UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION
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Docket No. CP98-150-00
Docket No. CP98-151-00

MILLENNIUM PIPELINE COMPANY, L.P.
COLUMBIA GAS TRANSMISSION CORPORATION

AFFIDAVIT TO SUPPLEMENT TOWN'S COMMENTS AND PROTEST TO THE MILLENNIUM PIPELINE

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STATE OF OHIO)
: ss.:
COUNTY OF GEAUGA)

CALVIN KONYA, Ph.D., being duly sworn, states:

1. I am the president of Precision Blasting Services, a company incorporated in 1973 to solve blasting problems for the construction, mining, petroleum and natural gas industries. I have a Ph.D. degree in Mining Engineering from the University of Missouri and over 30 years of experience in explosives and blast design, including trenching operations such as those proposed for the Millennium Pipeline Project (the "Pipeline"). submit this affidavit to supplement the Town Of Cortlandt's Comments And Protest To The ConEd Offset/Taconic Alternative And The Supplemental Environmental Impact Statement For The Millennium Pipeline Project ("Town's Comments").

Introduction

2. Millennium's superficial examination of the geologic and geographic conditions on the Taconic Alternative Route (the "Route"), and its boilerplate proposed Pipeline trenching procedures, are wholly insufficient for the Federal Energy Regulatory Commission ("FERC")--

or any other person--to make a reasoned assessment of the environmental and public health and safety impacts associated with the extensive blasting that will be required for this Route.

3. As discussed below, the undisputed steep, rocky and rugged terrain of the Route, and the close proximity of residences and critical high voltage power lines, strongly suggest that blasting for Pipeline trenching on the ConEd right-of-way may: (1) create blast vibrations or shifting in the ubiquitous bedrock that will damage foundations, septic systems, underground storage tanks and other buried utilities, and destabilize or destroy transmission tower footings; (2) generate high velocity, razor sharp flyrock fragments that can sever power lines and kill people thousands of feet away; (3) open bedrock fractures that may (a) permit natural gas (i.e. methane) from inevitable Pipeline leaks to move into nearby residences where its ignition would have explosive and devastating results, (b) convey explosive-related carbon monoxide from blast areas into homes where it could cause injury or death, and (c) convey water intercepted by the Pipeline trench into previously dry basements; and (4) expose residents to (a) asbestos that is naturally occurring in bedrock, and (b) dioxin or other chemicals that may have been used on the Route and that may adhere to airborne rock dust.

4. While Millennium has agreed in various documents to adhere to certain restrictions and mitigation measures, I find that these concessions are largely misinformed and misleading. The proposed restrictions and measures are based on unrealistic assumptions about the dimensions of the trench profile and required work areas, which have been greatly underestimated. Moreover, while Millennium has agreed to meet certain construction goals, it does not provide any details explaining how those goals can be attained given the Route conditions. Once again, this is because the studies needed to provide such details have not been conducted.

5. In sum, because of the difficult terrain and proximity of homes and power lines on this Route, find that the risks of building and operating the Pipeline here, if identified and properly quantified ahead of time, would very probably lead a reasonable regulator to conclude that this Route is not viable, and to select another, less risky, alternative. However, because of the paucity of study here, in my opinion, FERC cannot evaluate or quantify these risks, and, therefore, its selection of this Route for Pipeline is by definition unreasonable.

Background And Experience

6. In June 2001, the Town of Cortlandt (the "Town") retained me to review the rock excavation, trenching and blasting procedures proposed by Millennium for constructing the Pipeline on the Taconic Alternative Route. My qualifications for undertaking this task include my 30 years of experience in blast design; writing dozens of scholarly articles and books on blasting techniques in myriad geologic and geographic conditions; authoring the Blasting Guide Specifications used by the Federal Highway Administration and the United States Army Corps of Engineers, and devising blasting programs for numerous clients' construction, mining, natural gas and oil well projects. Over the last 30 years, these projects have included many involving blasting near high voltage power lines and residences. In fact, in May 2001, I designed blasts under 600 kv high voltage lines transporting power from a hydroelectric generation plant in Tucurui, Brazil. My complete curriculum vitae is attached as Exhibit "A".

7. In preparing this affidavit, reviewed relevant sections of the Millennium Pipeline Project Draft Environmental Impact Statement (the "DEIS"); Millennium Pipeline Project Supplemental Draft Environmental Impact Statement (the "SDEIS"); Comments of Con Edison Company of New York, Inc. Regarding SDEIS ("ConEd Comments"); Comments of the Public Service Commission of the State of New York on the SDEIS; Preliminary Comments Of The

Village of Croton-On-Hudson, New York On The Millennium Pipeline Project SDEIS; Memorandum of Understanding Between The Public Services Commission Of The State Of New York and Millennium Pipeline Company, L. P. (the "MOU"); Supplemental Memorandum Of Understanding Between The Public Services Commission Of The State Of New York and Millennium Pipeline Company, L. P. (the "SMOU"); Town's Comments; Reply Comments of Millennium Pipeline Company, L. P. Regarding Environmental Issues ("Millennium's Reply"); Millennium's Responses To Data Request Of OEP/DEER/ERC II Dated April 16, 2001 ("Millennium's Responses"); Affidavit of David Macks In Support Of Answers And Supplemental Comments Of The Public Service Commission Of The State Of New York ("Macks Affidavit"); Affidavit of Edward C. Schrom In Support Of Answers And Supplemental Comments Of The Public Service Commission Of The State Of New York ("Schrom Affidavit"); Photographs of the Flagged Proposed Pipeline Route and Its Proximity to Residences; Pipeline Schematic Maps of Pipeline Route, and the Geologic Map Of The State Of New York - Lower Hudson Sheet.

8. Based on my review of the documents, it is my professional opinion that Millennium has improperly or insufficiently addressed many significant issues concerning blasting and its impacts on residences and power lines abutting the Taconic Alternative Route. I will address each of these in turn below.

Failure To Adequately Study Route

9. As an initial matter, Millennium's submissions demonstrate a serious lack of knowledge about the precise nature of the complex geologic and geographic characteristics of the Route. Millennium has not performed even the most basic geotechnical survey work necessary to evaluate the location and type of rock, amount of blasting that will be required, and

the risks that blasting will pose in preparing the Pipeline trench and associated work area. In all my years of experience, I have never seen a Project of this magnitude reach such an advanced stage without this fundamental work.

10. Most glaringly, Millennium has not performed any core drilling to test how much rock of what type and competence is present on the Taconic Alternative Route. None of the documents that I have reviewed makes any mention of core drilling on the right-of-way. This information is essential because, without it, Millennium cannot possibly determine how much rock exists, how much explosive will need to be used to create the trench and work areas, and how the rock underlying the right-of-way will react to blasting--e.g. how and where it will fracture, how and how it will transmit vibration.

1 Millennium has stated in its Responses on this issue that:

> given the complex geology of the area, the precise locations where grading could not be accomplished cannot be determined prior to construction. In these areas, blasting would be required not only to create the work area for construction equipment but also to fracture the rock where the trench would be excavated.

(Millennium's Responses at 11, ¶ h).

