

Copyright Warning & Restrictions

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted material.

Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be “used for any purpose other than private study, scholarship, or research.” If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of “fair use” that user may be liable for copyright infringement,

This institution reserves the right to refuse to accept a copying order if, in its judgment, fulfillment of the order would involve violation of copyright law.

Please Note: The author retains the copyright while the New Jersey Institute of Technology reserves the right to distribute this thesis or dissertation

Printing note: If you do not wish to print this page, then select “Pages from: first page # to: last page #” on the print dialog screen

The Van Houten library has removed some of the personal information and all signatures from the approval page and biographical sketches of theses and dissertations in order to protect the identity of NJIT graduates and faculty.

ABSTRACT

A HISTORY OF OXYGENATED GASOLINE USE IN NEW JERSEY 1992-1998

**by
Jean Niebuhr Borne**

New Jersey has been required to use oxygenated gasoline from November 1 to March 30 since 1992 in order to reduce carbon monoxide from vehicles. This requirement was part of the Clean Air Act Amendments of 1990. For the past six winters, New Jersey has utilized gasoline with methyl butyl tertiary ether, MTBE, as the oxygenate. In New Jersey, and in many states across the country, health complaints were reported after oxygenated fuel started flowing from gas pumps.

Oxybusters is a grassroots organization dedicated to the removal of oxygenated gasoline off the market. The group has pressured Governor Whitman to take steps for the removal of the gasoline from the marketplace. Carbon monoxide emissions are down and the air is cleaner. Additionally, New Jersey has recently implemented a revamped inspection system which should also assist in ridding the air of carbon monoxide.

**A HISTORY OF OXYGENATED GASOLINE USE
IN NEW JERSEY 1992-1998**

**by
Jean Niebuhr Borne**

**A Thesis
Submitted to the Faculty of
New Jersey Institute of Technology
in Partial Fulfillment of the Requirement for the Degree of
Master of Science in Environmental Policy Studies**

Department of Humanities and Social Sciences

May 1999

APPROVAL PAGE

**A HISTORY OF OXYGENATED GASOLINE USE
IN NEW JERSEY 1992-1998**

Jean Niebuhr Borne

John Opie, Thesis Advisor	Date
Distinguished Professor and Director, Graduate Program in Environmental Policy, NJIT	

Robert Friedman, Committee Member	Date
Programs Administrator, NJIT	

Andrew Goldberg, Committee Member	Date
Director of Energy, EXCO USA Inc., New York, New York	

BIOGRAPHICAL SKETCH

Author: Jean Niebuhr Borne

Degree: Master of Science in Environmental Policy Studies

Date: May 1999

Undergraduate and Graduate Education:

- Master of Science in Interdisciplinary Studies
New Jersey Institute of Technology, Newark, NJ, 1999
- Bachelor of Arts in Environmental Studies
Ramapo College of New Jersey, Mahwah, NJ, 1994

Major: Environmental Policy Studies

This thesis is dedicated to
all who supported me in my efforts to complete my degree.

ACKNOWLEDGEMENT

The author wished to express her sincere gratitude to her advisor, Dr. John Opie, for his guidance and support throughout this research.

Special thanks to Dr. Robert Friedman and Mr. Andrew Goldberg for serving as members of the committee.

TABLE OF CONTENTS

Chapter	Page
1 INTRODUCTION	1
1.1 Air Pollution and the Clean Air Act Amendments of 1990	1
1.2 Carbon Monoxide and Oxygenated Gasoline	2
1.3 Health Concerns Associated with Methyl Tertiary Butyl Ether	2
1.4 The Clean Air Act Amendments of 1990 and its Impact on New Jersey	3
1.5 Factors Which May Contribute to Carbon Monoxide Reductions	5
2 THE ISSUES	7
2.1 What Is Oxygenated Fuel?.....	7
2.2 What Is MTBE?	7
2.3 Health Complaints and Reactions	8
2.4 The Odor	10
2.5 Other Air Quality Impacts from Oxygenated Fuel Use	11
3 WHO IS INVOLVED?	13
3.1 Non-Government Organizations.....	13
3.1.1 Oxybusters	13
3.1.2 American Lung Association and New Jersey Environmental Lobby	15
3.1.3 NJ Chapters of Environmental Organizations	16
3.2 New Jersey State Government.....	18
3.2.1 The New Jersey Department of Environmental Protection and Energy	18
3.2.2 The Whitman Administration	18
3.3 The Role of the Media	19

TABLE OF CONTENTS
(Continued)

Chapter	Page
3.4 Manufacturers of MTBE	22
3.5 Trade Organization.....	24
3.6 New York Mercantile Exchange	24
4 HISTORY OF THE NEW JERSEY STORY	26
4.1 New Jersey Implements the Clean Air Act Amendments	26
4.2 Health Research from a Stamford, Connecticut Study	27
4.3 Reaction of Oxygenated Gasoline in New Jersey	28
4.4 Oxygenated Gasoline Continues with Less Media Coverage	35
4.5 Stricter Inspection to Begin	36
5 CONCLUSION	37
WORKS CITED	39

CHAPTER 1

INTRODUCTION

1.1 Air Pollution and the Clean Air Act Amendments of 1990

Air pollution control has been regulated by the federal government since 1963 when the original Clean Air Act was enacted. The law has been strengthened twice, most recently in 1990. One of the goals of the Act was to reduce carbon monoxide (CO) levels nationwide. New Jersey was one of thirty-seven areas around the country which had levels of CO which exceeded the upper threshold for allowable levels in the air. NJ was required to implement changes in order to decrease CO emissions and come into compliance with the regulation (1). Using gasoline with higher oxygen content in motor vehicles was one way to reduce CO levels.

In accordance with the Clean Air Act, NJ implemented a statewide oxygenated fuels program. From a measurement perspective, the state has seen a decrease in carbon monoxide levels. Oxygenated fuel probably contributed in achieving this goal. The southern region of New Jersey, has come in compliance with the federal standards and is no longer required to use oxygenated gasoline. The northern half of the state has also seen a decrease in the levels of carbon monoxide emissions, but because emissions levels occasionally exceed the acceptable CO levels, it still is required to use oxyfuel for at least one more winter (2).

1.2 Carbon Monoxide and Oxygenated Gasoline

Carbon monoxide is one of the many chemicals released into the atmosphere from motor vehicles which poses a special health risk to humans. Carbon monoxide is a colorless and odorless gas which is undetectable to humans. Once it enters the bloodstream, it robs oxygen from the blood feeding the body's vital organs and especially impacts the cardiovascular and central nervous systems (3). If undetected, death can result.

From a policy perspective, the use of oxygenated fuel for reducing CO emissions has come under attack by some interest groups for several reasons. Increased cost of oxygenated gasoline and decreased efficiency (fewer miles per gallon) are two common objections to the gasoline. Adding methyl tertiary butyl ether (MTBE), the oxygenate additive, to gasoline reduces CO levels which cleans the air clearly an environmental benefit. By increasing the oxygen content in gasoline, some of these emissions are reduced in the laboratory. With a higher gasoline to air ratio running through a vehicle, fewer hydrocarbons are released and more oxygen molecules become available to combine with carbon molecules to yield carbon dioxide (CO₂) rather than carbon monoxide (CO). Carbon monoxide emissions can be reduced between 10 and 25% with the addition of MTBE (4).

1.3 Health Concerns Associated with Methyl Tertiary Butyl Ether

Health concerns have also been raised. Hundreds of people in several different states across the country have complained of health ailments has been attributed to the most common oxygenate added to gasoline to increase oxygen content, MTBE.

Despite all the health objections to oxyfuel, it must be remembered that gasoline itself is a toxic substance. There are many by-products from gasoline that are released into the atmosphere when it is burned. Carbon monoxide is only one of the byproducts. There are other dangerous and potentially cancer causing chemicals released from gasoline combustion. Other byproducts are nitrogen oxide, and volatile organic compounds including aldehydes, olefins, hydrocarbons, benzene and toluene. Some of these additives are put into gas to improve octane and sharply reduced or completely eliminated when MTBE is added (5,6).

Oxygenated fuel has contributed to the reduction of carbon monoxide in the environment, but it is difficult to determine exactly how much of a factor it has been. Nevertheless, from both a political and environmental standpoint, the use of oxygenated fuel can be considered a success. Politically, the objective of cleaner air as outlined in the Clean Air Act is being achieved. Carbon monoxide levels have dropped by 95% in 21 metropolitan areas since oxygenated fuel's implementation in 1991-1992 (7). In NJ, levels have decreased by 14.9% since implementation (8).

The lingering question surrounds the health issue. Grassroots organizations across the country have organized and continue to fight against the use of MTBE in gasoline. Using NJ as a case study, the history of oxygenated fuel use will be analyzed.

1.4 The Clean Air Act Amendments of 1990 and its Impact on New Jersey

When the Clean Air Act was amended in 1990, there were 37 areas of the country which are in non-compliance of carbon monoxide national ambient air quality standards. A carbon monoxide non-attainment area is defined as an area in which CO emissions are over 9 parts per

million averaged over an eight hour period or 35 parts per million for a one hour period (9, 10). Carbon monoxide emission reduction was one of the four areas which the amendments, signed by President Bush in 1990, concentrated upon in Title II. Section 211(m) specifically outlines the clean air requirements standards and a way to reduce emissions through the use of oxyfuel (11). One of the four areas the act addressed that needed more stringent requirements to reduce pollution was motor vehicles.

