.

Ellen Webb

Energy Program Associate in the Center for Environmental Health's New York office for initiatives relating to energy and environmental health. She is currently assisting with the development of a research report evaluating various energy sources based on a comparative assessment of their impact on the environment and human health. Ellen has over a decade of experience working at the intersection of health, science, and policy and has experience working in the private, government and non-profit sectors. Prior to joining CEH, Ellen worked on a range of environmental health initiatives including a study of toxic exposures in hospital environments. She worked with a variety of hospital governance structures in NYC coordinating planning efforts across private, federal and public hospitals for the purpose of improving New York City Hospitals' ability to respond to bio-terrorist attacks as well as other public health emergencies. Her past work includes the development of disaster preparedness guidance documents for hospitals to meet the special needs of New York City's children and improve radiation disaster preparedness. Ellen has her B.A. in Health Sciences from Hampshire College and a M.P.H. in Health Policy & Management from Columbia University.

The Role of Comprehensive Health Impact Assessment in Evaluating Infrastructure for Natural Gas Transport in New York State:
A White Paper prepared by an *ad hoc* working group for discussion purposes
(date of this document: 20 February 2016)

Executive Summary

This white paper provides an overview of four critical issues regarding the role of comprehensive health impact assessment (CHIA) in NYSDEC review of applications for permits and certificates concerning natural gas transport infrastructure proposals. Section I outlines the essential features of CHIA and the value it adds to the review process. Section II documents the increasing need for CHIA given recent developments in the installation, operation, monitoring, and researching of natural gas transportation infrastructure. Section III covers the legal foundation for incorporating CHIA into NYSDEC review procedures. Finally, Section IV proposes particular approaches to CHIA at various points in the State application and review process and in the federal environmental impact assessment process.

I. What is a CHIA

A. Purpose

A comprehensive health impact assessment (“CHIA”) is an in-depth and systematic approach to health impact assessment that uses “an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program or project on the health of a population and the distribution of those effects within the population.”¹ A CHIA provides recommendations on minimizing, monitoring, and managing those effects.

CHIAs inform decisionmaking by identifying and prospectively evaluating potential effects on human health of a development proposal and its alternatives, aiming specifically at predicting how development induces unintended changes in health determinants and resulting changes in health outcomes. After considering multiple factors, a CHIA informs decisionmaking about whether to proceed with a proposed activity and if so, offers recommendations to address health-related gaps in data, to minimize risks and maximize benefits, and to establish a monitoring framework. A CHIA can be performed at many different levels of policymaking and regulation.

Intimately related to environmental impacts, the objective of a CHIA can, and should, be incorporated into an environmental impact statement (“EIS”) but very often, is not. As a result, the typical EIS:

- Does not consider the human health impacts of the project; and when it does, the analysis is narrow
- Does not encompass human health in the “description of the affected environment.” As a result, there are no baseline rates of potentially impacted health problems, no identification of drivers of those problems, no “consequences of the alternatives” in terms of human health -- direct, indirect, or cumulative health risks are not systematically identified or analyzed
- Does not review pertinent medical research and public health studies
- Rarely involves health experts and officials

¹ North American HIA Practice Standards Working Group, “Minimum Elements and Practice Standards for Health Impact Assessment (Version 3, September 2014),” found at <http://hiasociety.org/wp-content/uploads/2013/11/HIA-Practice-Standards-September-2014.pdf>.

- Rarely proposes the “no action” alternative or mitigation measures to protect and promote health

Further, the typical regulatory agency approach estimates the total short-term and long-term emissions directly sent into air or water by the project under consideration. Estimated total emissions are then compared with Federal or State standards for “acceptable” emissions.² If the estimated levels fall below critical thresholds, the project is assessed as having a non-significant health impact. This approach is inadequate. For example, the following are but three examples of impacts that the typical approach presently does not include:

- Emission spikes. Regulatory agencies measure emissions in terms of averages taken over numerous short (for example, one hour or less) or long-term intervals (for example one or more days). Recent studies have found that these averages do not reveal the occurrence of very high levels of “peak” emissions that may occur at irregular intervals. These peaks may have serious adverse health impacts that are not captured by averaging over longer periods of time. A comprehensive assessment performed according to public health professional standards would capture information on peak emissions and their consequent health implications.
- Dynamic evolution of emissions. Regulatory agencies take a very local and static view of toxic emissions, assessing them in isolation from each other and only at the time and place immediately adjacent to their source. Many if not most standards are based on single chemical emission, while under most circumstances it is a mixture of different chemicals that are emitted. In addition, any single emission can disperse widely, evolve, and combine with other emissions and atmospheric conditions and become reabsorbed into distant water and soil. Only a comprehensive health assessment can properly evaluate the full range of emission impacts.
- Downstream and upstream impacts. Regulatory agencies restrict their assessment of impacts to the operations of the project in question. However, pipeline impacts extend far beyond pipeline operations. Pipelines are a “midstream” structure, placed between the start-point of gas well production sites and the endpoint of commercial or residential consumption. Adding a pipeline has the impact of expanding both production and consumption; and many studies have reported that the endpoint use of pipeline-provided gas in residential stoves has adverse impacts on respiratory function. Only the CHIA component of an environmental impact assessment would, correctly, view this as a pipeline impact.

The above examples are not exhaustive. The issue of vulnerable sub-populations (such as people with pre-existing asthmatic conditions) is not routinely addressed by regulatory agencies, but is a key CHIA element.

As an integral component of an EIS, the CHIA must be completed before any final decisions are made by the regulators, and, must inform such decisions. Unlike the other components of an EIS, which focus on estimating and evaluating the increase in environmental stressors (*e.g.*, air, water and soil contamination; population movement; *etc.*) and then on articulating means and methods to eliminate adverse environmental impacts to the maximum extent practicable, the CHIA component is specifically designed to consider and evaluate potential *human health* impacts by identifying the potential pathways

² In fact, the Department’s rationale in rejecting recommendations in the Algonquin Incremental Market Project to conduct an independent air emissions baseline assessment and health impact study consistent with the resolutions adopted by many municipalities within the New York portion of the AIM Project reflects precisely this approach: “Neither ... is required in order for the NYSDEC to issue the Title V air permit modifications because the AIM Project complies with all applicable federal and state regulations, which have been established to protect public health and safety.” “New York State Department of Environmental Conservation Response to Public Comments: Algonquin Incremental Market Project, May 2015,” which may be found at: http://www.spectraenergy.com/content/documents/Projects/AIM/NYSDEC_Response_Public_Comments_AIM%20Project_%20May%202015_DEC%20website_7625736_1-c.PDF.