12. The above response is not true. Aside from core drilling, there are also other simple inexpensive geophysical methods that are regularly used in the blasting and construction industry to estimate rock type, quantity and quality. These methods include shallow refraction seismic surveys. Such methods should be used now to determine how much rock will have to be removed and how many hillsides will have to be cut away and, thereby, ascertain if the route is feasible. Rock core drilling should be done now near homes and structures to determine the quality of the rock so as to be sure that homes, septic tanks, and underground fuel storage tanks will not be damaged with blasting and construction activities.

13. Millennium has simply chosen not to bother to employ these simple geotechnical studies. Yet, absent the information these tests would provide, FERC cannot rationally complete its environmental review of this project because it cannot legitimately evaluate the amount of blasting required for this Route or the environmental and public safety risks associated with it.

14. The documents that I have reviewed also show that Millennium not surveyed the Taconic Alternative Route. None of the documents that I have reviewed depict the proximity of homes to the Pipeline or its associated work area, much less the proximity of proposed blasting areas to those homes or other structures, such as septic systems, oil tanks or other utility lines. The undated aerial photos depicting the Route are not a survey; almost no structures can be seen on these photos, which are obviously taken during a time of heavy foliage cover. Moreover, these photos, at best, only provide a two-dimensional picture; blasting, however, occurs in three dimensions—all of which are crucial for assessing risks to nearby structures.

15. Even the sparse information Millennium has provided in this regard seems to have been hastily thrown together. For example, one of Millennium's Responses claims that there are only five locations where houses are within 50 feet of the proposed Pipeline trench. (Millennium's Responses at 17, ¶ 2). Yet, in another section of the same Responses, Millennium contends that there are seven houses within 50 feet of the proposed Pipeline trench. (Id. at 75, Table DR .2). Given the amount of blasting that is likely to occur, find it astonishing that Millennium has not thoroughly surveyed to determine with certainty how many residences (or other sensitive structures such as septic systems and oil tanks) are within 50 feet of their proposed Route.

16. In short, Millennium has not performed the elementary tests and surveys that are necessary for it or FERC to evaluate the risks of blasting on this Route, or to design a blasting program to minimize those risks. However, even given the scant information Millennium has made available, it appears to me that massive blasting will be required to construct a Pipeline in this area, and, in my opinion, the risks of damaging homes and power lines are likely to be unacceptably high.

Geology And Geography Of This Route

17. My review of the documents, including the aerial photographs and some more detailed photographs taken by residents adjoining the right-of-way, as well as affidavits submitted by the New York State Public Service Commission ("PSC") and comments by ConEd, all indicate that there are significant surface outcrops of rock along the proposed Route on the right-of-way. In fact, there may be as much as five times more rock in this area than Millennium estimated in its FERC application. The affidavit of David Macks indicates that, 21 miles of blasting not the 4.2 miles indicated by Millennium, is a more realistic number. (Macks Affidavit at ¶ 8).

18. My review of the documents and geologic columns from the New York State Geologic Survey indicates that this rock is an intrusive igneous and is composed of granite and altered granites commonly known as "bedrock."

19. Moreover, the terrain throughout much of this route is very steep and hilly. (Millennium's Responses at 11, ¶ i). This makes blasting even more difficult because the area must first be leveled before the pipeline equipment can work. (Id. at ¶ h; Macks Affidavit at ¶ 7).

20. Given these conditions, in my experience, a great deal of blasting will be needed to prepare the site before excavation or pipe laying can even begin. This is confirmed by the affidavit submitted by PSC. (Macks Affidavit at ¶ 7; ConEd Comments at 10.)

21. Because Millennium has never taken any rock core samples or performed any type of geophysical survey, Millennium has no genuine idea whether construction of this route is practicable given the site constraints: close homes, nearby powerlines and very steep, and rugged terrain. It is easy to draw lines on a map, but the lines mean nothing unless the job can actually be performed as planned.

22. In short, I have great concerns about routing this Pipeline near high voltage lines and residences adjacent to the right-of-way. These concerns encompass risks posed by construction activity and long term safety issues. I will first address concerns have of safety during pipeline construction.

Surface Waves, Vibration, And Rock Shifts During Construction

23. Millennium's submissions show that at least seven homes lie within 50 feet of the centerline for the Pipeline trench. (Millennium's Responses at 75, Table DR 1.2). Even assuming the 15-foot work area that Millennium's "typical cross sections" depict on the outer side of the trench is realistic (which, as discussed below, it is not), this means that blasting to create a work area would occur within 35 feet of homes and their associated utilities (e.g. underground storage tanks and septic systems.) (Id.) Indeed, Millennium's submissions show that blasting for the trench could occur within 30 feet of one home, meaning that work-area blasting could occur within 15 feet. (See Id.) I find these distances to be far too close for blasting under the prevailing bedrock conditions.

a. Damage To Structures And Residential Infrastructure

24. Rock displacement, cracking and severe lateral rock movement can and has occurred much beyond 15, 35 or even 50 feet from blasts. These events occur as a result of vibrations--surface waves--that are transmitted through the rock and the intense gas pressures generated when the explosive detonates. These vibrations are on the order of 500,000 psi. The harder the rock the more energy these waves retain over greater distance. Because of their dense crystalline structure, gneiss and granite are very good conductors of such surface waves, making this route particularly problematic.

25. I have personally witnessed lateral rock movement from blasts using very small charges. In 1998 an explosive company distributor fired a small trench blast about 25 feet away from a massive reinforced concrete bridge on a highway construction project in northern Arkansas. The massive reinforced bridge was cracked, lifted and moved by the gas pressures. A portion of this bridge had to be demolished and replaced. personally saw the immense damage created by this small trench blast.

26. Lateral rock movement and ground vibration has the potential of damaging houses, basements, and underground infrastructure—including oil tanks that may already be weakened from corrosion and septic systems. Even without lateral rock movement, blasting could damage these structures if large mud seams exist in the hard rock, as is certainly possible given the terrain. The high pressures gasses will follow the path of least resistance and travel through the soft seams. This can cause high lateral pressures against a structural foundation, storage tank or septic system pipes, severely damaging or even destroying such infrastructure.

27. As already addressed, Millennium has not performed the geotechnical tests to identify if mud seams exist, nor performed any survey to locate subsurface infrastructure to where and how those structures are situated, and at what distance from the blast area.

b. Damage To Powerline Footings

28. The PSC comments indicate that because the rock on the right of way is so hard and so prevalent, that the footing for the power lines have not been built into the bedrock, but sit on top of it in many places. (Schrom Affidavit at ¶ 3). These footings are apparently constructed of poured concrete in many places. (Id.)

29. The SMOU states that the centerline of the Pipeline must be least 100 feet from the outermost conductor on these power lines. However, as discussed in more detail below, the construction of the Pipeline trench would require blasting for the work area as close as 50 feet from the powerlines—perhaps closer if, as PSC suggests in its June 18, 2001, submission, the Pipeline is to be shifted further onto the right-of-way in some areas. (Comments of the Public Service Commission of the State of New York on the SDEIS at 6).

30. For the same reason discussed above, blasting of the type that will be required to create a trench and level work area here could readily result in high vibration and lateral movement and fracturing beneath the power line footings, particularly if these areas are already under stress from the weight of the power line towers.

31. If this were to occur, there could be a catastrophic structural failure resulting in the loss of one or more conductors, or conceivably, entire towers. I will not repeat here the devastating consequences that this could have on the power supply for New York City, as those issues are very thoroughly covered in ConEd's comments. Suffice it to say that I have personally seen poorly prepared blasting plans result in this type of damage to structures.