Using oxygenated fuel is one way to reduce CO emissions from vehicles. The 1990 Amendments mandated that CO non-attainment areas must sell oxygenated gasoline during the months when "area[s] are] prone to high ambient concentrations of carbon monoxide" beginning on November 1, 1992 (12). This fuel must be sold for a minimum of four months and it must contain at least 2.7% oxygen by weight (13).

Nine metropolitan areas were specifically noted in the CAAA were required to use oxygenated gasoline as one way to reduce CO emissions. They were Baltimore, Chicago, Houston, Los Angeles, Milwaukee, New York City, Philadelphia, San Diego, and Hartford (14). The northern part of NJ falls within the NYC region. The thirteen northern counties, Bergen, Essex, Hudson, Hunterdon, Middlesex, Morris, Mercer, Monmouth, Passaic, Somerset, Sussex, Union, and Warren were required to use oxygenated gasoline from November 1 to April 30. The same program was only required until March 1 in the eight southern counties: Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester, Ocean, and Salem. Southern NJ falls is part of the Philadelphia airshed. New Jersey's air has in fact become cleaner since the implementation of this program, evident by the 14.9% drop in CO levels (15).

1.5 Factors Which May Contribute to Carbon Monoxide Reductions

Other factors may have contributed to the drop in CO levels. Weather can play a critical role. Cars need to idle longer in cold weather than in warm. Warmer winters would result in shorter idling times, thus fewer CO emissions. It also takes less time for the car to run efficiently, contributing to reduced air pollution contributed to motor vehicles (16).

Cars with oxygen sensors monitoring the oxygen to air ratio running through the engine have also helped. As time goes by, the older pollution causing cars are replaced by newer more technological and cleaner running cars. Gasoline in general also burns cleaner because of technological advances and better, more efficient cars (17).

The petroleum industry has suggested that the physical environment could possibly be contributing to health complaints (18). At a higher altitude, for instance, there is less oxygen in the atmosphere, thereby decreasing the combustibility of gasoline (19). Higher levels of pollution in the atmosphere increases the ratio of pollutants to oxygen in each breath which could increase symptoms.

Also, colder environments will also have more CO emissions because it will take longer for vehicles to warm up. Government officials from Alaska were quite vocal against the use of MTBE after health complaints surfaced following the implementation of an oxygenated fuels program. Many complaints were attributed to the smell of the gasoline. In response, the oil industry stressed that an offensive odor should not be mistaken with a health risk (20). A conclusion from an University of Alaska-Fairbanks study found the petroleum mixed with the MTBE was causing the strong odor, not the MTBE itself (21).

In NJ, the odor of the gasoline has been stronger on warmer days during the winter season. One worker at a gas station in Mendham said "It's [the smell] more noticeable on

hot days” (22). Others have noticed that the gasoline smells more when the temperature rises and the odor tends to be most noticeable when temperatures rise above 50 degrees (23,24).

Officials from the NJ Department of the Environment and Energy also note that if drivers are noticing a smell from their vehicles, their car is probably not running properly. It would not necessarily be the oxygenated gasoline producing an odor, but suggesting that it may be the owners of the vehicle’s fault. Additionally, it must be remembered that normal gasoline has an odor to it which is not pleasing to everyone (25).

Using New Jersey as a case study, I will examine the players and issues involved with the NJ oxygenated fuels issue. The program has contributed to cleaner air in the state. Health concerns have been raised and economic issues have also come into the picture. I will examine the NJ history as a story, with some background information, an overview of what other states have experienced, and examine what the future seems to hold for NJ with its oxygenated fuel use.

CHAPTER 2

THE ISSUES

2.1 What Is Oxygenated Fuel?

Oxygenated gasoline is conventional gasoline with oxygenate additives included in it. Adding oxygen to gasoline increases the combustion within the engine and reduces CO emissions. This is especially important in the winter months when CO levels rise (26). During colder weather, vehicles take a longer time to warm up to prevent stalling. While idling a vehicle, there is an increase in CO emissions because there is a higher gasoline to air ratio running through the system. By increasing the oxygen content, the fuel to oxygen ratio is more balanced (27). According to the Clean Air Act Amendments of 1990, NJ was required to use oxygenated fuel with a 2.7% MTBE content in order to reduce carbon monoxide emissions (28).

2.2 What Is MTBE?

The most common oxygenate additive utilized in oxygenated gasoline is methyl tertiary butyl ether (MTBE). It is a petroleum derived additive which when added to gasoline increases the oxygen content. It is primarily produced from methanol, which is produced from natural gas (29). Over 200 billion gallons of gasoline containing MTBE has been sold since 1979, when it was first added to gasoline (30). The amount of MTBE sold over the past few years has been increased by 10-20%, mainly from the implementation of MTBE use in gasoline (31).

2.3 Health Complaints and Reactions

MTBE enters the body primarily through breathing, where it is absorbed into the blood stream. Some people claim that exposure to MTBE can cause health problems. The eight symptoms most frequently associated with MTBE exposure are: headache, eye, nose, or throat irritation, cough, nausea, dizziness, and a sense of disorientation. Other less frequently cited symptoms linked with MTBE exposure are: fatigue, fever, sweats or chills, diarrhea, fainting or blacking out, skin irritation, muscle aches, and difficulty in breathing (32). Those affected by MTBE usually blame the offensive odor of the gasoline for making them feel ill. Across the state, gas station proprietors and attendants have listened to customer complaints of nausea, eye irritation and headaches since the gasoline was implemented (33). Similar complaints were voiced to the American Lung Association of New Jersey.

Shortly after the national oxygenated fuel program was implemented in November 1992, people in many states began to complain of physical symptoms of illness associated with MTBE (34,35). Since these claims arose shortly after the implementation of the oxygenated fuels program, they were linked to the oxygenated gasoline. In majority of these cases, the oxygenate used was MTBE. Consequently, it was targeted as the source of these health complaints.

Manufacturers of MTBE defend their product against the health complaints. According to James Cobb, Vice President for ARCO, at least 44 studies have been completed on the relationship between MTBE use and health. Findings fail to show direct correlation between MTBE and long term effects on humans (36). Dr. Gerhard Raabe, a representative for Mobil, also defended the additive, insisting that there was no documented evidence of

negative health impacts attributed to MTBE which has been in use since (37). A report by the White House's Office of Science Technology Policy finds "people (are) not at increased risk from acute health effects...due to the use of winter time blended with oxygenates like MTBE" (38).

One of the most recent and comprehensive studies examining this relationship was conducted by the Health Effects Institute. The HEI study titled "The Potential Health Effects of Oxygenates Added to Gasoline - A review of the Current Literature" was funded by the Environmental Protection and the Centers for Disease Control and Protection. The report highlighted a few important findings (39).

First, the environmental benefits outweigh the risk to a limited population. The study found most people do not experience symptoms from oxyfuel containing MTBE, however, short term exposure may result in discomfort to some people. Additionally, some people experience the same common symptoms like eye irritation, nausea, and headaches after short term exposure to conventional gasoline. Animal experiments research indicate there may be some risk associated with MTBE. An Italian study showed some laboratory rats and mice subjected to high levels of the chemical developed tumors and leukemia (40). This suggests that MTBE may be a health risk to humans, but does not definitively show a direct relationship. However a former EPA administrator felt that the comparison between rats and humans could not be founded because humans usually breathe in air containing MTBE while the rats ingested a MTBE and olive oil cocktail (41).

There does appear to be a relationship between oxygenated fuel use and increased asthma cases. Peter Joseph, a professor and researcher from the University of

Pennsylvania, suggests that a derivative of MTBE called tertiary butyl formate (TBF) may be causing the illnesses. Asthma in particular has been an increased problem across the country, especially in urban areas, since the implementation of oxygenated gas using MTBE as the additive. Despite the fact that the air is cleaner, and smog has decreased, reported cases of this respiratory problems have increased. Officials from ARCO Chemical Company dispute this suggestion claiming that the amount of MTBE in the air is so slight that the chemical reaction between MTBE and sunlight to create TBF is even smaller. The amount of TBF is so small, it should not have an impact on health (42).

Because anecdotal reports of acute health symptoms still occur, more long term research is needed to determine if there are any long term health risks. Even though there have been dozens of studies completed examining the relationship between MTBE and health complaints, there has seen no conclusive link in determining direct causality between the symptoms and the additive.

2.4 The Odor

Gasoline containing MTBE has a distinct odor. This odor has been experienced in NJ as well as other states across the country (43). The unusual odor prompted consumers to contact organizations to express their concerns and tell of feeling ill. As the temperature increased, so would the number of complaints (44). Mary Lamielle from the National Center for Environmental Health Strategies, a non-profit information gathering center, received several hundred phone calls between February and April 1993 reporting complaints attributed to oxygenated gasoline (45, 46).

However, oxygenated gasoline containing MTBE should not be any different than regular non-oxygenated gasoline. According to Jim Benton, vapor control systems at gas stations are supposed to collect vapors released during fuel fill ups (47). If a smell is present while refueling, there is either something wrong with the collection system, or the vehicle is not running cleanly (48). It is suspected that formaldehyde, not MTBE, may be causing the smell. Oxygenated gasoline containing MTBE was expected to cut formaldehyde emissions by 15%, but emissions have actually increased from between 10 and 15% according to 1995 data (49). This could be a particular cause of concern because formaldehyde is a known carcinogen.