for such stressors to harm human health, quantifying the cumulative risks posed by such stressors, and recommending necessary mitigation. The goal of the CHIA component of an EIS, then, is to maximize preservation of the health of individuals and to minimize negative health impacts. The CHIA component therefore focuses specifically on health outcomes linked to potential exposures, including respiratory, cardiovascular, oncologic, dermatologic, reproductive, developmental, neurological, psychiatric, substance abuse, emerging infectious disease and injury/motor vehicle related impacts, with a special emphasis on vulnerable and general populations in the community. The CHIA component gives special attention to vulnerable populations, such as subpopulations of low socioeconomic status, racial and ethnic minorities, infants and youth, pregnant women, the elderly, the infirm, and industrial workers, because such populations must be protected from levels of exposure that might be judged “on average” to be of insignificant adverse impact. The CHIA component is also well-designed to evaluate both cumulative impacts and site-specific factors (such as local geography and meteorologic conditions) that may predominate in determining whether human health will be adversely impacted by an action.

B. The Steps in the CHIA Process³

The first two steps determine the tools to be used in the following four.

1. Screening –determines what policy/regulatory requirements would the CHIA inform. Identify lead(s) and partners
2. Scoping – develops the framework for the CHIA component; identifies the important possible health effects, affected populations, and available evidence. Identifies budget. Includes the following steps/tools:
 - Literature search and gathering of opinions from medical and public health experts, scientists, and engineers, as well as economists and sociologists
 - Identify stakeholders and their information needs
 - Identify and prioritize stressors which might lead to health impacts
 - Identify the boundaries of the potential impact
 - Specify budget
 - Use the above information to identify methods and tools for data collection
3. Assessing risks and benefits – analyzes baseline conditions and predicts potential effects
4. Developing recommendations – develops human health-based recommendations and a feasible plan for implementing them
5. Reporting – produces the text to be included in the DEIS and FEIS; disseminates the DEIS and FEIS containing, respectively, the interim and final versions of that text to decisionmakers, the public, and other stakeholders
6. Monitoring and evaluating – determines the extent to which inclusion of CHIA in the EIS added value to it, identifies the obstacles to research, and monitors outcomes of implementing decision

II. The need to include CHIAs into environmental impact assessments of the natural gas transport infrastructure in New York and additions thereto is increasingly significant

Incorporating a CHIA into an environmental assessment of a proposed natural gas transport infrastructure project or a proposed policy relating to natural gas transport infrastructure is essential since the CHIA component informs decisionmaking by, among other things, identifying potential risks and benefits of the proposal and making recommendations to minimize risks, maximize benefits, address data gaps, and establish a monitoring framework.

³ Derived from Figure S-1 (p. 7) in National Research Council (2011), “Improving Health in the United States: The Role of Health Impact Assessment by Committee on Health Impact Assessment”, found at http://www.nap.edu/download.php?record_id=13229.

A. Increased understanding of releases and their human health effects

There are over 91,000 miles of natural gas gathering, distribution, and transportation pipelines in New York State,⁴ with about 40 compressor stations along the more than 4,500 miles of interstate natural gas mainline pipelines alone.⁵ There are pending before the Department of Environmental Conservation applications for certificates and other approvals for several additional mainline pipeline infrastructure projects, each with a number of new, or enlarged, compressor stations.

Setting aside the known impacts on the natural environment of anthropogenic releases of methane, the primary component of the mix of fuel gases commonly known as “natural gas”⁶ – which alone should give cause to question the desirability of expanding natural gas transport infrastructure⁷ -- gases and condensate⁸ in natural gas transport infrastructure have known human health effects. Recent studies show that those releases occur in quantities greater than had been previously estimated and in patterns that pose risk to human health. The need for incorporation of CHIA into environmental impact assessments of natural gas infrastructure projects thus becomes that much more important.

1. Releases

Recent research documents the prevalence of leaks in each component of the natural gas extraction, processing, and transport infrastructure system. As but a few examples:

- According to USEPA, 92.1 percent of methane emissions in the United States natural gas industry come from fugitive emissions (62.1 percent of the total) and vented emissions (30 percent of the total),⁹ with total United States natural gas industry methane emissions accounting for 19 to 21 percent of anthropogenic methane emissions.¹⁰ Additionally, “In the largest, most comprehensive study ever conducted on methane emissions from natural gas gathering facilities and processing plants, researchers led by Colorado State University found that 0.47 percent of the methane produced domestically is lost during gathering and processing operations. According to the study,

⁴ Click on: <http://www.phmsa.dot.gov/pipeline/library/data-stats/pipelinemileagefacilities>; then click on link to “2010+ Pipeline Miles and Facilities,” then click on “Continue to PDM Reports.” The next webpage has pipeline mileage statistics available by State. Use “State Name” dropdown box to get New York State data. The data source is the Pipeline and Hazardous Materials Safety Administration.

⁵ <http://www.youareherenymap.org/>.

⁶ “Natural gas is composed primarily of methane, but may also contain ethane, propane and heavier hydrocarbons. Small quantities of nitrogen, oxygen, carbon dioxide, sulfur compounds, and water may also be found in natural gas.” http://www.beg.utexas.edu/energyecon/lng/LNG_introduction_07.php.

⁷ USEPA considers methane to be a major greenhouse gas: “Pound for pound, the comparative impact of CH₄ on climate change is more than 25 times greater than CO₂ over a 100-year period.” <http://www3.epa.gov/climatechange/ghgemissions/gases/ch4.html>. To address the issue of reducing anthropogenic releases of methane into the atmosphere, that agency recently issued a series of regulations and requests for information on emissions occurring at various stages of natural gas extraction, processing, and transportation. See <http://www3.epa.gov/airquality/oilandgas/actions.html>.

⁸ In the context of this White Paper, “condensate” means liquids -- hydrocarbon liquids and water -- that condensed out of the natural gas stream and particulate matter formed during natural gas contact with the materials that coat the inside of the natural gas pipeline.

⁹ USEPA, “Estimate of Methane Emissions from the U.S. Natural Gas Industry,” Table 2, posted September 15, 2015 and found at <http://www3.epa.gov/ttn/chief/ap42/ch14/related/methane.pdf>.