Again, Millennium has not provided any analysis of how it would react to such a situation if it were to occur. In my opinion, even if Millennium had a contingency plan, the risks this would pose to half the population of the state of New York in and of itself makes this route unreasonable for Pipeline construction.

Damage From Flyrock During Construction

32. When rock is blasted, it is shattered into pieces that can be ejected from the blast area. This is called "flyrock." The amount of flyrock and its velocity depend on several factors: the type of rock; the blast design; the strength of the blast charge; and suppression devices such as blast mats. Flyrock velocities have been measured at near 1000 feet per second or the velocity of a bullet. In my opinion, the factors in this case indicate that blasting for the Pipeline may result in dangerous flyrock being ejected from blast zones in close proximity to homes, power lines and construction workers.

33. Because of its composition, bedrock fractures into very sharp angular pieces when it is blasted. I have seen bedrock shards from blasting that are sharp enough to be used as a knife. These shards, given enough velocity from a blast, are certainly able to slice through a power cable, even one located several hundred feet from the ground.

34. Flyrock can and has killed people. I have seen flyrock cause very gruesome injuries and fatalities at distances of 2500 feet from blasts, and witnessed flyrock damage to property at distances of as much as 5,000 feet. Flyrock shards would consequently have no problem cutting through a residential window, or a human body, located 50 or even 100 feet from a blast area. There have been accidental fatalities that I have investigated in Kentucky, Alabama, Illinois and other states that resulted from flyrock. I have also witnessed and

investigated numerous less serious injuries, ranging from small cuts to large gashes that have occurred as a result of flyrock.

35. Millennium has proposed to use blasting mats to protect against flyrock damage and injury. Blasting mats alone, however, do not provide protection against flyrock from poorly designed blasts. For example I have witnessed six-thousand pound blasting mats thrown 300 feet at Georgia Power in Northern Georgia by a poorly designed blast.

Bedrock Fractures From Construction Blasting

36. Much of the ConEd right of way appears to consist of gneiss, granite and metamorphosed granite. These are rocks that were formed under extreme temperature and pressure and brittle. Fractures in these rocks can move laterally tens or hundreds of feet from a blast. Natural fractures or planes of weakness such as joints, mud seams can also cause fractures to be directional in formation. Consequently, when bedrock is blasted, fractures form laterally and horizontally from the blast area. These fractures can range from several inches in width, to microscopic sizes.

37. Gases and liquids travel along the path of least resistance. Where a pipeline trench is involved, such as here, the path of least resistance is typically along the trench. However, where the trench has been blasted, such as here, the wall rock of the trench will be severely damaged by the blasting. This damage--rock fractures--can extend many feet into the rock surrounding the trench. If these blasting fractures interconnect with existing natural fractures, a path of least resistance can be formed that can run for hundreds even thousands of feet from the initial blast area.

a. Explosive Consequences Of Gas From Pipeline Leaks Moving In Fractures

38. For this reason, there is a significant, unmitigated safety problem with locating a 24-inch natural gas line within 50 to 100 feet of residences or power line towers. In time, every pipeline develops leaks from a variety of causes. These include rust, galvanic action, ground settlement, earthquakes, poor welds at joints, other later construction activities, etc. The leaks can surface many feet away from the actual point of the break along the path of least resistance as previously discussed. Even the smallest gas leak will cause gas to migrate along the path of least resistance from the Pipeline into fractures in the rock.

39. Bedrock fractures, whether natural or blast induced, can and have caused gas migration from leaking pipelines into structures. Instances of this include personal experience we have had with our own company gas transmission lines where gas has surfaced many feet away from the break.

40. A 5% to 15% mixture of natural gas (i.e. methane) in air is explosive and can be readily ignited with an open flame, an electric current, or even a small spark. An explosion near a high pressure methane line, such as the Pipeline, could easily flatten any nearby home, or destroy any nearby transmission tower.

41. In my opinion, given the above conditions, it would be irresponsible to build the Pipeline in this area where it will subject families to the risk of a hazard which will occur some time in the future, and which cannot be eliminated no matter how much mitigation is proposed because of the proximity of the Pipeline to residential structures.

b. Carbon Monoxide Poisoning From Blast Gasses Migrating In Fractures

42. Carbon monoxide is an odorless and colorless gas. When explosives are used to blast rock, their ignition can cause carbon monoxide emissions. I know of several instances

where people have been poisoned from carbon monoxide from blasting fumes traveling through the rock fractures caused by trench blasting.

43. There are several instances of which am aware where Trench blasting in particular caused carbon monoxide poisoning when blasting fumes traveled through rock fractures in the trench. There were two cases of such carbon monoxide poisoning which occurred from trench blasting in Pennsylvania, and the information concerning these accidents is available from the Pennsylvania Department of Environmental Protection. Recently, there was an additional case of alleged carbon monoxide poisoning near Scranton, Pennsylvania. The carbon monoxide was claimed to have migrated into a structure from a trench blast which occurred 130 feet from the structure. There recently was a fatality in Atlanta, Georgia where carbon monoxide killed a worker. The carbon monoxide which resulted from blasting migrated at least 60 feet through the rock on a pipeline project and caused the fatality.

44. Like methane, carbon monoxide will travel along the path of least resistance. If this path is a bedrock fracture leading to a nearby residence, carbon monoxide will be transported to that structure. Particularly in the instance of an enclosed basement, this could have deadly consequences to a person entering that area, who could be quickly overcome by carbon monoxide fumes.

c. Water Migrating In Fractures

45. Water also flows along the path of least resistance, and could migrate through the types of fractures described above from the trench to basements of homes. Indeed, it is a common practice in quarries and mines to use blast induced fractures to move ground water to other locations in the pits.

46. Millennium has stated that trench barriers and trench breakers which would be installed along the pipeline are designed to reduce water flow along the trench but will not stop water migration in the trench. (SDEIS, Appendix IE at Figure 12). These trench breakers and barriers will only reduce the velocity of the water moving through the trench. The wall rock of the trench is severely damaged by the blasting. This damage can extend many feet into the rock surrounding the trench. The water will flow through these fractures and go around any trench barriers or anything placed into the trench.

47. Ironically, the trench barriers may have the adverse effect of causing water to pool behind the barriers and the increased water pressure may force water into fractures which will cause water flow through fractures into basements of adjacent homes.

48. The breakers and barriers may protect the Pipeline against washouts, but they offer no protection to the adjacent homeowners. To the extent that it indicates otherwise, the section on trench breakers and barriers in Millennium's FERC application is thus misleading and incorrect.

Blasting Related Exposure To Airborne Contaminants

49. Blasting and rock cutting do not only fracture rock. These methods produce clouds of fine micron sized rock particles. This dust is not only caused by pulverized surface rock, but from the blasting forming pulverized bedrock as well For decades, blasting experts have tried to suppress rock dust through various methods: water spraying, chemical spraying, ground saturation, etc. All of these methods have been unsuccessful. Simply put, there is no known way to eliminate this dust.