Michael Berry from the NJ Department of Health said the new gasoline does have a distinct odor. People sometimes experience discomfort from its normal odor. Nevertheless, the health complaints prompted several organizations state governments, and federal agencies to investigate the concerns (50).

The EPA has been criticized on lack of movement in responding to health complaints. Mary D. Nichols, Assistant Administrator for Air and Radiation at the EPA, in response to the criticism states the "EPA places a very high priority on the public health benefits of improved air quality with respect to CO, ozone, toxic emissions and that is the reason for EPA's strong support for these programs "Continuation of oxyfuel program in best interest of public health" (51).

2.5 Other Air Quality Impacts from Oxygenated Fuel Use

In addition to a decrease of CO emissions, there have been decreases in other air pollutants. Across the country, other potentially dangerous air pollutants have been

decreased as well. Benzene levels have decreased and 1,3-butadiene levels are either slightly reduced or unchanged. Emissions of other air toxins, like formaldehyde and acetaldehyde however have increased. CO emissions are down 10 - 25%. This has occurred across the country. The study notes however that weather conditions, vehicle types on the road, the quantity of vehicles driving and the number of miles traveled may have also contributed (52).

CHAPTER 3

WHO IS INVOLVED?

3.1 Non-Government Organizations

There are a few organizations involved in New Jersey in the fight against oxygenated fuel. One in particular called Oxybusters has emerged as one of the most prominent organizations fighting to remove oxygenated gasoline from the market in New Jersey.

3.1.1 Oxybusters

The NJ chapter of Oxybusters was the first of several to organize. Founded by Barry Grossman in the summer of 1993, Oxybusters dedicates itself to the removal of oxygenated fuel from the pumps. He started having headaches after the implementation of the first oxygenated fuel season during the winter of 1992-1993. He told me that his wife made the correlation between his headaches and the warning stickers located on the pumps at the gas station indicating that MTBE was in the gasoline. He further researched the beginning of the oxyfuel season and after hearing about the problems of this gasoline in Alaska, and contacted *The Anchorage Times* for more information. After analyzing his symptoms with those found in Alaska, he began to publicize his concerns and Oxybusters was formed (53).

Members firmly believe that MTBE in the fuel is creating an unacceptable and unnecessary risk to the public. There are approximately 50 active members who try to educate the public about the potential dangers of MTBE. According to Grossman, the organization has gathered over 1000 documented cases of people who have fallen ill

because of what they believe is from MTBE exposure. Thousands of signatures have been gathered to petition the end of the oxygenated fuel program in New Jersey (54).

Grossman believes publicity is the key to their challenge. In order for people to know what they are up against, they need to be well informed. Oxybusters maintains that the Environmental Protection Agency did not test MTBE adequately to determine the potential human health impacts oxygenated fuel could cause. Group members have met with Governor Whitman, appeared on television and radio shows, have a web site, and have traveled extensively to visit other organizations which have popped up across the country with similar goals. Widespread recognition of the group has been in large part to radio station WKXW in Trenton and the ABC television program "Day One" which aired a segment on the potential problems associated with MTBE in January 1995 (55).

Groups similar to Oxybusters are located in Connecticut, Colorado, Arizona, North Carolina, Ohio, Texas, and Illinois. Because of the intensely personal impact oxygenated fuel has on their lives, people have become involved in the policy process by expressing their opinions and relating their experiences. By speaking out, they hope to influence policy decisions (56).

Oxybusters has been by far the most vocal non-government organization. Grossman leads the group of members who are passionate about the complete removal of gasoline containing MTBE from the pumps.

Surprisingly, other, larger non-governmental organizations like environmental, health, and public advocacy groups have given little attention to the entire oxygenated fuel and MTBE issue. Clean air is very important to good health and the impact that MTBE has had in cleaning the environment appears to be a positive one. Yet, there are

unanswered questions regarding health. What seems strange is that despite the tremendous impact a chemical such as MTBE can have on the lives of people, the unanswered questions and the issues that have been raised on this particular product, large well-known organizations have had little to do with the topic. They have done little more than state that air pollution and specifically carbon monoxide pollution, is a problem. In response to the health complaints, little more than “more studies are needed” is expressed. I have had the opportunity to interview several people from more well known organizations. Below are some of their comments.

3.1.2 American Lung Association and New Jersey Environmental Lobby

The American Lung Association and the New Jersey Environmental Lobby are two organizations which support legislation which promote a cleaner environment especially when it pertains to human health. Both organizations support clean air legislation, but are hesitant to endorse a product which could cause illnesses.

Blake Early, a consultant for the American Lung Association and former top executive of the New Jersey Sierra Club, supports oxygenated fuel use, according to one *Star-Ledger* article. However, he believes more research on MTBE is necessary. Early suggested that the media plays an important role in relating issues to the public. He explained to me that the level of health complaints seems to be proportional to media coverage. For example, he also pointed to Washington D.C., an area where oxygenated fuel is used but has had a low level of complaints with little media coverage and New Jersey, a state that used the same fuel, a greater level of media coverage, and a higher level of complaints. As an organization, the American Lung Association “doesn’t want to

endorse a product which makes people sick” and again pointed to the fact that more research is necessary (57).

The New Jersey Environmental Lobby is an organization which also supports clean air utilizing the method which will cause the least inconvenience, yet will have the greatest impact on air quality” (58). The Environmental Lobby supported the use of oxygenated fuel to achieve the means until health issues arose. Marie Curtis, Executive Director of the Environmental Lobby, believes that the health questions that arose depend upon the particular oxygenate in the gasoline. If MTBE is the problem, then, something else, perhaps ethanol, should be substituted. She is, however, still skeptical about the entire issue. Curtis stated that a lot of the information has been anecdotal without a lot of hard evidence backing it up. There are stories of people relaying that oxygenated gasoline smells bad and is the source of their headaches and nausea when in and around their cars. People need something to blame their health problems on and oxygenated fuel provided the scapegoat. She also told me that health complaints began two weeks prior to the implementation of oxygenated fuel in New Jersey. According to Curtis, there has been “a lot of jumping to conclusions” and more research is necessary (59).

3.1.3 NJ Chapters of Environmental Organizations

I was also able to talk to representatives from three other NJ organizations: the New Jersey Chapter of the Sierra Club, New Jersey Public Interest Research Group (NJPIRG) and the Association of New Jersey Environmental Commissions (ANJEC). Again, these three groups have very little to do with the oxygenated fuel issue despite the large impact these statewide organizations could have.

Tim Dillingham, from the New Jersey Chapter of the Sierra Club, told me his organization supported the Clean Air Act on a national level but has little to do with the impacts of the Clean Air Act Amendments the legislation on the state level (60).

New Jersey Public Interest Research Group, the group that could probably be the strongest, most vocal outlet in education the public and acting as its watchdog, has also had little to do with the issue. At the time of my interview, the group's transportation advocate was no longer with the organization. Even with someone in the position, I believe they would still not take an active role on the issue.

Curtis Fisher, Executive Director, explained to me briefly that NJPIRG was more concerned about the larger" implementation of the Clean Air Act than on the oxygenated fuel issue as it pertains to New Jersey. This organization's view is that the greater issue is the threat to public health. To this organization, clean air using oxygenated fuel is more important than a few health complaints (61).

The Association of New Jersey Environmental Commissions is involved with many state environmental issues but oxygenated fuel is not one of them. At one time, the organization worked with the Alliance for Environmental Education based in Washington D.C., according to Sandy Batty of ANJEC. I was advised to contact this group for more information. Further investigation into the Alliance for Environmental Education proved fruitless (62).

Marie Curtis, from Environmental Lobby, and Jimmy Moore, an active member of Oxybusters, both believe that the oil companies call the shots on how the oxyfuel issue is handled. Moore even compared oxygenates to "Hamburger Helper." He believes it is added to gasoline so people use more gasoline as a consequence of decreased mileage. To

the oil companies, more gasoline sold translates into more money. Money, in his view, is the biggest incentive to the oil companies to sell oxygenated gasoline (63).

Bill Dressler from the NJ Gasoline Retailers Association would agree with Jimmy Moore. He told me that even the oil companies were against oxygenated gasoline in the beginning, but after they realized there was a lot of money to be made, they began to sell oxyfuel (64).

As an advocate on the supply side, the New Jersey Petroleum Council is also against oxygenated gasoline. This organization believes that reformulated fuel, inspection reform, maintenance reform, and fleet turnover will be enough to decrease carbon monoxide levels (65).

3.2 New Jersey State Government

3.2.1 The New Jersey Department of Environmental Protection and Energy

The oxygenated fuel issue has been “unusual” in the lack of interest by non-government organizations according to Matt Polsky of the NJDEP. In his opinion, MTBE is a product which has not been adequately tested. He is puzzled by the lack of interest in the issue which has such a large impact on the public. In his view, there have only been two big players, Oxybusters, the grassroots citizens action group from central New Jersey, and the commodities market which is instrumental in pricing oil products (66).