¹⁰ *Ibid.*, at “5.0: Conclusions.” According to USEPA, methane emissions from oil extraction activities and from natural gas extraction, transportation, and distribution activities account for nearly 30 percent of total United States anthropogenic methane emission sources. USEPA news release dated August 18, 2015, “EPA Proposes New Commonsense Measures to Cut Methane Emissions from the Oil and Gas Sector/Proposal Cuts GHG Emissions, Reduces Smog-Forming Air Pollution and Provides Certainty for Industry,” found at <http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceec8525735900400c27/e5f2425e2e668a2b85257ea5005176fa!opendocument>.

methane emissions from gathering systems are equivalent to 30 percent of overall methane emissions in the current U.S. greenhouse gas inventory. The majority of these methane emissions were attributed to normal operations of gathering facilities.”¹¹

- “A Colorado State University-led research team ... completed the most comprehensive field study to date of the amount of methane being emitted at the nation’s natural gas transmission and storage infrastructure. [Based on 2012 data,] [r]esearchers detected methane emissions at compressor stations that were both operating and idle. Estimates based on on-site measurements indicate about 30 percent of aggregate emissions were from facilities where all compressors were idle. ... Without the two superemitters, average methane emissions recorded during the study were higher than the Greenhouse Gas Reporting program, but comparable to or lower than the Environmental Protection Agency’s Greenhouse Gas Inventory estimate. When the superemitters are included, then the study-average emission factors could exceed both EPA estimates.”¹² A follow-up analysis of the data “found that the total amount of methane emitted into the atmosphere from the transmission and storage sector is not statistically different from the emissions reported in the Environmental Protection Agency’s 2012 Greenhouse Gas Inventory¹³ for the sector[, which] ... estimated emissions between 1,680 to 2,690 Gg/yr (mean of 2,071 Gg/yr). The study estimates that total methane emissions from the transmission and storage sector resulted in the loss of 0.28% to 0.45% (mean of 0.35%) of the methane transported in 2012.”¹⁴ This new information, combined with other data acquired from other studies, led USEPA last week to announce its re-evaluation of its inventory.¹⁵
- A Harvard University study of natural gas leaks from the Boston area’s natural gas infrastructure published in January 2015 showed that natural gas is leaking from that infrastructure at rates two to three times higher than previous government estimates, with an overall leak rate of 2.1 percent to 3.3 percent.¹⁶

Additionally, at present, planned releases of large volumes of transported fuel gases into the atmosphere (commonly known as “blowdown events”) are an integral component of routine pipeline infrastructure operations.¹⁷

¹¹ <http://source.colostate.edu/researchers-measure-methane-lost-in-natural-gas-operations/>. The study itself, A. Marchese et al., “Methane Emissions from United States Natural Gas Gathering and Processing,” *Environ. Sci. Technol.* 2015, 49, 10718–10727, may be found at <http://pubs.acs.org/doi/pdf/10.1021/acs.est.5b02275>.

¹² <http://source.colostate.edu/csu-study-measures-methane-emissions-natural-gas-transmission-storage-sites/>. The report, R. Subramanian et al., “Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol,” *Environ. Sci. Technol.* 2015, 49, 3252–3261, may be found at <http://pubs.acs.org/doi/pdfplus/10.1021/es5060258>.

¹³ USEPA’s Greenhouse Gas Inventory is one of the federal agency’s two programs that track methane from the natural gas infrastructure system.

¹⁴ <http://source.colostate.edu/results-of-second-methane-emissions-study-published/>. The study, D. Zimmerle et al., “Methane Emissions from the Natural Gas Transmission and Storage System in the United States,” *Environ. Sci. Technol.* 2015, 49, 9374–9383, may be found at <http://pubs.acs.org/doi/pdf/10.1021/acs.est.5b01669>.

¹⁵ USEPA, “Inventory of U.S. Greenhouse Gas Emissions and Sinks: Revisions under Consideration for Natural Gas Transmission and Storage Emissions January 2016),” posted January 20, 2016, and found at http://www3.epa.gov/climatechange/ghgemissions/usinventoryreport/DRAFT%20Proposed%20Revisions%20to%20ONG%20Transmission%20Storage%20Segment%20Emissions_2016-01-20.pdf.

¹⁶ K. McKain et al., “Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts,” *Proceedings of the National Academy of Sciences*, 112: 1941-1946 (February 17, 2015), which may be found at <http://www.pnas.org/content/112/7/1941.full.pdf>.

¹⁷ See Argonne National Laboratory, “Natural Gas Pipeline Technology Overview,” (2007), p.45. This report may be found at http://corridoreis.anl.gov/documents/docs/technical/apt_61034_evs_tm_08_5.pdf. See also “Infrastructure” in Concerned Health Professional of New York, “Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction), Third Edition

The above, and other, studies and analyses led USEPA last year to propose regulations that tighten requirements intended to reduce methane emissions from the natural gas transport infrastructure system.¹⁸

These releases, occurring through spills, leaks, and intended releases, pose threats to the environment and human health ranging from impacts on forests and wetlands to exposure to radiation, gas, and hazardous condensate.

The push to build new natural gas transport infrastructure appears to be having a materially adverse impact on pipeline safety:

- According to a 2015 Pipeline Safety Trust analysis of federal data, new pipelines are failing at a rate on par with gas transmission lines installed before the 1940s. Carl Weimer, director of the Pipeline Safety Trust, told attendees at a National Association of Pipeline Safety Representatives annual meeting in Tempe, Arizona, “The new pipelines are failing even worse than the oldest pipelines.” The Trust looked at the annual average number of incidents per 10,000 miles of onshore transmission lines over 2005-2013 based on when the pipelines were installed, as reported to PHMSA and found a “bathtub curve” with high points on the ends and low points in the middle, indicating that the oldest pipes and the newest pipes had the highest rates of incidents.
- Robert Miller, chairman of the National Association of Pipeline Safety Representatives said in a September 1, 2015 interview that while more emphasis has been placed on construction inspections, “If it's brand new, if it's all new materials, if everybody was doing their job correctly, why would we have an uptick in ... failures?” Miller, who is also the Arizona Corporation Commission's pipeline safety section supervisor, said, “You can only attribute that, in my personal opinion, to poor construction practices or maybe not enough quality control, quality assurance programs out there to catch these problems before those pipelines go into service.”
- Robert Hall, director of the NTSB's Office of Railroad, Pipeline and Hazardous Materials Investigations, noted in a September 1, 2015 interview that the “bathtub curve phenomenon” is well established among industries working through the struggles of new technology, but he agreed that the rapid construction of pipelines in the United States is likely a contributing factor to “people ... out there possibly taking shortcuts or not being as diligent” as they would be if the pace of construction were less fervent.¹⁹

Pipeline ruptures occur even in newly constructed pipelines. As but one example: a 20 foot by 20 foot rupture occurred in January 2015 in a buried 42 inch pipeline in Missouri that went fully online in

(October 2015)”, found at <http://concernedhealthny.org/wp-content/uploads/2012/11/PSR-CHPNY-Compendium-3.0.pdf>.