50. If inhaled, rock dust, especially dust containing silica is itself harmful, but usually not fatal. However, under the circumstances that may exist on this Route, rock dust may pose a very significant health risk.

a. Airborne Dioxin From Herbicides Sprayed By ConEd

51. ConEd has admitted to spraying herbicides containing dioxin along the right-of-way. (Town's Comments at 5). While I am not an expert on herbicides or dioxin, I can state that dioxin adheres to rock and soil, and clouds of rock dust produced by blasting will spread this contaminant for hundreds or thousands of feet. This contaminated dust could readily be inhaled by residents adjacent to the Route, and could contaminate wetlands or other surface water present on the Route. A detailed study must be made of the area to determine if dioxin remains in the earth and how far it has leached into the underlaying rock. find it astonishing that these issues were not addressed in the DEIS or SDEIS. cannot conceive how an agency could evaluate the appropriateness of this Route in comparison to other routes without this essential information.

b. Airborne Asbestos From Granite Blasting

52. Another factor that is not addressed in any other documents that I have reviewed is that the granite and other igneous intrusive rock on the Route may contain asbestos, which can also become airborne in blasting dust. The New York State Geologic Map states that these formations contain rock of the amphibole group and serpentine zones. These minerals commonly contain asbestos.

53. The largest asbestos mines in the United States were located in Vermont, and asbestos occurs naturally in many locations in the northeastern United States. Drill cores must be taken and analyzed by Millennium all along the proposed Route to determine whether

asbestos is present before any reasonable decision can be to about the full environmental and health risks associated with this Route for the Pipeline. This is especially so given the close proximity of residences.

Millennium's Blasting "Mitigation" Measures Are Uninformed And Unrealistic

54. The mitigation measures that Millennium proposes in the DEIS and SDEIS, the MOU and SMOU and various other documents are nothing but guesswork. (SDEIS at 2-8; Millennium's Reply at 11). For instance, Millennium has agreed not to exceed vibration limits and to use a rock trenching machine instead of explosives to perform most of the trenching work. But Millennium does not explain how this can be accomplished in light of the actual Route conditions. This is not surprising because Millennium has not yet obtained the detailed geotechnical information needed to determine if these mitigation measures can be achieved and required to design a program to implement them.

Unrealistic Proposal To Use A Rock Trenching Machine

55. For example, Millennium states in its responses that "a rock trenching machine could be used to excavate portions of the trench adjacent to the ConEd Offset/Taconic Alternatives." (Millennium's Responses at 11, ¶ h). Yet, two paragraphs later Millennium states that this Route is characterized in places by "Solid rock: there are several areas where there is surface evidence that the ditch line will be situated in solid rock. The rock is granite, i.e., schist and gneiss." (Id. at ¶ j).

56. I emphatically state that from 30 years of working with rock trenching machines, they will not even cut some hard limestone, much less hard and abrasive granite. For example, a contractor on a construction project in Dayton, Ohio recently tried to use a trenching machine to cut a ditch in limestone, but had to revert to drilling and blasting because of the problems

encountered. FERC should require Millennium to show examples of jobs where these types of granite were successfully trenched with a trenching machine. I am aware of none.

57. Moreover, even if it could cut granite, Millennium concedes that this rock trenching machine cannot be operated on grades exceeding 5%. (Millennium's Responses at 11, ¶ h). My review of the topographical maps indicates that virtually this entire Route contains grades that exceed 5%. To "grade" these areas in order to create an essentially flat work area for a rock trenching machine would require massive cutting and filling--activities which, ironically, would require even more blasting that already needed to create the trench and work areas.

58. In my experience, whatever construction equipment Millennium selects to build this Pipeline, the terrain on which it operates must be somewhat flat and smooth in order for that equipment to work properly. Millennium acknowledges this in the SDEIS:

> Grading is necessary to Provide a smooth and even surface for safe and efficient operation of construction equipment.

(SDEIS, Appendix IE at 3).

59. There are apparent on the maps I reviewed, numerous areas of rocky, rugged, hilly terrain that are not addressed in Millennium's submittals. To prepare a smooth even surface on these steep hillsides would require the removal of rock and the sloping back of walls (for safety and later erosion control) that result on the sides of these cuts. The disturbed area therefore would be much greater than the proposed work right-of-way depicted in Millenniums documents.

60. Simply stated, a great deal of additional blasting will be needed to prepare the site before blasthole drilling, excavation or pipe laying can be done on this Route.

b. Unrealistic Pipeline Trench Profile

61. In an effort to demonstrate that this Pipeline can be built a sufficient distance from nearby residences, Millennium has provided "typical" right-of-way cross sections that show an approximately 2-foot wide ditch with flat work areas of between 15 and 35 feet on either side. (Millennium's Responses at 67-73). However, on a Route as complex as this, there is no such thing as a "typical" cross section. This is simply a way of saying, "we have not surveyed this Route and have no idea what site specific conditions exist." find this type of "shortcut" to be not only misleading but dangerous given the close proximity of homes and high voltage power lines.

62. Without question, the trench required on this proposed Route will be far wider and deeper than depicted on these "typical" cross sections and that indicated in the SDEIS. (Id., SDEIS at 2-8). Blast holes will need to be drilled about two feet deeper than the intended grade of the Pipeline. The intended grade will also be at least one to two feet deeper than the depth to the bottom of the pipe itself because the rock will not break smoothly and hand work to eliminate high spots in the trench bottom is very expensive. There is also the need to put at least one foot of bedding below the pipe. (SDEIS, Appendix IE at Figure 12).

63. Consequently, if the bottom of this 24-inch pipe is designed to be six feet below the surface, then the blast holes would be at least nine feet deep. This already increases the amount of blasting by 50% over that which would seem to be required by reviewing the "typical" cross sections.

64. To place a 24-inch pipe in a rock trench also requires a design width at the bottom to be at least four feet wide so as to provide working room on either side of the pipe, and to insure that the blasted rock wall roughness does not interfere with Pipeline alignment. This

procedure is shown in Figure 12 of Appendix E of the SDEIS. (SDEIS, Appendix IE at Figure 12). The trench walls will not be vertical unless extremely expensive blasting procedures. which are almost certainly cost prohibitive on a project of this type, would be used. In any event, Millennium has nowhere agreed to use such procedures.

65 For this reason, in my opinion, the trench width at the top of the trench will be eight to ten feet wide or more. The claim that a 35 foot work area right-of-way is all that is needed to do the blasting and to move equipment and blasted rock is thus unrealistic (Millennium's Responses at 73). A much wider right-of-way would be needed, especially in rocky areas and rough terrain.

c. No Rationale For "Safe Blasting" Distances

66. I am alarmed about Millennium's apparent lack of concern for the safety of the nearby homes and citizens. The proposed mitigation measures show no comprehension of blasting safety issues. Aside from the above, another example of this appears in Millennium's Responses. (Millennium's Responses at 11, ¶ h). Furthermore, Millennium states in the SDEIS:

> If Blasting is necessary within 150 feet of residential or commercial buildings/structures or other utilities, Millennium will hire an independent contractor to perform pre- and post-blast structural inspections and, if necessary, seismographic monitoring.

(SDEIS, Appendix IE at 7).

67. I am perplexed as to how Millennium arrived at 150 feet as a "safe distance" from the blast in the above reference. Without defining blasting parameters in blasting specifications the 150 feet is arbitrary. Blasting and vibration specifications must be included with

Millennium's submittal before anyone can evaluate what is a "safe distance" between structures and the proposed blasts.