3.2.2 The Whitman Administration

The Whitman administration has been pressured over the oxygenated fuel program, from her constituents and most notably from Oxybusters. For some, eliminating the oxygenated

fuel program is the only solution (67). For two and a half years, the Whitman administration paid little attention to the oxygenated fuel issue and the health complaints. Eventually there was a shift in the administration's policy. Perhaps the turning point was the presentation of over 5,000 signatures to the governor on the state house steps in the July 1994. After Whitman received the petitions, her administration actively pursued the possibility of removing oxygenated fuel from the marketplace. A more detailed account can be found below (68).

3.3 The Role of the Media

In the case of oxygenated fuel, the media has played an especially important role in guiding public perception. There are a few indications that the media may be portraying an unfair image on this particular issue, driving public opinion into almost mass hysteria. See the historical narrative below. People believe what they hear and read. Some reporting has, according to some, been lopsided toward the negative perspective. The public is driven by this knowledge and act, to some extent, without knowing the facts of both sides of the situation.

Nationally, media coverage began in January 1995 with the ABC television program "Day One" on oxygenated fuel. Prior to the airing of this segment, there were some health complaints registered to health departments nationwide, but calls significantly increased after the show was televised, seeming igniting public concern. Consequently, a study was conducted by the Wisconsin Department of Health and Social Services examined the relationship between media coverage reported and health complaints in May 1995 (69).

In the study called "An Investigation of Health Concerns Attributed to Reformulated Gasoline Use in Southeastern Wisconsin", it reported nationwide there were fewer than ten complaints reported to health agencies regarding fuel containing oxygenates prior to the program's air date. In March and April 1995, Connecticut received 82 complaints. Maine, Massachusetts, New Jersey, and North Carolina received an unspecified number. In Wisconsin, the number of phone calls to Wisconsin state authorities and the EPA's Region V office received 3,755 phone calls by the end of March 1995 (70). It should be noted that there was a significant number of duplicate callers in Wisconsin, much more so than in any other state.

The Wisconsin Department of Health and Social Services gathered its information by making phone calls by random digit dialing in three areas: Milwaukee and Chicago areas where RFG was used and Wisconsin areas of the state where reformulated gasoline was not used. Approximately 500 people from each category were contacted about RFG and asked questions pertaining to any knowledge of RFG use and any recent health problems. The results indicated that people in Milwaukee were more likely to have reported health symptoms linked to RFG than people from Chicago and elsewhere in Wisconsin. The two latter groups reported about the same number of complaints. People from Milwaukee and elsewhere in Wisconsin also were more likely to report symptoms if they were aware of purchasing RFG (71).

The final report highlights two key findings. First, media coverage was widespread in Wisconsin, so that complaints registered or symptoms reported by these two groups should not be surprising if the media's role of reporting to the public is seriously considered. As previously noted, 30 articles concerning RFG were published in

two Milwaukee newspapers were available statewide. In comparison, fewer articles about the RFG issue appeared in the *Chicago Tribune*. However, Milwaukee and Chicago receive RFG supplies from the same source. The gasoline pumped in Milwaukee should not be any different than gasoline sold in Chicago. Media coverage was much more prominent in Milwaukee, however, leading to the conclusion that the media played a big part in this controversy (72).

The large number of phone calls received in Wisconsin was likely to be attributed to several sources. Locally, more media coverage followed the "Day One" story. WISN, a major local television station, ran a week-long series entitled "Trouble in Your Tank". The news stories claimed newspaper reported, "falsehoods and innuendoes" about RFG which turned into a massive public campaign to urge the EPA to remove the gasoline from the market in Wisconsin. Between February 10 and February 25, 1995, 30 articles about RFG were reported in the *Milwaukee Journal* and *Milwaukee Sentinel*. Many of these were on the front page of the newspaper (73).

According to a report called "Reformulated Gas: Fact or Fiction," produced by the Citizens Commission for Clean Air in the Lake Michigan Basin, Wisconsinites were receiving "biased and wrong information" about reformulated gasoline. Alex Johnson, director of the organization, clearly believes the media is the cause of the problem because of its biased coverage. People were only hearing one side of the story and were jumping to conclusions. He and his organization believe that there was not "substance" to the health complaints reported by the people. He continued to tell me that some people believe there is no air pollution problem at all; the problems that do exist are a result of unnecessary government policies (74).

In New Jersey, newspaper articles have not been as numerous. From the *Newark Star-Ledger* approximately 20 articles about oxygenated fuel have appeared, the beginning after the oxyfuel season began in 1994. Unlike the articles from Milwaukee, most of these articles were not on the front page; instead they were usually located past the midway point of the first section. Tom Johnson, author of majority of the articles, chronicles the problem mostly through a policy perspective, detailing how the Whitman administration has dealt with the problem with attention to both those for and against oxyfuel.

Media has also played a role in Oxybusters' growth. Morning disc jockey Jim Gearhart from the NJ radio station WKXW allowed Oxybusters president Barry Grossman to talk about his headaches that started shortly after the implementation of MTBE in the gasoline. Grossman told me that, "the Oxybuster movement flourished" after he was able to talk on the air about his symptoms (75).

3.4 Manufacturers of MTBE

The petroleum industry, which manufactures MTBE, continues to stress their product is safe and cite research studies which indicate no direct health threat from the use of their product. Industry blames two sources for the uproar against their product. First, they call public reaction to MTBE as "mass hysteria". The manufacturers reference newspaper articles, radio talk shows, and television tabloid shows like "Day One" which have each reported on the potential risks associated with MTBE and in their opinion, exploited the issue. Secondly, the petroleum industry blames the agricultural sector for a "conspiracy" against their product. The second most common oxygenate is ethanol. It is produced primarily from either corn or other biomass, products of the agricultural industry.

Manufacturers believe that the agricultural industry is creating this negative press against MTBE in order to obtain a greater share of the oxygenate market (76).

Not all involved with MTBE production agree the additive is problem free. The president of the American Methanol Institute also claims that MTBE has not been studied enough, despite the fact that MTBE has been studied for the past 25 years and no study has concluded MTBE is safe when used as intended. The executive director of the Oxygenated Fuels Association proclaims that MTBE is not a health problem, but instead is a health solution referencing improved air quality statistics between 1992 and 1995. Blake Early, a consultant from the American Lung Association, also sides with the industry, saying that clean air overrides the "unexplained" health complaints. According to him, more studies are needed, but at worst MTBE, a possible carcinogen, is replacing benzene, a known carcinogen (77). John Elston, from the DEPE's Department of Air Quality says that the ban on MTBE proposed by the state assembly is "unwarranted, unwise, and probably illegal" (78).

There are no studies which indicate a direct causal relationship between illnesses according to the DEPE. Even if there is some link between MTBE use and illnesses, there are many who would agree that the benefits to the majority of the population and improvements in air quality outweigh the risks that might occur to a "sensitive" portion of the population. Despite this, the DEPE hoped that oxygenated fuels program could come to an end in New Jersey (79).

3.5 Trade Organization

Oxygenated Fuels Association (OFA) is the major trade organization dealing with the oxfuel issue. Founded in 1983, this international trade association dedicates itself “to advance the use of oxygenated fuel additives to improve the combustion performance of gasoline, thereby significantly reducing automotive tailpipe pollution.” Its purpose is to gather, develop and analyze “technical information on the blending, performance, handling, health benefits and environmental properties of oxygenates used in gasoline” (80).

OFA works with federal, state, and local governments, national health organizations, environmental groups, and major allied industries, such as automotive manufacturers, oil companies, and gasoline marketers and other interested parties. The organization has also sponsored numerous technical analyses and health science studies showing the automotive performance and health benefits of oxygenated fuels. Members of the organization are: Arco Chemical Company, CDTECH (Catalytic Distillation Technologies), ECOFUEL, Enron Clean Fuels Company, Huntsman Corporation, Methanex Incorporated, Neste Oy, Sabc Americas Incorporated, Texaco Refining and Marketing, Texas Petrochemicals Corporation, United Catalysts Incorporated, and Valero Marketing and Supply Company (81).

3.6 New York Mercantile Exchange

Contracts for future delivery of commodities of crude oil, heating oil, gasoline, and natural gas are traded on the New York Mercantile Exchange (NYMEX). The exchange has played an important role in the New Jersey story, forcing the state to keep the additive by

bringing New Jersey to court. NYMex became vocal after Governor Whitman announced that NJ would end the oxygenated fuel program statewide two months early in 1995. This group has a large economic interest with the oxygenated gasoline industry. Any changes in future gasoline consumption has an impact on this market. If a decision is made to suspend the oxygenated fuel program, they need to know as soon as possible so gasoline supplies can flow without disruption (82).

CHAPTER 4

HISTORY OF THE NEW JERSEY STORY

4.1 New Jersey Implements the Clean Air Act Amendments

As federally mandated, New Jersey's oxygenated fuel program began in the Fall of 1992. The oxyfuel controversy began when it was determined that NJ was going to be split into two sections, north and south. The northern counties would be required to use oxyfuel from November 1 until April 30. The southern part of the state would only be required to use the gasoline until March 30. It was anticipated that a vehicle's fuel mileage would drop slightly, two to three percent and the price would initially increase because of the added cost to produce oxygenated gasoline. Because of these two factors, there was the concern that people from the northern areas would cross into the southern ones after March 30 to purchase gasoline because it would be less expensive and perform better (83).