¹⁸ USEPA news release dated August 18, 2015, “EPA Proposes New Commonsense Measures to Cut Methane Emissions from the Oil and Gas Sector/Proposal Cuts GHG Emissions, Reduces Smog-Forming Air Pollution and Provides Certainty for Industry,” found at <http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceac8525735900400c27/e5f2425e2e668a2b85257ea5005176fa!opendocument>. See also [Natural Gas STAR Annual Implementation Workshop, Pittsburgh, Pennsylvania, November 18, 2015, “Directed Inspection and Maintenance for Transmission Compressor Station Leak Reduction: Program Focus Supported by Subpart W Data,” found at http://www3.epa.gov/gasstar/documents/workshops/2015_AIW/19mccarthypugh.pdf.

¹⁹ <http://www.napsr.org/SiteAssets/mediainfo/SNL%20Sept%209%202015%20BathTub%20Curve%20Construction%20Practices.pdf>. USEPA’s 2015 rulemaking proposals intended to reduce methane emissions from natural gas infrastructure may have the beneficial consequence of providing an enforceable adjunct in New York State to PHMSA’s pipeline safety program in the form of NYSDEC’s Air Resources program.

November 2009.²⁰ Reductions in staffing at regulatory agencies make oversight and timely correction of deficiencies more difficult.

2. Human health effects

Experience in other states across the country and, in particular, right across the southern border of New York, in Pennsylvania, shows that a decision to allow further expansion of natural gas infrastructure in New York in order to allow transport of natural gas extracted by means of high volume hydraulic fracture technology (“HVHF”) has the potential to result in significant substantive effects on human health, particularly effects that could be avoidable, involuntary, adverse, and irreversible. Numerous members of New York’s medical community have affirmed this conclusion.²¹

Residents living near shale gas operations have reported health issues ranging from dizziness, sinus disorders, bronchitis, and other respiratory symptoms to depression, nausea, fatigue, headaches, anxiety, difficulty concentrating, and cancer. A Colorado School of Public Health study released in March 2012 found that cancer risks were 66 percent higher for residents living less than half a mile from oil and gas wells than for those living farther away, with benzene being the major contributor to the increased risk. While these studies primarily relate to gas extraction activity consequences, some research has included consideration of pipelines and compressor stations.²² Health impacts may occur in these

²⁰ “Pipeline Ruptures Near Pike 43”, The People’s Tribune, February 3, 2015, found at <http://thepeopletribune.com/?author=2>.

²¹ In support of an HIA on HVHF, in October 2011, 250 physicians and medical professionals wrote a letter calling for a comprehensive public health impact assessment on HVHF.

The Medical Society of the State of New York adopted Position Statement 260.904 “Protecting Public Health from Natural Gas Infrastructure” in May, 2015, which states that the Society recognizes the potential impact on human health and environment associated with natural gas infrastructure and supports governmental assessment of the health and environmental risks that are associated with natural gas pipelines. The Position Statement may be found at http://www.mssny.org/MSSNY/About_MSSNY/Position_Statements/HTML-Position_Statements-2.aspx#260000.

In June 2015, the American Medical Association adopted a similar policy (number: H-135.930): “Protecting Public Health from Natural Gas Infrastructure,” found at <https://searchpf.ama-assn.org/SearchML/searchDetails.action?uri=%2FAMADoc%2Fhod.xml-0-297.xml> which states, “Our AMA recognizes the potential impact on human health associated with natural gas infrastructure and supports legislation that would require a comprehensive Health Impact Assessment regarding the health risks that may be associated with natural gas pipelines.”

²² See, e.g.,

- D. Brown *et al.*, “Understanding exposure from natural gas drilling puts current air standards to the test,” *Reviews in Environmental Health* 2014: 29(4):277-92, the abstract for which may be found at <http://www.ncbi.nlm.nih.gov/pubmed/24690938>.
- Southwest Pennsylvania Environmental Health Project, “Summary of Minisink Monitoring Results” found at <http://www.environmentalhealthproject.org/wp-content/uploads/2015/06/Summary-of-Minisink-Results.Public.pdf> (documented episodic spikes in air pollutants emanating from this compressor station, which became operational in 2013, corresponded with waxing and waning self-reported health symptoms among 35 residents in eight families living within a mile of the compressor. Six of 12 children suffered from nosebleeds); and W Gillingham *et al.*, “Toxic Air Emissions During a Compressor Station Blowdown at Hancock New York” (submitted for publication).
- In comments to the Federal Energy Regulatory Commission, New York’s Madison County Health Department reviewed the literature on compressor station emissions and expressed concerns about associated health impacts, including documented correlations between health problems and residential proximity to compressor stations. It also reviewed health outcomes associated with exposures to chemicals known to be released from compressor stations, including volatile organic compounds, carbonyls and aldehydes, aromatics, and particulate matter. In addition, gas from fracking operations transiting through compressor stations carries gaseous radon. The Health Department noted a troubling lack of information on the intensity, frequency, and duration of emission peaks that occur during the blowdowns and large venting

situations even when conventional means of monitoring air quality do not universally document actionable levels of specific toxins. In essence, the human beings who, and farm and domestic animals that, are becoming ill are serving as “bioassays,” revealing the presence of toxins or combinations of toxins that are difficult or impractical to measure in other ways. Thus, instead of measuring environmental contaminants as an indicator of or surrogate for human health impacts, in this setting it may be more accurate and more efficient to measure human health indicators directly as the primary “outcome measures” of possible contaminants. Moreover, it must be kept in mind that (a) leaks occur in the infrastructure used to transport gas extracted from HVHF gas wells and (b) standard procedure for planned and unplanned pipeline evacuation events is simply to release into the air the fuel gas contained in the pipeline.