68. Moreover, general seismographic monitoring is not an option on a project of this type. Once a genuine "safe" blasting distance is established, it is absolutely essential that seismic monitoring be done and numerous monitors be placed to evaluate directional vibration effects. Vibration from blasting can be much higher by a factor of two to three times in one direction verses another. I have personal experience in directional vibration effects and the US Bureau of Mines has published Reports of Investigations on directional vibration effects. Every structure, utility line underground tank and septic tank in the path of the Pipeline should be monitored for directional vibration effects.

69. Finally, despite this well-established risk (described in detail above) of carbon monoxide migration from trench blasting, Millennium makes no mention of poisonous gas monitoring in buildings adjacent to the blasting activities.

70. FERC must require blasting and vibration specifications from Millennium based on a through analysis of all of the conditions mentioned in the preceding paragraphs of this affidavit in order to evaluate what is a genuinely "safe" distance for blasting on any route. All alternative routes must then be compared to determine which , if any, allow for a safe distance to be maintained. Only then can FERC determine how many seismographs are needed and where seismic monitors and pre-blast and post-blast structural surveys are needed, and what types of gas testers are acceptable and where the use of gas testers may be required. Based on my review, FERC does not have any of this information in the record before it, and so cannot make a reasoned judgment about the objective safety of this Route either alone, or in comparison to other alternatives.

Operation Of Pipeline Near High Voltage Lines

71. I am not an expert on electrical mitigation studies. But I firmly agree with the comments made by ConEd and in PSC's early comments that these studies must be performed to determine whether this Pipeline can be safely operated so close to high voltage power lines.

72. am well aware that gas pipelines and high voltage lines peacefully coexist on rights-of-way in Westchester County and elsewhere. However, no one has yet performed the studies needed to make a determination about the risks of co-location on this particular Route. Given all of the constraints discussed above, those studies are essential for comparing this Route with other alternatives, and making a reasoned decision before permitting this Project to move forward. That is my understanding of the purpose of the environmental review process: to identify risks, compare alternatives, and select the one that makes the most sense in the balance. I cannot understand how FERC can reasonably permit this Pipeline on this Route without first having these studies in hand.

Conclusion

73. In sum, the full panoply of risks involved in constructing the Pipeline on this Route have not been evaluated. Instead, FERC has been fed boilerplate with a great deal of misinformation. Millennium's commitment to meet federal standards is meaningless, because there are no federal regulations that directly apply to trench blasting. The federal regulations concern explosive transportation, storage, vibration and airblast levels, but do not tell a contractor how to do a job of this type safely, or if it can be done safely at all on this particular Route. In my opinion, the documents that I have reviewed provide no protection against property damage to nearby residential and ConEd structures, or injury or fatalities to citizens. No blasting or vibration specifications have been developed or submitted. No qualifications or

specifications have been written to define the expertise and experience of a blasting consultant which will be used on this project. Until these specifications are submitted there is no control or information on which any sound judgments can be made as to the potential hazards which will result.

74. Given the information that is available, I find that the potential risks from blasting discussed above dictate that FERC select a route for the Pipeline which is far more distant from power lines, residential and commercial structures and dioxin contaminated earth. FERC must require detailed studies and blasting and vibration specifications to be written, presented and analyzed before it can make a rational decision on the viability of this Route over other alternatives.

Calvin Konya, Ph.D.

Sworn to before me this
2 day of July, 2001.

Notary Public
SALLY A. ADAMS
State of Ohio, Geauga County
My Commission Expires 12-06-2003

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Curriculum Vitae

CALVIN J. KONYA

6990 Summers Road

Montville, Ohio 44064

(Office) 440/474-6700 (Home) 440/474-4247

DEGREES AND CREDENTIALS

Distinguished Scientist 1995	Inducted as life member into National Academy of Science for contributions and innovative research in Explosives Engineering (Hungary).
Doctorate 1989 (Honorary)	From Nehezipari Muszaki University (Hungary) for outstanding worldwide contributions in Explosives Engineering.
Ph.D., 1972	Mining Engineering, University of Missouri at Rolla. Emphasis on permeability of coal, explosives application, shaped charge design, fracture propagation, rock mechanics and geology.
MS, 1970	Engineering Management, University of Missouri at Rolla. Emphasis on finance, marketing, personnel relations, computer applications.
MS, 1968	Mining Engineering, University of Missouri at Rolla. Emphasis on explosives application in mining and construction, rock mechanics and geology.
BS, 1966	Mining Engineering, Missouri School of Mines, University of Missouri at Rolla. Emphasis on rock mechanics and blasting.

LICENSES

Blasters License - State of Pennsylvania
Blasters License - State of Illinois
Private Pilot's License

INDUSTRIAL EXPERIENCE

1973-Present — President, Precision Blasting Services, Inc.; Division of Intercontinental Development Corporation. Offices, United States and Europe.

Blast Design Consulting Services
Designed blasts and solved blasting problems for companies in United States, Canada, Australia, South America, Africa and Europe, including Halco Mining, Vulcan Materials, Waste Management of Ohio, TIC Consulting, Woodville, Lime and Chemical, Blount Brothers, Eszak Magyar Orsag Kobanya Vallallat, Mt. Isa Mines, Geupel Construction, Green Construction, Austin Powder, Hercules, Inc., DuPont, Canadian Forces (Military), U.S. Army Corps of Engineers, and numerous others.(see representative clients list attached for more details)

Blasting consultant for Department of Natural Resources for State of Ohio - Coal Mine Blasting. (1980 - Present.)

Research
Industrial and government-funded research in mining and blasting. Government Research Projects completed - 5 million dollars.

Seminars and Training Programs
Designed and instructed Blaster Training Program for Illinois Laborers Union (ongoing). Designed and instructed Training Program in Blasting for MESA, FHWA, U. S. Army Corps of Engineers, Panama Canal Commission, Bureau of Reclamation, and other government agencies. Designed and instructed over 600 seminars on explosives and blasting for the mining and construction industry in USA, Canada, Mexico, Panama, Peru, South Africa, Romania and Hungary

Explosives - Formulations Research
Research with explosives companies to perfect explosives formulations in U.S.A., Canada and Europe.

Legal
Served as consultant and expert witness in legal cases in U.S.A. and Canada.

1966-1973 — Mining Engineering and Blasting Consultant.

ACADEMIC EXPERIENCE

1987-Present — Adjunct Professor, John Carroll University. Adjunct Professor, Industrial and Systems Engineering, Ohio University. Professor Nehezipari Moszaki University - Hungary.

1985-87 — Professor of Mining Engineering, Ohio State University. Taught courses in Rock Mechanics and Blast Design and Vibration Control. Research in Blast Design and Vibration Control.

1980-85	Professor, Chairman of Mining Engineering, and Director of the Ohio Mining and Mineral Resources Research Institute. Taught courses in Rock Mechanics , Blast Design and Vibration Control. Research in Blast Design and Vibration Control.
1978-80	Associate Professor, Director of the Ohio Mining and Mineral Resources Research Institute, and Mining Engineering Program Coordinator at the Ohio State University. Taught courses in Rock Mechanics and Blast Design and Vibration Control. Research in Blast Design and Vibration Control.
1975-78	Associate Professor of Mining Engineering, College of Mineral and Energy Resources, West Virginia University. Taught courses in Blast Design and Vibration Control. Research in Blast Design and Vibration Control.
1975	Exchange Scientist with US National Academy of Sciences for 6 months in Eastern Europe. Studied blasting and mining methods in Hungary and Poland. Worked with Mining Research Institute and Mining Department at University in Miskolc, Hungary.
1971-75	Assistant Professor Mining Engineering, School of Mines, West Virginia University. Taught courses in Rock Mechanics and Blast Design and Vibration Control. Research in Blast Design and Vibration Control.
1970-71	Senior Research Assistant, Rock Mechanics and Explosive Research Center, University of Missouri at Rolla.
1966-70	Teaching Assistant in Mining Engineering, University of Missouri at Rolla.