Shortly after the program was implemented, people began to complain of headaches, dizziness, and decreased respiratory rates when around this particular gasoline. The health complaints were received primarily by the New Jersey Gasoline Retailers Association. The Retailers Association is an organization which is minimally involved with oxygenated fuel issues. It primarily concerns itself with the rights and obligations of the gasoline retailers. Health complaints received by this group were referred to Oxybusters (84).

Nationally, it appeared that the health complaints were most numerous after some form of media publicity registered health concerns to the local authorities and

organizations (85). There appeared to be no pattern in the complaints within New Jersey. They were not appearing in one localized area or among one particular group of people. People who worked in gas stations or around motor vehicles were more likely to experience ill effects which were attributed to MTBE in the gasoline, but not all did. Studies have indicated that people who are employed at gas stations have higher concentrations of MTBE in their bloodstream, but again amounts vary. Those with the highest levels were also not necessarily the ones who became ill (86).

4.2 Health Research from a Stamford, Connecticut Study

A joint study undertaken by Connecticut health officials and the Centers for Disease Control and Prevention examined the links between health symptoms and MTBE in oxygenated fuels in Stamford, Connecticut. Their research looked at people whose occupations keep them in close proximity of vehicles throughout the day. There were three main groups of participants involved in the study: people who work inside garages (auto mechanics for instance), gasoline attendants, and members of Stamford's traffic and sanitation departments. These groups of people were asked to submit blood samples to measure MTBE levels in the body and answer a survey inquiring about the common health complaints. Personal-breathing-zone samples were also obtained at the work place to measure MTBE levels in the ambient air. Several other staff members who work in Stamford's main city office building were recruited to answer questionnaires to serve as a comparison group (87).

On the whole, it was found that gas station attendants had the greatest levels of MTBE in their blood. In general, the participants who worked around vehicles for a good part of the day had higher levels of MTBE in their systems and a higher rates of symptoms than the group

of office workers studied. Additionally, muscle aches and fatigue which are not among the most common symptoms were also reported by those with higher levels of MTBE (88).

4.3 Reaction of Oxygenated Gasoline in New Jersey

Within six months, the New Jersey legislators began to react to the complaints. The Assembly Regulation Oversight Committee voted on a resolution approving the suspension of the oxygenated fuels program. Several members of the state assembly were calling for an end to the oxygenated fuel program. A further bill called for the prohibition of MTBE as the oxygenate. Jim Wallwork, a 1993 candidate for governor, was also calling for the end of the program, even if it would mean federal repercussions (89).

The DEPE petitioned the EPA on June 23, 1993 requesting that the northern and southern sections of the state be combined to have one uniform oxygenated fuel program. Documentation and air quality analysis demonstrated air quality in northern NJ had improved by 15% since 1990. The decrease in air pollutants appeared to justify the request of having the northern section's mandated sale of oxygenated gasoline decreased from seven to four months. Critics of this plan were concerned that reducing the oxygenated fuel season in the northern counties would reexpose the population to an increased carbon monoxide risk. (90).

In March 1994, the DEPE petitioned the federal government to put an end to the oxygenated fuels program. The petition requested an end the oxygenated fuel requirement by January 1995 and asked some areas located within non-attainment areas that had not exceeded carbon monoxide limits, be removed from the non-attainment list. The state contended that terminating the oxyfuel program would not jeopardize the air quality

because more stringent emissions inspections would be implemented soon and there was a federal requirement on oil companies to produce "a cleaner-burning fuel" which would also reduce emissions (91).

Despite the attempts by state legislators, gasoline containing MTBE was back at the pumps for the start of the 1994-95 oxyfuel season (92). This season would be a little different from the past two. New Jersey had experienced a few CO violations in 1994. The state was hoping to prove that although the violations occurred, new controls scheduled to be implemented would keep NJ within compliance of the clean air requirement, without the use of oxygenated gasoline. The first violation occurred on February 19, which was caused by a weather condition called a temperature inversion. Up until that time, NJ had gone two years without a carbon monoxide violation (93). Another violation occurred in December and the state came close to a third violation before the end of the year. The DEPE continued to stress that air conditions have improved across the state since its implementation in 1992 (94). To many, the violations were seen as a weakness to NJ's case to drop the oxygenated gasoline requirement (95).

Officials from the state and oil industry representatives met in January 1995 to discuss the possibility of lowering the percentage of MTBE, partly in response to the public's complaints of the smell and illnesses associated with the additive. Although no definitive answers were reached, after this discussion, it was believed that oil refiners would voluntarily begin to reduce MTBE levels. The DEPE wanted MTBE manufacturers, and oxygenated fuel suppliers to lower the MTBE content in gasoline by 25% in January 1995. This would decrease the oxygen content in gasoline from 2.7% to 2.0%. The gasoline would no longer be oxygenated. It would now be reformulated

gasoline because of the decrease in oxygen content. The DEPE thought that a 2.0% oxygen content would be below the human threshold of odor identification, thus resulting in fewer illnesses attributed to the fuel. Reducing MTBE content would be less of a disruption in the market place than a complete ban on the product. The key to this proposal was convincing the EPA to accept it, since the change would occur midway through an oxyfuel season. It was believed that tougher inspection scheduled to start by January 1995 and the use reformulated gasoline would meet clean air requirements, eliminating the need for oxygenated gasoline (96).

In early February 1995, two and a half years after the implementation of the oxygenated fuels program, the Whitman administration formally took action steps to suspend the sale of the oxyfuel in the state. The state formally requested the EPA to permit a decrease in the oxygen content in gasoline, dropping it from 2.7% to 2.0%. It was hoped complaints would end with the lower oxygenate content. Additionally, March 1 marked the date when two types of gasoline would be sold in NJ. Suspending the program statewide on March 1, would prevent two types of gasoline sold within the state. Arthur Zadrozny from the OFA noted that it seemed justifiable to drop the oxyfuel content in March and April since the state has had no CO violations in those months since 1991. According to Michael Karlovich of the Bayway Refining Company, officials in the oil industry were ready to switch to gasoline with a lower oxygenate content, but they needed an official action by the state to do so (97).

In addition, asking the EPA to end the oxyfuel program on March 1, Robert Shinn, Commissioner of the DEPE, hoped that NJ would be able to sell only reformulated gasoline the next winter season, instead of the oxygenated gasoline. He also

acknowledged that the state is far behind in implementing its stricter auto emissions inspection program. At the time, the plan had been submitted to the EPA, but the state legislature had still not approved the plan (98).

In response to Whitman's announcement, the commodities market was sent into confusion, halting trades of gasoline futures for 40 minutes after the opening of the market. The impact this decision created uncertainty on future oxygenated gasoline demand. The New York Mercantile Exchange, the market which trades contracts for future delivery of commodities, was extremely concerned about the impact this decision would have on the marketplace (99). They had a special interest in keeping oxyfuel flowing or serious gasoline shortages could be possible. In reaction to Whitman's decision, futures prices quickly dropped. "Turmoil" erupted in the market because of uncertainty over futures demand and gasoline prices to the consumer and supplier.

On February 3, 1995 the EPA announced that New Jersey could suspend the program for the remainder of the season, since there had been no CO violations in March or April since 1991. The EPA was cautious, however, reiterating that it may be necessary to begin the oxygenated fuel program again in November (100). Four days later, Whitman signed a piece of legislation allowing the halt of oxygenated fuel delivery (101). Refiners were permitted to produce and ship reformulated gasoline with a MTBE content of 2.0%. It was thought that gasoline with a 2.0% oxygenate content would be below the threshold which the offensive odor would be detectable. It was the hope that the complaints about the fuel would end. The day after the EPA's announcement, newspaper reports showed that the decision by the Whitman administration was due in large part to public pressure and customer complaints (102).

Consequently, New Jersey's decision also caused New York and Connecticut to rethink their future of oxygenated gasoline sales (103). The sale of oxygenated gasoline was required in these states as well and if NJ was allowed to suspend the program, there would be a possibility of other states asking for the end of oxyfuel use. New York officials from the Department of Environmental Conservation noted it would be wise to examine the air quality issue on a regional basis (104).

NYMEX was also satisfied with Whitman's actions because it would provide some stability to the gasoline market. It also ensured that there would be no disruption in gasoline flow. Additionally, both New York and Connecticut decided to keep oxyfuel flowing until the end of April as they were required. This decision was anticipated to help put calm into the market place (105).

On February 7, 1995, Governor Whitman formally gave the approval to the oil companies to stop shipping oxygenated gasoline and instead start sending reformulated gas with a 2.0% MTBE content beginning February 8 (106).

NYMEX discovered that NJ did not want to sell oxygenated gasoline for the upcoming 1995-96 winter season. Consequently, NYMEX brought a lawsuit against NJ in May 1995. The Exchange wanted to ensure that fuel contracts already in place would still be valid and minimize the disruption in fuel flow. NYMEX President Patrick Thompson stressed that the exchange did not want NJ to go through with its plan because it is "in direct violation of the Clean Air Act and will cause immediate and irreparable damage to the Exchange, its members and customers." John Elston from the DEPE criticized the lawsuit because it reflected the "narrow NYMEX interests" (107).