Further, research has also shown that even minute amounts of endocrine disrupting chemicals commonly used in fossil fuel operations may impact humans, particularly children and the unborn, a concern not currently addressed. Such chemicals include many of the additives used in fracking procedures, as well as many of the volatile aromatic compounds (such as “BTEX”: benzene, toluene, ethylene, and xylene) that travel with methane and other components of natural gas.

Other factors that confirm that a CHIA would add value to the decisionmaking process in New York are the presence of broad stakeholder concerns about the decision’s health effects, the potential for unequally distributed impacts, the potential for the CHIA to recommend and result in timely changes to various proposals, and the likely availability of resources and technical capacity to conduct the CHIA.

B. Precedent for fossil fuel CHIAs

A CHIA covering natural gas transport infrastructure operations should be undertaken in order to assess the risks to human health that the transport infrastructure already poses and the cumulative and site-specific human health risks that additional infrastructure development will be anticipated to bring about. The timing of such an assessment will be discussed later in this paper.

There is established precedent for preparing HIAs to evaluate the impacts of HVHF and other fossil fuel operations. For example:

- In 2007, a health impact assessment was performed for the Bureau of Land Management and Minerals Management Service for oil and gas development proposals on Alaska’s North Slope. This assessment led to new requirements for air quality analysis and monitoring of any oil related contaminants in subsistence foods, along with more worker education. It also

episodes that are a normal part of compressor operations.

https://www.madisoncounty.ny.gov/sites/default/files/publicinformation/madison_county_doh_comments_-_docket_no._cp14-497-000.pdf

- A research team led by David O. Carpenter at University at Albany found high levels of formaldehyde near 14 compressor stations in three states. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4216869/>. In Arkansas, Pennsylvania, and Wyoming, formaldehyde levels near compressor stations exceeded health-based risk levels. Other hazardous air pollutants detected near compressor stations in this study were benzene and hexane.
- Southwest Pennsylvania Environmental Health Project's (2015, February 24) “Summary on compressor stations and health impacts,” found at <http://www.environmentalhealthproject.org/wp-content/uploads/2012/03/Compressor-station-emissions-and-health-impacts-02.24.2015.pdf>, describes impacts that are based upon the researchers' first-hand experience with health impacts in southwest Pennsylvania. It also describes the results of other studies conducted by the Pennsylvania Department of Environmental Protection, by the Texas Commission on Environmental Quality, consultants for Dish, Texas, and by Earthworks, a not-for-profit organization, and by other organizations, identifying the various pollutants emitted during compressor station operations.

identified significant public health impacts not normally examined in the context of an environmental review, including risks from increased traffic accidents, drug trafficking, and infectious diseases.²³

- In 2010, a draft health impact assessment was completed in Garfield County, Colorado for proposed natural gas development in Battlement Mesa.²⁴ The draft assessment concluded “that [the] health of the Battlement Mesa residents will most likely be affected by chemical exposures, accidents or emergencies resulting from industry operations and stress related community changes.” The researchers went on to recommend a set of mitigation measures to reduce the health threats to local residents. The Battlement Mesa assessment clearly demonstrates the feasibility and utility of health impact assessments for evaluating risks to the health of local residents from HVHF and horizontal drilling operations.
- In September 2014, the City of Hermosa Beach, California released its report covering its health impact assessment of the E&B oil well drilling and production project proposed to be undertaken in the city.²⁵ While the assessment concluded that when considered by itself, the project under review is expected not to cause more than nuisance health impacts to the general population, it provided monitoring recommendations for the city to consider, including a community liaison committee to address resident’s active concerns about project activities; a follow-up community health assessment to identify if some groups are disproportionately impacted by project activities; and a quality of life survey to establish baseline conditions in Hermosa Beach, and to monitor health status changes during the project.
- On December 17, 2014, the New York State Department of Health (NYSDOH) released its review of the health impacts of HVHF. This 186-page document served as the foundation for NYDEC’s determination not to issue permits for high volume hydraulic fracturing.²⁶ While NYSDOH did not employ a formal CHIA to reach its conclusions, it “identified environmental problems associated with fracking that could contribute to adverse public health impacts. Among them: air pollution (particulate matter, ozone, diesel exhaust, and volatile organic compounds) that could affect respiratory health; drinking water contamination from underground migration of methane and/or fracking chemicals associated with faulty well construction or seismic activity; drinking water contamination from inadequate water treatment of fracking waste or from surface spills of fracking chemicals or wastewater; earthquakes and the creation of fissures; increased vehicle traffic; increased noise; increased demand for housing and medical care; and public health problems related to climate change impacts from methane and other greenhouse gas emissions into the atmosphere.”²⁷ NYSDOH concluded that “there are significant uncertainties about the kinds

²³ See A. Dannenberg *et al.*, “Use of Health Impact Assessment in the U.S.: 27 Case Studies, 1999–2007,” *American Journal of Preventive Medicine*, 2008;34(3):241–256, which may be found at

www.cdc.gov/healthyplaces/publications/AJPM_HIAcasestudies_March2008.pdf. See also R. Bhatia and A. Wernham, “Integrating Human Health into Environmental Impact Assessment: An Unrealized Opportunity for Environmental Health and Justice,” which may be found at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2516559/#b70-ehp0116-000991>.

²⁴ The draft report may be found at <http://www.garfield-county.com/environmental-health/battlement-mesa-health-impact-assessment-draft2.aspx>

²⁵ The report, entitled, “Health Impact Assessment: E&B Oil Drilling and Production Project,” may be found at: <http://www.slideshare.net/StopHermosaBeachOil/final-health-impact-assessment-2014>

²⁶ New York State Department of Health, “A public health review of high volume hydraulic fracturing for shale gas development, December 17, 2014.” The report may be found at http://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf.

²⁷ Concerned Health Professional of New York, “Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction), Third Edition (October

of adverse health outcomes that may be associated with [HVHF], the likelihood of the occurrence of adverse health outcomes and the effectiveness of some of the mitigation measures in reducing or preventing environmental impacts which could adversely affect public health.”²⁸ The contributions of the NYSDOH’s thorough review of the health and science literature were pivotal in NYSDEC’s determination under SEQRA that HVHF should not proceed in New York State.