REPRESENTITIVE GOVERNMENT CONTRACTS RESEARCH AND CONSULTING

2000	18. Blasting Consultant, Alaska DOT, Agreement No. 36893005, amendment Patrick Kemp, Contracting Officer
1998	17. Blasting Consultant, Alaska DOT, Agreement No. 36893005, Patrick Kemp, Contracting Officer
	16. "Preparation of Blasting Manual for US Army Corps of Engineers, COE Contract No. DACW43-98-D-0508, Gary Hempen, St Louis District
	15. "Rock Blasting Course," FHWA contracts principal investigator. FHWA Contract No. DTFH61-98-P-00430. Stephanie Parker, Contracting officer
	14. "Rock Blasting Course Riyadh," FHWA contracts principal investigator. FHWA Contract No. DTFH61-96 00319. Antonio Neves Torres, Contracting officer

1996	13.	"Rock Blasting Course Riyadh," FHWA contracts principal investigator. FHWA Contract No. DTFH61-96-P-00464. Gilbert Trainer, Contracting officer
1993	12.	"Rock Blasting Course Riyadh, Saudi Arabia," FHWA contracts principal investigator. FHWA Contract No. DTFH61-93-P-00464. Gilbert Trainer, Contracting officer
1990-95	11.	"Rock Blasting Course," FHWA contract principal investigator. FHWA Contract No. DTFH61-90-C-0058.
1986-90	10.	"Rock Blasting Course," FHWA contract principal investigator. FHWA Contract No. DTFH 61-86-C-00033.
1983-87	9.	"Rock Blasting Course," FHWA contract principal investigator. FHWA Contract No. DTFH 61-86-C-00110.
1980-81	8.	"Blasthole Depth and Stemming Height Measuring Systems," USBM Contract J0208022, Principal Investigator.
	7.	"Automated Blasthole Logging And Design," OSM Grant No. G 5115006, Consultant.
	6.	"Automated Blasthole Logging and Design," OCRLA-10, Consultant.
1979-81	5.	"Mined Land Reclamation by Biological Reactivation," OSM Grant No. G 5195037, Principal Investigator.
	4.	"Control of Air Blasts and Excessive Ground Vibrations from Blasting by Use of Efficient Stemming," OSM Grant No. G 5195034, Principle Investigator.
1977-78	3.	"In-situ Coal Liquefaction," USBM Contract No. J0265039, Co-principal Investigator.
1973-74	2.	"Technological Forecast of the Coal Extraction Process," USBM Contract S 0241069, Research Engineer.
1971	1.	"Investigation of the Use of Shaped Explosives Charges for Increasing the Permeability of Coal," USBM Contract No. 60101590, Senior Research Assistant.

RESEARCH DIRECTOR AND CONTRACT ADMINISTRATION

1. Konya, C. J., and Sproul O. J., "Coal Extraction, Benefaction, and Utilization Fellowship Program," DHEW, No. 007803570, 9/20/78-9/19/80.

2. Konya, C. J., "Domestic Mining & Mineral Fuel Conservation Fellowships," DHEW, No. 09332-55-0, 9/1/79-8/31/80.

3. Konya, C. J., and Sproul, O. J., "Mining & Mineral Resources Research Institute (MMRRI)" - OSM, G 1184014, 10/1/78-11/30/79.

4. Konya, C. J., "Mining & Mineral Resources Research Institute," OSM, G 1194016, 10/1/79-9/30/80.

5. Konya, C. J., "Mining & Mineral Resources Research Institute (MMRRI) Research Scholarships and Fellowships," OSM, G 1186014, 10/1/78-9/30/81.

6. Konya, C. J., "Mining & Mineral Resources Research Institute," USBM, G 1104025, 10/1/80-8/31/81.

7. Konya, C. J., "Mining & Mineral Resources Research Institute," USBM, G 1114033, 7/1/81-9/30/82.

8. Konya, C. J., "Scholarship/Fellowship Program for Mining and Mineral Resources Research Institute," USBM, G 1116033, 7/1/81-9/30/83.

9. Konya, C. J., "Mining & Mineral Resources Research Institute," USBM, G 1124139, 7/1/82-6/30/83.

10. Konya, C. J., "Mining & Mineral Resources Research Institute," USBM, G 1134139, 7/1/82-6/30/84.

11. Konya, C. J., "Mining & Mineral Resources Research Institute," USBM, G 1144139, 7/1/84-6/30/85.

OTHER EXPERIENCE

1987-present	Awarded life membership in Society of Explosives Engineers, dba International Society of Explosives Engineers
1974-1987	Founder and Executive Director, Society of Explosives Engineers.
1974-1976	National President, Society of Explosives Engineers.
1977-1980	Chairman, Board of Directors, Society of Explosives Engineers.
1979-1988	Member, Executive Committee, Central Ohio Section of AIME.

OTHER PERTINENT INFORMATION

Languages:	Hungarian, French
Citizenship:	U. S. Citizen
Professional:	Founder, first President and Executive Director of the Society of Explosives Engineers. Blasting Committee; Underground Construction Research Council of AIME-ASCE. Society of Mining Engineers, AIME.

PUBLICATIONS

Technical Papers:

1. Konya, C. J., "Spacing of Explosive Charges," MS Thesis, Department of Mining and Petroleum Engineering, University of Missouri at Rolla, 1968.

2. Ash, R. L., Konya, C. J., and Rollins, R. R., "Enhancement Effects from Simultaneously Fired Explosive Charges," "Transactions, Society of Mining Engineers of AIME, Vol. 244, No. 4, December 1969.

3. Clark, G. B., Rollins, R. R., and Konya, C. J., "Use Of Shaped Charges for Increasing the Permeability of Coal," Proceedings of Conference on the Underground Mining Environment, University of Missouri at Rolla, October 1971.

4. Konya, C. J., "The Use of Shaped Explosive Charges to Investigate Permeability, Penetration, and Fracture Formation in Coal, Dolomite, and Plexiglas," Ph.D. Dissertation, Department of Mining and Petroleum Engineering, University of Missouri at Rolla, 1972.

5. Konya, C. J., and Rieke, H. H., "Dynamic Fracturing Phenomena in Model Materials Resulting from Shaped Charge Jet Penetration," Proceedings of Drilling and Rock Mechanics Conference, Society of Petroleum Engineers of AIME, Austin, January, 1973.

6. Konya, C. J., "The Effects of Joints and Bedding Planes on Rock Blasting," Proceedings of the Second Conference on Drilling and Blasting, International Society of Explosives Specialists, Phoenix, February 1973.

7. Skidmore, D. R., and Konya, C. J., "Liquefaction Study of Several Coals and a Concept for Underground Liquefaction," Preprint, Coal Gasification Symposium (Chemical Abstracts, Vol. 82, No. 75337 E, 1973), American Chemical Society, Division of Fuel Chemistry, Dallas, April 1973.