During the summer of 1995, Oxybusters presented the Governor Whitman over 15,000 signatures of people who were protesting the use of oxygenated gasoline. At the end of September, Whitman officially announced that NJ would not participate in the 1995-96 oxygenated fuel season, scheduled to start in a few days. Oxybusters' efforts certainly was instrumental in the administration's decision. Robert Shinn, Commissioner of DEPE, said, "Considering the extent of complaints...it is only prudent to end the program at this time" (108).

The oil companies were outraged and wondered what they should do with the oxygenated fuel ordered and coming on line into the system. Subsequently, the New York Mercantile Exchange brought New Jersey to court again because suspending the sale of oxygenated fuel would throw the commodities market into an upheaval and create an excess stock of gasoline that no one would want to purchase. NYMEX was also upset because it created uncertainty for the future of oxygenated gasoline sales. Exchange officials claimed not complying with the act would "cause immediate and irreparable damage to the Exchange, its members and customers." By May 1995, NYMEX already had contracts for winter fuel for the upcoming season; NJ's decision not to use the gasoline, would impact the futures already sold. At that time, futures were only out for one year. Futures usually stretched eighteen months (109).

According to a NYMEX press release on September 28, 1995, New Jersey would have to abide by the regulations set forth by the Clean Air Act Amendment, unless the state received a waiver from the EPA to suspend the program if there was compliance with clean air standards. Because neither of these conditions were satisfied when New Jersey stated they would suspend the program the original suit was filed (110).

In response to NJ's action, on October 2, 1995, federal judge Anne Thompson ruled that NJ did not have the power to override federally mandated legislation. NJ was in violation of the Clean Air Act because it did not ask the EPA for permission to drop the oxygenated fuel. The ruling was in favor on NYMex. She stated that New Jersey must sell oxygenated fuel in order to comply with federal clean air legislation. She continued stating New Jersey knew when it submitted a clean air program to the EPA in 1992, which included oxygenated fuel use, it needed to be included in the state's plan. (111).

A spokesman for the DEPE said the state was disappointed with the ruling and would appeal the decision. NYMex was satisfied with the decision. Oxybusters and the NJ Petroleum Council were not. Oxybuster's President Barry Grossman said, "just goes to show you that the concerns of people's health is secondary to big business" (112).

NJ quickly appealed the ruling, asking the judge to delay the beginning of the 1995-96 oxyfuel season. About ten days later, Judge Thompson ruled that there is no evidence of health problems related to oxygenated gasoline and there is no reason why MTBE should not be used in gasoline. Oxyfuel has been instrumental in the reduction of carbon monoxide emissions in New Jersey. Continuation of the program is necessary. Additionally, it also appeared the EPA would not waive the requirement for oxygenated gas (113).

The EPA would make a change in the policy. In late October, the EPA ruled that the southern portion of the state would no longer have to use oxygenated gasoline because its air quality had reached acceptable levels, and was in compliance with the Clean Air Act. There had not been a violation in the eight southern counties since January 1989. Five areas of northern NJ were now also in compliance: Somerville, Freehold, Toms

River, Perth Amboy, and Morristown. These areas, however, still needed to comply because the complete northern region was still in non-compliance with the law (114).

Part of the reason why southern NJ was allowed to drop the oxygenated fuels program was also because there was an agreement reached between NJ and Pennsylvania. Southern NJ falls within the Philadelphia airshed. A similar agreement would be needed between NJ and its northern neighbors, New York and Connecticut (115).

4.4 Oxygenated Gasoline Continues with Less Media Coverage

Print media coverage for the 1995-96 oxygenated fuel was completed with only two news articles in the *Newark Star-Ledger*. The first introduced the fact that oxygenated fuels would be back at the pumps for the upcoming winter. The second only mentioned a study that was supposed to be funded by ARCO Chemical Company, but it was canceled because the company reneged on their financial commitment (116).

Curiously, the 1996-97 oxyfuel season experienced even less media coverage than its predecessor. Shortly before the end of the 1996-97 oxygenated fuel program in the northern section of the state, it was predicted that New Jersey would once again petition the EPA to end the program. Two years passed since there was a carbon monoxide violation in the state. Officials from the EPA would not predict whether or not the state would be allowed to drop the program for the winter of 1997-98. New York and Connecticut would need to approve New Jersey's plan because their air could be affected if oxygenated gasoline is not sold and air quality worsens. New Jersey would also need to implement its long awaited revamped inspection program (117).

At the end of August 1997, it was announced that an agreement had been reached between New Jersey, New York and Connecticut. Both New Jersey and Connecticut would utilize oxygenated fuel for one more winter season, but New York decided to postpone the decision and reevaluate the need at the end of the winter (118).

On November 1, 1997, oxygenated fuel season number six began. It is expected that the program will continue until March. The EPA suggested that the 1997-98 season would probably be the last, as long as the long awaited program was implemented. At the time, the implementation was at least two to three months behind schedule, but officials from the governor's office conceded it could be two more years before the system was fully operational. Shinn disagreed with Department of Motor Vehicles officials on the timetable. He believed that vehicles could be voluntarily tested with the new standard within a few weeks (119).

4.5 Stricter Inspection to Begin

In August 1998, the EPA announced that oxygenated fuel would be back at the pumps for one, but possibly two, more winters. The tougher emission standards were implemented on a voluntary program beginning September 1, 1998. Vehicles that pass the emissions test would be issued a two year inspection sticker. Even though this program would be in effect, the EPA wants to evaluate the effectiveness of the new inspection program. Since the inspection system will not be in full effect until January 1999, NJ it seems that the state will need to use oxygenated fuel for at the 1998-1999, which started on November 1, 1998 for the northern part of the state, and possibly for the 1999-2000 oxygenated fuel season (120).

CHAPTER 5

CONCLUSION

Chronicling the NJ story through the six complete oxygenated fuel winter seasons, evidence shows that NJ is moving in the right direction in improving its air quality. Using oxygenated gasoline from November through March has contributed to decreases in carbon monoxide in the air. This is evident from the drop in carbon monoxide violations across the entire the state and the fact the southern New Jersey was allowed to stop selling oxygenated gasoline in 1995.

Despite the health concerns that have been raised throughout the country, and accusations that the additive MTBE has not been studied enough, research has occurred since its implementation in Denver, Colorado in 1979. Over 40 studies have been completed on this additive. No study has shown a conclusive link between health complaints and MTBE. Although all the complaints continue, and organizations such as Oxybusters remain committed to the removal of MTBE from the marketplace. The Environmental Protection Agency and other non-government organizations seem to be more concerned with total air quality, not the complaints of a people who experience discomfort from oxygenated gasoline odor.

After several years of delay, New Jersey has finally implemented its stricter inspection program. Once the evaluation period is completed, the EPA will probably allow the state to drop its oxygenated fuel requirement, as long as New Jersey can show that the new inspection program can prove that it can keep air quality standards in compliance with the Clean Air Act Amendments of 1990.

More studies are clearly needed on the long term impact of MTBE use in gasoline and its impact on health. This has been suggested in many conclusions of research studies. Recently, MTBE levels have been detected in groundwater supplies, adding to the already present health concerns.

Oxybusters should continue on its quest to educate the public as long as it supplies clear evidence of health impacts. The organization at times seems to passionately react to health complaints without clear documentation backing up its claims, using only the anecdotal accounts from its members as evidence.

The media has played an interesting role in this issue since it appears that in areas where there has been a lot of media coverage, there is a proportional increase in the number of health complaints. In New Jersey, this has not been the case. There has been no increase in health complaints following media coverage. On a state level, print coverage has also not been intense as in other areas on the country. With lack of widespread media coverage in New Jersey, this could be part of the reason why traditional non-government organizations such as the Sierra Club and the American Lung Association have not taken a special interest in the issue.

WORKS CITED

1. Johnson, Tom. "Officials See Controversial Oxygenated Fuel As A Must During Winter" *Newark Star-Ledger*. 27 April 1993 <<http://www.nj.com/archive/>>.
2. Tedeschi, Bruno. "One More Winter of Treated Gas in NJ." *Bergen Record*. 26 Aug 1997, sec.I: 4.
3. United States Environmental Protection Agency. *Assessment of Potential Health Risks of Gasoline Oxygenated with Methyl Tertiary Butyl Ether (MTBE)*. Nov. 1993.
4. Johnson, Tom. "Officials See Controversial Oxygenated Fuel As A Must During Winter" *Newark Star-Ledger*. 27 April 1993 <<http://www.nj.com/archive/>>.
5. Cohen, Robert. "Clean and Mean." *Newark Star-Ledger*. 12 Dec 1994 <<http://www.nj.com/archive/>>.
6. Fumento, Michael. "What Kind of Fuel Am I?" *American Spectator*. Nov. 1990: 25-31.
7. Johnson, Tom. "Council Urges More Study on Gasoline Additive." *Newark Star-Ledger*. 12 June 1996 <<http://www.nj.com/archive/>>.
8. Johnson, Tom. "Knocking the Rules." *Newark Star-Ledger*. 11 March 1993 <<http://www.nj.com/archive/>>.
9. Rowe, Robert D. et. al. "Using Oxygenated Fuels to Mitigate Carbon Monoxide Air Pollution: The Case of Denver." *Contemporary Policy Issues*. Jan. 1990: 39-10.
10. Waxman, Henry, et.al. *Cars, Fuels, and Clean Air: A Review of Title II of the Clean Air Act Amendments of 1990*. Northwest School of Law of Lewis and Clark College. 1991.
11. Waxman, Henry, et.al. *Cars, Fuels, and Clean Air: A Review of Title II of the Clean Air Act Amendments of 1990*. Northwest School of Law of Lewis and Clark College. 1991.
12. Waxman, Henry, et.al. *Cars, Fuels, and Clean Air: A Review of Title II of the Clean Air Act Amendments of 1990*. Northwest School of Law of Lewis and Clark College. 1991.
13. Rowe, Robert D. et. al. "Using Oxygenated Fuels to Mitigate Carbon Monoxide Air Pollution: The Case of Denver." *Contemporary Policy Issues*. Jan. 1990: 39-50.