III. Incorporating CHIAs into the environmental impact assessment of a natural gas infrastructure project

A. SEQRA, NEPA, and CHIA

1. As lead agent on a state certificate or other approval under the Clean Water Act or Clean Air Act for an interstate natural gas pipeline project, the Department of Environmental Conservation has the responsibility to evaluate the environmental effects of that project on New York’s environment. In carrying out this responsibility, it must consult with all other state agencies that could provide it with information and evaluation needed to ensure that the adverse environmental effects of at least those components of the project that are located in New York are eliminated or, if that is not possible, are minimized to the maximum extent practicable. Since such elimination or minimization necessarily entails, among other things, eliminating or minimizing adverse human health effects that a project may pose,²⁹ the Department must ensure that all human health impacts arising from any interstate natural gas pipeline project over which it has approval jurisdiction are minimized to the maximum extent practicable, if not totally eliminated.

2. In enacting the National Environmental Policy Act of 1969, as amended,³⁰ Congress declared a national policy “which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man.” In order to carry out that policy, the federal government must “use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may ... assure for all Americans safe [and] ... healthful ... surroundings; [and to] attain the widest range of beneficial uses of the environment without ... risk to health or safety.”³¹ The environmental assessment process contained in the Act is a systematic interdisciplinary approach “intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.”³² Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment.

“Environment” in the NEPA context encompasses the human environment, which is interpreted comprehensively “to include the natural and physical environment and the relationship of people with that environment. (See the definition of ‘effects’ (Sec. 1508.8], which defines ‘effects’ to include effects on,

2015)”, found at <http://concernedhealthny.org/wp-content/uploads/2012/11/PSR-CHPNY-Compendium-3.0.pdf>, at page 74.

²⁸ New York State Department of Health, “A public health review of high volume hydraulic fracturing for shale gas development, December 17, 2014.” The report may be found at http://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf.

²⁹ See, for example, *Riverhead Business Improvement District Management Association, Inc. et al. v Stark*, 253 AD2d 752 (Second Dept, 1998) (“To comply with SEQRA, the Town Board was obligated to consider the environmental concerns that were reasonably likely to result from [the proposed action]”); ECL 1-0101.1, 1-0101.3.a, 1-0101.3.c, 8-0101, 8-0105.6; see also 6 NYCRR 617.2(1): “Environment means the physical conditions that will be affected by a proposed action, including ... human health.”

³⁰ Pub. L. 91-190, 42 U.S.C. 4321 *et seq.*

³¹ 42 USC 4331(b).

³² 40 CFR 1500.1(c).

among others, *health, whether direct, indirect, or cumulative*].) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.”³³

3. While the Department’s work with the Department of Health on a health review containing some elements of a CHIA in the context of the Supplemental Generic Environmental Impact Statement covering HVHF operations reflects the Department’s acknowledgment of the above view of its SEQRA obligations, typically there is no information pertaining to, or discussion of, specific potential health impacts or vulnerable subpopulations in the usual SEQRA- or NEPA-mandated EIS that either the Department or federal agencies undertake or require of an applicant. This serious deficiency in the existing process of evaluating the environmental impact of a proposed project results in current environmental assessments covering natural gas transport infrastructure projects containing no references to peer-reviewed literature on health effects near such infrastructure despite there being several determinants of health impacts that should be studied – and would be in the CHIA component of an EIS relating to that infrastructure. Those determinants include:

- Baseline health of population and prevalence of relevant diseases
- Identity and location of vulnerable populations and high-risk groups (*e.g.*, communities with low socioeconomic status, racial and ethnic minorities, women of childbearing age, infants, youth, elderly, and people with pre-existing or latent health conditions) and areas of particular concern (*e.g.*, sites near residences, schools, camps, recreational facilities, nursing homes, hospitals, agricultural regions, areas of sensitive geographical characteristics, such as wetlands and natural wildlife preserves, and sites likely to concentrate contaminants)
- Pathways of exposure: all potential pathways that link the activity to health, direct, indirect and cumulative (*e.g.*, risks of multiple chemical exposures; accident risk, diet/subsistence factors; strain on services; and social changes such as violence and crime)
- Modeling of, for instance, air impacts, local and distant
- Review of scientific information and research on health impacts of compressor stations, metering stations, regulating stations and pigging facilities and other infrastructure associated with transported natural gas, including Colorado research on negative health impacts from HVHF-related air pollution
- Input from local population and county and regional health departments
- Worker health included as part of the community health evaluation
- A literature search and expert opinions from the medical and public health community and from other experts

The CHIA component also provides recommendations for health-based mitigation. For instance, in the case of air impacts, recommendations could include best control practices near particularly vulnerable communities that may drive enhanced mitigation measures, development of site-specific monitoring and adaptive management based on local meteorological conditions and population vulnerability, and/or alternative siting or avoidance of some areas altogether. With respect to water impacts, health-based mitigation could include identification and monitoring of sensitive receptors and addressing unique pathways such as subsistence consumption.

The failure to evaluate and attempt to mitigate potential health impacts associated with natural gas transport infrastructure can result in a number of negative outcomes for the State, including more illness and disability and decreased productivity; increased cost to insurers, business owners and the state

³³ 40 CFR 1508.14.

for health care; social instability; loss of community support; and particularly adverse effects for those who are poor, already ill, underserved or otherwise vulnerable.

B. SEQRA, NEPA, CHIA, and the Natural Gas Act

1. The Department apparently is of the opinion that it lacks SEQRA jurisdiction when reviewing an interstate natural gas transport infrastructure project, citing *National Fuel Gas Supply Corporation v Public Service Commission*, 894 F.2d 571(2nd Cir, 1990) and *In the matter of East End Property Company #1, LLC, et al. v Kessel*, 46 AD3d 817, 851 NYS2d 565 (Second Dept, 2007).³⁴ However, *National Fuel Gas* turned on the court’s determination that PSC lacks jurisdiction to consider interstate pipeline matters. Thus, if PSC lacks jurisdiction to consider a matter, it of course lacks jurisdiction to review the matter under SEQRA. And, the statement to the effect that states lack authority to exercise their environmental review statutes when dealing with interstate natural gas pipeline projects,³⁵ which the Second Department cited in its decision, should now simply best be seen as a generalization since the case predates reference to the environmental review authorities reserved to the states under the Natural Gas Act resulting from the Energy Policy Act of 2005.