8. Konya, C. J., "High Speed Photographic Analysis of the Mechanics of Presplit Blasting." Proceedings of Sprengtechnick International, (in German), Linz, Austria, 1973.

9. Konya, C. J., "The Mechanics of Rock Breakage Around a Confined Air-Gapped Explosive Charge," Proceedings of the Industrial Blasting Section of the Scientific Society for Building, Budapest, Hungary, January 1974.

10. Skidmore, D. R., and Konya, C. J., "Ammonium Nitrate: Projections on its Future Availability," Proceedings of the First Conference on Explosives and Blasting Technique, Atlanta, 1974.

11. Skidmore, D. R., and Konya, C. J., "Chemical Communition of Coal," Preprint, Annual Meeting, AIME, Dallas 1974.

12. Konya, C. J., "International Blasting Conference -- Linz." Emphasis on Blasting, Vol. 10, No. 1, 1974.

13. Konya, C. J., "Priming and Boostering Practices," Proceedings of Explosives and Blasting Conference, Lexington, 1974.

14. Rieke, H. H., and Konya, C. J., "Influence of Rock Properties on CO Laser Beam Penetration in Some Sedimentary Rocks," GSA, 1974.

Konya, C. J., "Initiierung Von Groben Tiefboltrlochladungen," Information on Stag for Sprengtechnic 1974 International, WIFI, Linz, Austria, December 1974.

16. Ash, R. L., and Konya, C. J., "Flexible Sprengungeineneve Theorie Uber Felssprengung," Informationstag for Sprengtechnik 1975 International, WIFI, Linz, Austria, December 1975.

17. Konya, C. J., And Foldesi, J., "As Inicialasi Pontok Szamanak Meghatarozasa Ando -- Toltott Robbantolyukak Esten," Epitoanyag, Budapest, Hungary, December 1975.

Konya, C. J., and Foldesi, J., "Priming Techniques Employed at the Tallya Quarry," Proceedings of the Second Conference of Explosives and Blasting Technique, Louisville, February 1976.

Konya, C. J., "Proper Blasting Planning and Techniques," Constructor Magazine, March 1976.

20. Konya, C. J., and Foldesi, J., "A Banyafal Also Reazenek Jovesztesi Problkemai Nagyatmeriju Nyujtott Toltetek Robbantasakor," Banyaszat, Budapest, Hungary, November 1976.

Konya, C. J., and Foldesi, J., "Kobanyaszati Robbantasok Tervezese Ngyatmeroju Nuyjtott Toltetekkel," Epitoanyag, Budapest, Hungary, January 1977.

22. Konya, C. J., "Blasting Procedures at Woodville Lime and Chemical Company," Proceedings of the Third Conference of Explosives and Blasting Technique, Pittsburgh, February 1977.

Konya, C. J., "How to Cope with Blasting Problems in Strip Mining," Coal Mining and Processing, September 1977.

24. Konya, C. J., "Good Blasting Practices Mean Money in the Bank," Rock Products, November 1977.

Konya, C. J., and Davis, G. J., "The Effects of Stemming Consist on Retention in Blastholes," Proceedings of the Fourth Conference on Explosives and Blasting Techniques, Society of Explosives Engineers, February 1978

26. Ash, R. L., and Konya, C. J., "Spacing: The Most Important Problems in Blasting," Proceedings of Fifth Conference on Explosives and Blasting Technique, February 1979.

27. Konya, C. J., "Directional Effects of Small Diameter Primers," Proceeding of Sixth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Tampa, 1980.

28. Konya, C. J., "Presplit Blasting: Theory and Practice," Preprint, AIME, Las Vegas, 1980.

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Otuonye, F. O., Konya, C. J., and Skidmore, D. R., "Effects of Stemming Size Distribution on Explosive Charge Confinement: A Laboratory Study," Paper number 83-181, SME of AIME Annual Meeting, Dallas, Feb. 14-18, 1983.

32. Otuonye, F. O., Skidmore, D. R., and Konya, C. J., "Measurements and Predictions of Borehole Pressure Variations in Model Blasting Systems," Proceedings of the First International Symposium on Rock Fragmentation by Blasting, Lulea, Sweden, August 22-25, 1983.

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34. Lundquist, R. G., and Konya, C. J., "A Comparison of Efficiency of Mechanical and Explosive Communition," Proceedings of 24th U.S. National Symposium on Rock Mechanics, Texas A & M University, 1983.

35. Britton, R. R., Konya, C. J., and Skidmore, D. R., "Primary Mechanics for Breaking Rock with Explosive," Proceedings of 25th Symposium on Rock Mechanics, New York, 1984.

36. Konya, C. J., Britton, R. R., and Lukovic, S., "Removing Some of the Mystery from Presplit Blasting," The Journal of Explosives Engineering, Vol. 2, Number 1, Montville, 1984.

Konya, C. J., and Britton, R. R., "Explosive Selection -- A New Approach," Proceedings of the Eleventh Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Montville, 1985.

38. Haghighi, R. G., and Konya, C. J., "The Effect on Bench Movement with Changing Blasthole Length," Proceedings of the Eleventh Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Montville, Ohio, 1985.

39. Ludquist, R. G., and Konya, C. J., "A Comparison of Costs of Mechanical and Explosive Comminution," Preprint No. 85-112, SME-AIME Annual Meeting, February 1985.

40. Haghighi, R. G., Konya C. J., and Lundquist, R. G., "Finite Element Modeling of Rock Breakage Mechanism," Proceedings of the 26th Symposium on Rock Mechanics, Rapid City, 1985.

Konya, C. J., Barrett, D., and Smith, Jr., E., "Presplitting Granite Using Pyrodex, A Propellant," Proceedings of the Twelfth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Montville, Ohio, 1986.

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43. Haghighi, R. G., and Konya, C. J., "Effects of Geology on Burden Displacement," Proceedings of the Twelfth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Montville, Ohio, 1986.

Bhushan, V., Konya, C. J., "Effect of Detonating Cord Downline on Explosive Energy Release," Proceedings of the Twelfth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Montville, Ohio, 1986.

45. Konya, C. J., Britton, R. R., and Lukovic, S. S., "Charge Decoupling and Its Effect on Energy Release and Transmission for One Dynamite and Water Gel Explosive," Proceedings of the Thirteenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Montville, Ohio 1987.

Konya, C. J., "Controlling Back-Break with Proper Borehole Timing," Proceedings of the Thirteenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Montville, Ohio, 1987.

47. Konya, C. J., "Accurate Blasthole Timing Reduces Blasting Cost," Mine and Quarry, England, April 1987.

48. Konya, C. J., and Lukovic, S. S., "Misfired Blastholes Cost Plenty," Coal Mining, July 1987.

49. Konya, C. J., and Lukovic, S. S., "Some Blasthole Priming Methods Can Double Your Costs," Coal Mining, August 1987.50.

50. Konya, C. J., and Walter, E. J., "Blasthole Timing Controls Vibration, Air Blast and Flyrock," Coal Mining, January 1988.

51. Konya, C. J., and Lukovic, S. S., "Blasting Misfire Can Be Costly," Rock Products, January 1988.

52. Konya, C. J., "Problems with Malfunctioning Blastholes," Society of Mining Engineers, Preprint Number 88-30, January 25-28, 1988.