14. Orr, J. Scott. "EPA Tabs Ethanol as its Fuel Additive of Choice." *Newark Star-Ledger*. July 1994 <<http://www.nj.com/archive/>>.
15. Johnson, Tom. "Knocking the Rules." *Newark Star-Ledger*. 11 March 1993 <<http://www.nj.com/archive/>>.
16. "British Question Use of Oxygenates in Gasoline." *Oil and Gas Journal*. 10 April 1995: 40.
17. "British Question Use of Oxygenates in Gasoline." *Oil and Gas Journal*. 10 April 1995: 40.
18. Crow, Patrick. "Oxygenates Stir Legal Scuffle." *Oil and Gas Journal*. 18 July 1994: 27.
19. Rowe, Robert D. et. al. "Using Oxygenated Fuels to Mitigate Carbon Monoxide Air Pollution: The Case of Denver." *Contemporary Policy Issues*. Jan. 1990: 39-50.
20. Illman, Deborah. "Oxygenated Fuel Cost may Outweigh Effectiveness." *Chemical and Engineering News*. 12 Nov 1993: 28-29.
21. Williams, Bob. "MTBE, Ethanol Advocates' Squabble May Complicate RFG Implementation." *Oil and Gas Journal*. 13 Feb 1995: 17 - 22.
22. Johnson, Tom. "New Cleaner-Burning Gasoline is Making Some Jersey Motorists Sick." *Newark Star-Ledger*. 3 Dec 1992 <<http://www.nj.com/archive/>>.
23. Sherman, Ted. "Price of Gasoline Edges Downward But Remains Higher Than Year Ago." *Newark Star-Ledger*. 17 Jan 1993 <<http://www.nj.com/archive/>>.
24. Sherman, Ted. "Jersey Air Quality Shows Marked Improvement; DEPE Points to New Fuels." *Newark Star-Ledger*. 26 Jan 1993 <<http://www.nj.com/archive/>>.
25. Johnson, Tom. "New Cleaner-Burning Gasoline is Making Some Jersey Motorists Sick." *Newark Star-Ledger*. 3 Dec. 1992 <<http://www.nj.com/archive/>>.
26. Matthews, Downs. "Cleaner Fuels for Cleaner Air." *The Lamp*. Summer 1994: 13-20.
27. Rowe, Robert D. et. al. "Using Oxygenated Fuels to Mitigate Carbon Monoxide Air Pollution: The Case of Denver." *Contemporary Policy Issues*. Jan. 1990: 39-29.
28. Waxman, Henry, et.al. *Cars, Fuels, and Clean Air: A Review of Title II of the Clean Air Act Amendments of 1990*. Northwest School of Law of Lewis and Clark College. 1991.

29. American Automobile Association. *AutoGram*. Jan/Feb 1995.
30. Oxygenated Fuels Association. Oxygenated Fuels Used by Autos Since 1970. 18 Jan 1995.
31. "Methyl Tertiary-Butyl Ether." 17 March 1997.
32. Moolnaar, Ronald L., et. al. "Methyl Tertiary Butyl Ether in Human Blood After Exposure to Oxygenated Fuel in Fairbanks, Alaska." *Archives of Environmental Health*. Sept./Oct. 1994: 402-409.
33. Johnson, Tom. "New Cleaner-Burning Gasoline is Making Some Jersey Motorists Sick." *Newark Star-Ledger*. 3 Dec 1992.
34. Moolnaar, Ronald L., et. al. "Methyl Tertiary Butyl Ether in Human Blood After Exposure to Oxygenated Fuel in Fairbanks, Alaska." *Archives of Environmental Health*. Sept./Oct. 1994: 402-409.
35. Williams, Bob. "MTBE, Ethanol Advocates' Squabble may Complicate RFG Implementation." *Oil and Gas Journal*. Feb. 13, 1995: 17 - 22.
36. Johnson, Tom. "GOP Legislator Pledges All-Out Effort Against 'Cleaner Burning' Gasoline." *Newark Star-Ledger*. 1 April 1993 <<http://www.nj.com/archive/>>.
37. Johnson, Tom. "Officials See Controversial Oxygenated Fuel as a Must During Winter." *Newark Star-Ledger*. 27 April 1993 <<http://www.nj.com/archive/>>.
38. "Oxygenated Gasoline Gets Green Light From Multi Agency Government Review" 2 July 1997 <<http://www.cleanfuels.net>>.
39. Health Effects Institute. *The Potential Health Effects of Oxygenates Added to Gasoline*. Feb. 1996.
40. Page, Peter. "Gas Additive Makers: Cancer Link is Unfounded." *The Times of Trenton*. 14 March 1995 <<http://www.nj.com/archive/>>.
41. Page, Peter. "Expert Ties Asthma to MTBE Derivative" *The Times of Trenton*. 12 July 1998 <<http://www.nj.com/archive/>>.
42. Johnson, Tom. "New Cleaner-Burning Gasoline is Making Some Jersey Motorists Sick." *Newark Star-Ledger*. 3 Dec 1992 <<http://www.nj.com/archive/>>.
43. Johnson, Tom. "New Cleaner-Burning Gasoline is Making Some Jersey Motorists Sick." *Newark Star-Ledger*. 3 Dec 1992 <<http://www.nj.com/archive/>>.

44. Johnson, Tom. "Officials See Controversial Oxygenated Fuel As a Must During Winter." *Newark Star-Ledger*. 27 April 1993 <<http://www.nj.com/archive/>>.
45. Johnson, Tom. "GOP Legislator Pledges All-Out Effort Against 'Cleaner Burning' Gasoline." *Newark Star-Ledger*. 1 April 1993 <<http://www.nj.com/archive/>>.
46. Johnson, Tom. "Officials See Controversial Oxygenated Fuel As a Must During Winter." *Newark Star-Ledger*. 27 April 1993 <<http://www.nj.com/archive/>>.
47. Moore, Elizabeth. "Jersey Gas Prices Rise As Oxy-fuel 'Kicks In'." *Newark Star-Ledger* 29 Sept. 1994 <<http://www.nj.com/archive/>>.
48. Johnson, Tom. "New Cleaner-Burning Gasoline is Making Some Jersey Motorists Sick." *Newark Star-Ledger*. 3 Dec 1992 <<http://www.nj.com/archive/>>.
49. Peters, Eric. "A Noxious Mandate." *Wall Street Journal*. 27 Feb 1997, sec. I: 6.
50. Johnson, Tom. "New Cleaner-Burning Gasoline is Making Some Jersey Motorists Sick." *Newark Star-Ledger*. 3 Dec 1992 <<http://www.nj.com/archive/>>.
51. "Oxygenated Gasoline Gets Green Light From Multi Agency Government Review" 2 July 1997 <<http://www.cleanfuels.net>>.
52. "Oxygenated Gasoline Gets Green Light From Multi Agency Government Review" 2 July 1997 <<http://www.cleanfuels.net>>.
53. Grossman, Barry. Personal Interview 17 Nov. 1998.
54. Grossman, Barry. Personal Interview. 14 March 1996.
55. Grossman, Barry. Personal Interview. 14 March 1996.
56. Emond, Mark. "Widespread Health Complaints About RFG, MTBE Raise Concerns Over Program's Fate." *National Petroleum News*. April 1995: 35-41.
57. Early, Blake. Personal Interview. 14 Feb. 1996.
58. Curtis, Marie. Personal Interview. 14 Feb. 1996.
59. Curtis, Marie. Personal Interview. 14 Feb. 1996.
60. Dillingham, Tim. Personal Interview. 14 Feb. 1996.
61. Fisher, Curtis. Personal Interview. 7 March 1996.