The Energy Policy Act of 2005 revised the Natural Gas Act to have it expressly reserve to states their authorities under the Water Pollution Control Act, the Clean Air Act, and the Coastal Zone Management Act.³⁶ The Department is the cognizant State agency for regulation of activities within the State covered by the Water Pollution Control Act and Clean Air Act; the Department of State is the cognizant State agency for the Coastal Zone Management Program. The Department’s authorization to administer the federal Water Pollution Control Act program in lieu of USEPA is based upon ECL 1-0101, 3-0301, and Article 8, among other authorities. Under the analytical approach that the Fourth and DC Circuits respectively used in *AES Sparrows Point LNG, LLC et al. v Smith et al.*, 527 F.3d 120 (4th Cir., 2008) and *Dominion Transmission, Inc. v Robert Summers et al.*, 723 F.3d 238 (DC Cir, 2013), therefore, the Department’s review under the Water Pollution Control Act Section 401 properly encompasses environmental review of the project subject to the Section 401 certification and that environmental review is subject to SEQRA – which encompasses health impact assessments.³⁷

³⁴ See also *Northern Natural Gas Co. v. Iowa Utilities Board*, 377 F.3d 817 (8th Cir. 2004) (preempting Iowa law land restoration rules because the FERC completely occupied the field of environmental issues related to the construction of natural gas facilities); *Hines v. Davidowitz*, 312 U.S. 52, 67 (1941) (a valid federal law will preempt any state law that “stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress”); *Schneidewind v. ANR Pipeline Co.*, 485 U.S. 298 (1988) – all cases decided before enactment in 2005 of 15 USC 717b(d).

³⁵ “Because FERC has authority to consider environmental issues, states may not engage in concurrent site-specific environmental review.” 894 F.2d 571, 579.

³⁶ At 15 USC 717b(d).

³⁷ Department counsel argued at a January 25, 2016 meeting with the authors of this White Paper that notwithstanding the Fourth and DC Circuit opinions – which they admitted not having known about prior to the meeting, principles of federal pre-emption continue to prevent the Department from carrying out its SEQRA responsibilities. (Federal pre-emption applies in three major situations: express pre-emption, field pre-emption, and conflict preemption. Express pre-emption applies when Congress expressly intends to preempt state law; field pre-emption applies when Congress’s intent to preempt all state law in a particular area may be inferred because the scheme of federal regulation is sufficiently comprehensive, viz., where the “federal interest is so dominant that the federal system will be assumed to preclude enforcement of state law on the same subject”; and conflict pre-emption occurs when state law is nullified to the extent that it actually conflicts with federal law, even though Congress has not displaced all state law in a given area when compliance with both federal and state regulations is a “physical impossibility” or when state law hinders “the full purposes and objectives of Congress.” See generally *Hillsborough County v. Automated Medical Laboratories, Inc.*, 471 U.S. 707 (1985).

However, FERC itself acknowledges in a case before it heard a decade ago, that because the Coastal Zone Management Act is a federal requirement, “the CZMA and the NGA [Natural Gas Act] are laws of equal dignity and should be read to complement rather than preempt one another.” [108 F.E.R.C. ¶ 61,155 at PP 8-13]. The same

At least one other state – Washington – already views its authority to independently evaluate the environmental impacts of a natural gas infrastructure project under its state environmental review statute and has declared its position to FERC, essentially using the rationale of the *Dominion Transmission* case to justify its assertion of jurisdiction.³⁸

perspective should equally apply to state authority under the Water Pollution Control Act and under the Clean Air Act.

Further, consider that while federal law governs questions involving the interpretation of a federal statute [see *Kamen v. Kemper Financial Services*, 500 U.S. 90, (1991)], the determination that federal law applies does not inevitably require the application of a uniform federal rule. Applying federal law, courts may either fashion a uniform federal common law rule or adopt state law as the federal rule of decision. See *id.*; *United States v. Kimbell Foods, Inc.*, 440 U.S. 715, (1979). In *Kimbell Foods*, for example, the Supreme Court outlined the analysis that determines whether uniform federal common law or state law should apply. The determination depends on the nature and importance of the government interest at issue and the effect of applying state law. To decide whether a national federal rule is necessary, courts should consider: (1) the need for a nationally uniform law; (2) whether incorporation of state law would frustrate specific objectives of the federal program at issue; and (3) the extent to which application of a federal common law rule would upset commercial expectations that state law would govern. Thus, developing a federal common law rule is the exception rather than the rule. Federal law should coincide with the relevant state law unless state law would undermine the objectives of the federal statutory scheme and there is a distinct need for nationwide legal standards. See *Kimbell Foods*, 440 U.S. at 728, 99 S.Ct. at 1458.

Interestingly, in the Federal Water Pollution Control Act context, by virtue of the language of 33 USC 1342(d)(2), while USEPA may overrule a state water quality certificate issuance, its authority to override a state denial is unclear. Also, while USEPA may withdraw its authorization when confronted with a state not administering its water quality program properly, it must exercise this power “with restraint and reserve it for only extreme situations [and] it is extremely doubtful that the unsatisfactory handling of a single permit would ever warrant EPA revocation of a state’s... authority.” *United States v. Cargill, Inc.*, 508 F. Supp. 734, 740 (D. Del. 1981) (citing *Save the Bay, Inc. v. Administrator of EPA*, 556 F.2d 1282, 1284-87, 1290 [5th Cir. 1977]).

³⁸ See October 6, 2015 letter, Gordon White (Washington Department of Ecology program Manager for Shorelands and Environmental Assistance Program) to Kimberly D Bose (Secretary, Federal Energy Regulatory Commission) regarding “Comments on NEPA Draft EIS for Oregon LNG (Docket No. CP09-6, CP09-7) and Washington Expansion Project (Docket No. CP13-507),” at “Attachment” pages 1 and 2:

“Page 4-573: For clarification purposes, the following three paragraphs should be substituted for that in the DEIS: **4.2.9.5 Coastal Zone Management Act** ‘Approved by the federal government in 1976, Washington’s Coastal Zone Management Program (WCZMP) is the authority that the Washington State Department of Ecology’s Shorelands and Environmental Assistance Program relies on when reviewing a project for federal consistency. As described in section 1.5.1.9, the WCZMP applies to all 15 coastal counties that front salt water, extending three nautical miles from shore on the Pacific Coast. The WEP would be within Washington’s coastal zone for activities in Thurston, Pierce, King, Snohomish, Skagit, and Whatcom Counties.