53. Konya, C. J., "Problems with Malfunctioning Blastholes," Proceedings of the Fourteenth Conference of Explosives and Blasting Technique, Society of Explosives Engineers, Montville, February 1988.

54. Konya, C. J., "Priming Methods Reduce Cost," Rock Products, March 1988.

55. Konya, C. J., and Walter E. J., "Timing Controls Blasting Effects," Rock Products, June 1988.

56. Konya, C. J., "High Precision Cap Accuracy," Proceedings of the Fifteenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, New Orleans, Louisiana, 1989.

57. Myers, T. R., Lundquist, R., and Konya, C. J., "Computer-Aided Design of Ring Blasts," Proceedings of the Sixteenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Orlando, Florida, 1990.

58. Konya, C. J., "Designing Blasts with Uncertainty and Tolerance," Proceedings of the Sixteenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Orlando, Florida, 1990.

Konya, C. J., "Blasting Databases: A Unique Method for Saving and Retrieving Blasting Data," Proceedings of the Seventeenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Orlando, Florida, 1991.

60. Konya, C. J. and Bedrosian, O., "Computers - The Blasters Most Powerful Tool, Journal of Explosives Engineers, Volume 7, Number 6, March/April 1990.

61. Konya, C. J. and Bedrosian, O., "Getting Started with Computers," Journal of Explosives Engineers, Volume 8, Number 1, May/June 1990.

62. Konya, C. J. and Bedrosian, O., "The Operating System," Journal of Explosives Engineers, Volume 8, Number 2, July/August 1990.

63. Konya, C. J. and Bedrosian, O., "Managing Files," Journal of Explosives Engineers, Volume 8, Number 4, November/December 1990.

Konya, C. J. and Bedrosian, O., "Calculating Distance and Azimuth Between the Blast and the Monitor," Journal of Explosives Engineers, Volume 8, Number 6, March/April 1991.

65. Dr. Földesi János - Mészáros László - Dr.h.c. Konya, C. J., "A Bányászati és ipari robbantástechnika számítógé-pes támogatása," Proceedings of microCAD '91 Nemzetközi Számítástechnikai Találkozó, Miskolc, Hungary, 1991.

66. Konya, C. J., Bowles, J. K., "Vibration and Air Blast Levels of Natural Phenomena and Normal Activities Compared to Levels of Blasting," Proceedings of the Eighteenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Orlando, Florida, 1992.

67. Konya, C. J., Foldesi, J., "Bridge Demolition without Disruption of Railroad Traffic: A Case History," Proceedings of the Eighteenth Conference on Explosives and Blasting Technique, Society of Explosives Engineers, Orlando, Florida, 1992.

68. Konya, C. J., Case, Lou, Burchet, Harry, Ross, Paul, "Harlan Diversion Project - Upstream Portal Blasting," Proceedings of the Nineteenth Annual Conference on Explosives and Blasting Technique, Society of Explosives Engineers, San Diego, California, 1993.

69. Dr.h.c. Konya, C. J., "Emulziós Robbanóanyag Használatának Előnyei," Proceedings of Fúrás-Robbantástechnika, Miskolc, Hungary, 1993.

70. Dr. Földesi János - Mészáros László - Dr.h.c. Konya, C. J., "A Bányászati Robbantástechnika Számítógépes Támogatása," Proceedings of Fúrás-Robbantástechnika, Miskolc, Hungary, 1993.

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Konya, C. J., "Trouble Shooting Problem Blasts," Engineering & Mining Journal, January 1996, Vol. 197, No. 1, Page 47.

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81. Konya, C. J., "Drilling Accuracy: The Key to Successful Blasting," Engineering & Mining Journal, March 1996, Vol. 197, No.3, Page 78.

82. Konya, C. J., ""Simple Equipment for Blast Diagnostics," Engineering & Mining Journal, May 1996, Vol. 197, No. 5, Page 63.

83. Konya, C. J., "Problems Associated with Deck Loaded Blastholes," Engineering & Mining Journal, July 1996, Vol. 197, No. 7, Page 73.

84. Konya, C. J., "Comparison of Different Blast Design Methods," Engineering & Mining Journal, September 1996, Vol. 197, No. 9, Page 80-85.

85. Konya, C. J., "New Developments in Blasting Technology and Exlplosives in the United States, Proceedings of Furas-Robbantastechnika, Miskolc, Hungary, 1995.

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92. Konya, C. J., "Old Problems Keep Resurfacing," Engineering & Mining Journal, November 1997, Vol. 198, No. 11, Page 92.

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BOOKS AND REPORTS

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CONSULTING
LIST OF
REPRESENTATIVE CLIENTS

Alaska Dept. of Transportation
Akzo Salt
Alcoa
Amax Coal Company
American Limestone Company
Ashville Contracting Company
Austin Powder Company
Bureau of Reclamation
BHP Diamonds
Canadian Department of Justice
Canadian Powder Company
Clinchfield Railroad
Consolidation Coal Company
Dames and Moore
Dixie Lime and Stone
Dufferin quarry
DuPont of Mexico
Enaex S.A.
Ensign Bickford Company
Florida Rock
Foster Miller Associates
Great Canadia Oil Sands, Ltd.
Green Construction Company
Gulf Explosives
Halco Mining
Haley & Aldrich
Hanson Quarries
Hercules Powder
Illinois Laborers & Contractors
Ingersoll Rand
Kentucky Department of Mines & Minerals
Meridian Aggregate
MESA
Milton Quarry
Monsanto
Morrison Knudsen Company
Nello Teer Company
North Carolina Dept. of Transportation
Occidental Oil Shale, Inc.

Ohio Department of Natural Resources
Ohio Shale Gas
Old Ben Coal Company
Oregon Dept. of Transportation
Panama Canal Commission
Pittsburgh and Midway Coal Company
Reece Albert Incorporated
Rinker Quarries
River Cement
Rock of Ages
Sandia Laboratories
Sloan Construction
Southeastern Metropolitan Coal Company
St. Joe Minerals Corporation
Stone & Webster Engineering
Sunstrand Data Control Incorporated
U S Borax
United States Army Corp. of Engineers
United States Bureau of Mines
United States Forest Services
United States Navy
U S Silica
U.S. Steel
University of Nevada
University of Utah
Vulcan Materials Southern Division
Vulcan Materials Mideast Division
Vulcan Materials Midwest Division
Vulcan Materials Mexico
Waste Management
White Rock Quarries
W.M. Brode Company
Wallace Stone Plant
Western Mining Company
Woodville Lime and Chemical Company

AFFIDAVIT OF SERVICE

STATE OF NEW YORK ,
:ss.
COUNTY OF NEW YORK)

HILARY SEMEL, being duly sworn deposes and says that deponent is not a party to this action, is over 18 years of age and resides at New York, New York.

That on the 2nd day of July, 2001 deponent served the within AFFIDAVIT TO SUPPLEMENT TOWN'S COMMENTS AND PROTEST TO THE MILLENNIUM PIPELINE :

SEE ATTACHED SERVICE LIST

at the address designated by said attorney(s) **VIA ELECTRONIC FILING AND FEDERAL EXPRESS.**

Hilary Semel

Sworn to before me this
2nd day of July, 2001

Notary Public

HELAINE KAMENOFF
Notary Public, State of New York
No. 4713370
Qualified in New York County
Commission Expires Nov. 30, 2002