62. Batty, Sandy. Personal Interview. 29 Feb 1996.
63. Moore, Jimmy. Personal Interview. 14 March 1996.
64. Dressler, Bill. Personal interview. 1 April 1996.
65. Johnson, Tom. "U.S. Official Hints Jersey is Unlikely to Gain Oxygenated Gasoline Waiver." *Newark Star-Ledger*. 13 Oct. 1995 <<http://www.nj.com/archive/>>.
66. Polsky, Matthew. Personal interview. 14 March 1996.
67. Bishop, Gordon. "Wallwork sees Oxy-Mandate as Quite Fuelish." *Newark Star-Ledger*. 19 Oct. 1995 <<http://www.nj.com/archive/>>.
68. EPA's Policy to Add Oxyfuel is 'Oxymoronic.'" *Newark Star-Ledger*. 5 Oct. 1994.
69. Wisconsin Department of Health and Social Services. *An Investigation of Health Concerns Attributed to Reformulated Gasoline Use in Southeast Wisconsin*. May 1995.
70. Wisconsin Department of Health and Social Services. *An Investigation of Health Concerns Attributed to Reformulated Gasoline Use in Southeast Wisconsin*. May 1995.
71. Wisconsin Department of Health and Social Services. *An Investigation of Health Concerns Attributed to Reformulated Gasoline Use in Southeast Wisconsin*. May 1995.
72. Wisconsin Department of Health and Social Services. *An Investigation of Health Concerns Attributed to Reformulated Gasoline Use in Southeast Wisconsin*. May 1995.
73. Wisconsin Department of Health and Social Services. *An Investigation of Health Concerns Attributed to Reformulated Gasoline Use in Southeast Wisconsin*. May 1995.
74. Johnson, Alex. Personal Interview. March 7 1996.
75. Grossman, Barry. Personal Interview. 17 Nov. 1998.
76. Emond, Mark. "Widespread Health Complaints About RFG, MTBE Raise Concerns Over Program's Fate." *National Petroleum News*. April 1995: 35-41.
77. Early, Blake. Personal Interview. 14 Feb. 1996.

78. Johnson, Tom. "Hearing on Cleaner Fuel Pumps Out Opposition to Oxygenated Fuels Effects." *Newark Star-Ledger*. 28 Oct. 1994 <<http://www.nj.com/archive/>>.
79. Johnson, Tom. "Ruling Exempts South Jersey from Oxyfuel Use." *Newark Star-Ledger*. 25 Oct. 1995 <<http://www.nj.com/archive/>>.
80. "Oxygenated Gasoline Gets Green Light From Multi Agency Government Review" 2 July 1997 <<http://www.cleanfuels.net>>.
81. Oxygenated Fuels Association. "Helping the World Clean the Air." <<http://www.ofa.net/index2.htm>>.
82. Johnson, Tom. "Whitman Acts to Cap Oxygenated Well." *Newark Star-Ledger*. 8 Feb. 1995 <<http://www.nj.com/archive/>>.
83. Johnson, Tom. "State Requires Cleaner Fuel in Winter to Meet Federal Pollution Standards." *Newark Star-Ledger*. 28 June 1992 <<http://www.nj.com/archive/>>.
84. Dressler, Bill. Personal Interview. 1 April 1996.
85. Wisconsin Department of Health and Social Services. *An Investigation of Health Concerns Attributed to Reformulated Gasoline Use in Southeast Wisconsin*. May 1995.
86. White, Mary, et. al. "Exposure to Methyl Tertiary Butyl Ether from Oxygenated Gasoline in Stamford, Connecticut." *Archives of Environmental Health*. May/June 1995: 183-189.
87. White, Mary, et. al. "Exposure to Methyl Tertiary Butyl Ether from Oxygenated Gasoline in Stamford, Connecticut." *Archives of Environmental Health*. May/June 1995: 183-189.
88. White, Mary, et. al. "Exposure to Methyl Tertiary Butyl Ether from Oxygenated Gasoline in Stamford, Connecticut." *Archives of Environmental Health*. May/June 1995: 183-189.
89. Johnson, Tom. "U.S. Urged to Limit 'Oxyfuel.'" *Newark Star-Ledger*. 24 June 1993 <<http://www.nj.com/archive/>>.
90. Johnson, Tom. "U.S. Urged to Limit 'Oxyfuel.'" *Newark Star-Ledger*. 24 June 1993 <<http://www.nj.com/archive/>>.
91. Johnson, Tom. "DEPE Presses to End Oxygenated Gas Sales." *Newark Star-Ledger*. 26 March 1994 <<http://www.nj.com/archive/>>.

92. Moore, Elizabeth. "Jersey Gas Prices Rise As Oxy-fuel 'Kicks In'." *Newark Star-Ledger*. 29 Sept. 1994 <<http://www.nj.com/archive/>>.
93. Johnson, Tom. "DEPE Presses to End Oxygenated Gas Sales." *Newark Star-Ledger*. 26 March 1994 <<http://www.nj.com/archive/>>.
94. Johnson, Tom. "Hearing on Cleaner Fuel Pumps Out Opposition to Oxygenated Effects." *Newark Star-Ledger*. 28 Oct. 1994 <<http://www.nj.com/archive/>>.
95. Johnson, Tom. "Mild Weather, Traffic Generate Unhealthy Air." *Newark Star-Ledger*. 23 Dec. 1994 <<http://www.nj.com/archive/>>.
96. Johnson, Tom. "State Seeks Cut in Controversial Gas Additive." *Newark Star-Ledger*. 1 Jan. 1995 <<http://www.nj.com/archive/>>.
97. Johnson, Tom. "State Will Seek Federal Permission to End Oxygenated Gas Sales Early." *Newark Star-Ledger*. 2 Feb. 1995 <<http://www.nj.com/archive/>>.
98. Johnson, Tom. "State Will Seek Federal Permission to End Oxygenated Gas Sales Early." *Newark Star-Ledger*. 2 Feb. 1995 <<http://www.nj.com/archive/>>.
99. Weisman, Dan. "Gas Change Stirs Frenzy in Market." *Newark Star-Ledger*. 3 Feb. 1995 <<http://www.nj.com/archive/>>.
100. Johnson, Tom. "Whitman's Oxygenated Fuel Shift Spurs N.Y., Connecticut to Reconsider." *Newark Star-Ledger*. 4 Feb. 1995 <<http://www.nj.com/archive/>>.
101. Johnson, Tom. "Whitman Acts to Cap Oxygenated Gas Well." *Newark Star-Ledger*. 8 Feb. 1995 <<http://www.nj.com/archive/>>.
102. Johnson, Tom. "Whitman Acts to Cap Oxygenated Gas Well." *Newark Star-Ledger*. 8 Feb. 1995 <<http://www.nj.com/archive/>>.
103. Johnson, Tom. "Whitman's Oxygenated Fuel Shift Spurs N.Y., Connecticut to Reconsider." *Newark Star-Ledger*. 4 Feb. 1995 <<http://www.nj.com/archive/>>.
104. Johnson, Tom. "Whitman's Oxygenated Fuel Shift Spurs N.Y., Connecticut to Reconsider." *Newark Star-Ledger*. 4 Feb. 1995 <<http://www.nj.com/archive/>>.
105. Johnson, Tom. "Whitman Acts to Cap Oxygenated Gas Well." *Newark Star-Ledger*. 8 Feb. 1995 <<http://www.nj.com/archive/>>.
106. Johnson, Tom. "Whitman Acts to Cap Oxygenated Gas Well." *Newark Star-Ledger*. 8 Feb. 1995 <<http://www.nj.com/archive/>>.

107. Johnson, Tom. "State Halts Controversial Oxygenated Fuel Program After Health Complaints." *Newark Star-Ledger*. 29 Sept. 1995 <<http://www.nj.com/archive/>>.
108. Johnson, Tom. "State Halts Controversial Oxygenated Fuel Program After Health Complaints." *Newark Star-Ledger*. 29 Sept. 1995.
109. "Press Releases." 28 Sept. 1995 <<http://www.ofa.net/index2.htm>>.
110. Johnson, Tom. "Judge Sends Jersey to Another Winter of Oxygenated Fuel." *Newark Star-Ledger*. 3 Oct. 1995 <<http://www.nj.com/archive/>>.
111. Johnson, Tom. "Judge Sends Jersey to Another Winter of Oxygenated Fuel." *Newark Star-Ledger*. 3 Oct. 1995 <<http://www.nj.com/archive/>>.
112. Johnson, Tom. "U.S. Officials Hints Jersey is Unlikely to Gain Oxygenated Gasoline Waiver." *Newark Star-Ledger*. 13 Oct. 1995 <<http://www.nj.com/archive/>>.
113. Johnson, Tom. "Ruling Exempts South Jersey from Oxyfuel Use." *Newark Star-Ledger*. 25 Oct. 1995 <<http://www.nj.com/archive/>>.
114. Associated Press. "Oxyfuel Gas Back at Pumps." *Newark Star-Ledger*. 1 Nov. 1998 <<http://www.nj.com/archive/>>.
115. Johnson, Tom. "With Air Less Foul, State Hopes to Drop Hated Fuel." *Newark Star-Ledger*. 6 Mar. 1997 <<http://www.nj.com/archive/>>.
116. Johnson, Tom. "With Air Less Foul, State Hopes to Drop Hated Fuel." *Newark Star-Ledger*. 6 Mar. 1997 <<http://www.nj.com/archive/>>.
117. Donohue, Joe. "Oxygenated Fuel in Jersey Pipeline For Another Winter." *Newark Star-Ledger* 26 Aug. 1997 <<http://www.nj.com/archive/>>.
118. Johnson, Tom. "Emissions Testing Lag May Extend Oxy-Fuel." *Newark Star-Ledger*. 1 Nov. 1997 <<http://www.nj.com/archive/>>.
119. "Oxyfuel Returns." *Newark Star-Ledger*. 20 Aug. 1998 <<http://www.nj.com/archive/>>.
120. Associated Press. "Oxyfuel Gas Back at Pumps." *Newark Star-Ledger*. 1 Nov. 1998 <<http://www.nj.com/archive/>>.