“To receive a consistency determination with the WCZMP, the WEP must demonstrate compliance with the following state laws and their implementing regulations (WACs):

- SEPA (... Ecology is the SEPA Lead Agency for the WEP);
- Shoreline Management Act (RCW 90.58);
- Water Pollution Control Act (RCW 90.48);
- Washington Clean Air Act (RCW 70.94)

“WA Ecology has requested that Northwest prepare an overview Consistency Analysis Document to summarize how the WEP would comply with enforceable policies within coastal zone counties. This document, in addition to the relevant regulatory documents for CZMA consistency demonstrating compliance with the laws listed above, would be used by Ecology to make a single CZMA determination for the WEP. If the WEP is authorized by FERC, Northwest would need to demonstrate that its project is consistent with the CZMA before FERC would allow any construction activities to begin.”

“Page 1-20, SEPA: Note that Ecology could also opt to complete a Supplemental DEIS should it find the current DEIS lacking in important areas.”

The letter may be found at: <http://columbiariverkeeper.org/wp-content/uploads/2015/10/2015.10.6-Washington-Dept-of-Ecology-Comments-on-DEIS.pdf>

2. The supposed impediments to SEQRA's application to an interstate natural gas transport infrastructure project, though, have no play in FERC's own environmental impact assessment under NEPA. Thus,

- as previously discussed under Section III.A.2, FERC is free to more comprehensively evaluate the human health impacts of a proposed project subject to its jurisdiction; and
- when recommending matters to be addressed during FERC's EIS scoping process relating to an interstate natural gas transport infrastructure project and when commenting on the adequacy of a federal DEIS, the Department and the Departments of Health and of State are free to join the Department in urging FERC to undertake that more in-depth human health impact assessment that inclusion of CHIA concepts into FERC's NEPA process can provide.

IV. Proposal for a CHIA on Natural Gas Transport Infrastructure Development in New York

A. Project Description

The proposed CHIA component of an EIS covering natural gas transport infrastructure in New York State will assess the potential health impacts of that infrastructure and will inform decisionmaking about permitting and development of permit conditions encompassing needed health-based mitigation. (At higher policy levels, a CHIA could inform new legislation or regulations related to energy policy and delivery options, including consideration of the comparative health benefits of most forms of renewable energy, including the positive impact of renewable alternatives on climate stability, with its associated health benefits.) Unlike the non-human health related components of the EIS, the CHIA component will give special attention to how the infrastructure may affect vulnerable populations and to what mitigation is needed to protect such groups. The potential health impacts that should be examined through the systematic approach of a CHIA include, but are not limited to, those potentially resulting from or relating to:

- air pollution
- water contamination
- soil contamination
- exposure to endocrine-disrupting and other chemicals
- waste management
- radiation exposure
- spills, accidents
- road safety
- social concerns such as housing, community character, schools, substance abuse and infectious diseases
- economic issues such as employment, home value, health costs, loss of productivity
- health infrastructure including availability of insurance
- justice concerns such as vulnerable populations and equality
- synergistic and cumulative effects of multiple stressors

The CHIA component will lead to recommendations for health-based mitigation (including the potential denial of permits or imposition of permit limitations), additional or new regulations, education programs, monitoring, and further study and potentially risk assessment(s).

B. Implementing the CHIA in the Department's processes

Washington's "State Environmental Policy Act" closely parallels ECL Article 8 in impact analysis approach and in substantive effect: *cf.* Washington Department of Ecology's Online SEPA Handbook, found at <http://www.ecy.wa.gov/programs/sea/sepa/handbk/hbch03.html> and the Department's "SEQR Handbook," found at http://www.dec.ny.gov/docs/permits_ej_operations_pdf/seqrhandbook.pdf).

1. As discussed under Section III.B.1, the Department has the requisite authority to undertake, and, in the context of implementing SEQRA's obligations, to direct the undertaking, of an assessment of the human health impacts of a natural gas transport infrastructure project.

The Department, as lead agency, can obtain any needed expertise to develop the requirements for a CHIA and to evaluate the adequacy and comprehensiveness of any resulting assessment. The Department of Health should be an important source of expertise.

Two major issues arise when considering how to incorporate CHIA into the environmental review of an interstate natural gas transport infrastructure project: (a) what geographical extent does the CHIA cover and (b) at what stage in the permit application review process is the project?

CHIA needs a baseline condition against which a project's particular incremental and cumulative impacts can be assessed; and the Department needs to determine the area of the State whose information will be used to articulate that condition. For example, should the information be drawn from the State as a whole or only from the area through which the infrastructure is proposed to pass or from some other portion of the State (such as an area that does not have any pipeline infrastructure)? The Department should consult with the Department of Health in making this determination.

Where an applicant is in the project review process drives how CHIA may be addressed. For example,

- Before the Department receives any application, it has the opportunity to develop the baseline condition on its own with assistance from other State agencies, such as the Department of Health, and to issue guidance that incorporates CHIA into the requirements for an acceptable environmental assessment of a project.
- Respecting applications pending before the Department as of the date of this White Paper that have not yet been declared "complete" for processing purposes, the Department could inform the applicant that an acceptable environmental assessment for the project would include a CHIA component fulfilling requirements that the Department provides the applicant, with the CHIA component encompassing a description of the baseline condition and an assessment of the incremental and cumulative human health impacts that the project is anticipated to generate. In consultation with the Department of Health, the Department could also identify the qualifications of those who would undertake the CHIA components of the environmental assessment.
- Respecting applications pending before the Department as of the date of this White Paper that have already been declared "complete" for processing purposes, the Department could inform the applicant of the need for it to supplement the environmental assessment by expanding that assessment to encompass a CHIA. The difference between this situation and the situation described immediately above is, in this case, the need to have the supplementation completed before expiration of the time period set forth in federal law for consideration of the application in question in order to have the CHIA's assessment have any impact on agency decisionmaking on the application.

2. Putting aside the question of state agency authority and responsibility to ensure a proposed project's thorough environmental impact assessment under SEQRA, the Department, the Department of Health, and, when the Coastal Zone is potentially affected (as it is whenever a project proposes to cross the Hudson River south of the federal dam in Troy), the Department of State, all have the opportunity to participate in the FERC scoping process intended to ensure the complete assessment of a project's environmental impacts and in FERC's process seeking public input on the adequacy of the environmental impact assessment contained in a project's DEIS. The State agencies should avail themselves of both opportunities to emphasize to FERC the need to include a CHIA into FERC's EIS process.