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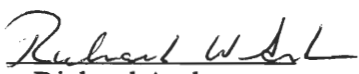
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**Asbestos Prevention In Public Schools**  
*Recommendations to AHERA Legislature*

An Interactive Qualifying Project Report  
Submitted to the Faculty of  
WORCESTER POLYTECHNIC INSTITUTE  
In a partial fulfillment of the requirements for the  
Degree of Bachelor of Science

by

  
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Approved:

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## **Abstract**

In March of 1998, the accidental discovery of asbestos in Saugus High School quickly escalated into a widespread panic. This panic only worsened when additional schools were inspected, some of which were closed for a short time, or even condemned. With an Operations and Maintenance program in place designed to control asbestos before it becomes a health risk, such a crisis was still unavoidable.

This study focuses on the asbestos crisis in Saugus. Why were these problems not detected sooner? What role did the School Department and Town Officials play in preventing this problem from occurring, or were they aware of the situation and able to legally avoid it under current legislation? What legislation governs the actions of these entities? What steps need to be taken to ensure that this problem will not arise again in the future?

## **Executive Summary**

This project arose from the public concern resulting from the discovery of asbestos in the public high school in Saugus, MA. The subsequent inspections by the Town and EPA resulted in the permanent closing of another building, an elementary school. Many reasons were cited for the closing of this building, one of which was asbestos. This served only to increase the concern of the public, and prompted this investigation to determine what may have caused these problems.

In an effort to become more familiar with the problems experienced in Saugus, interviews were conducted with both the Superintendent of Schools and the Town Manager. These interviews provided a better understanding of the problem present in Saugus. It was learned that the Operations and Maintenance program designed to deal with asbestos was under the control of the school department and was comprised of six janitors employed by the schools. This seemed odd as it was also learned that the town, in fact owned the buildings and is thus ultimately responsible for their maintenance. Additionally it was stated that tri-annual reports were conducted on each building as a method of documenting the presence of asbestos, its condition, and the desired actions to maintain it. Carrying out these desired actions can become costly and it was stated that money is often tight.

Before moving forward with the asbestos issues present in this case study, it was necessary to become intimately familiar with asbestos, its uses, health risks and regulation. A literature review was conducted in an effort to develop a history of asbestos from its early existence to its current status today as a regulated substance. A substantial portion of this literature review centered around the current guidelines

governing asbestos in schools. These guidelines are outlined in a federal register set forth by the Environmental Protection Agency under the Asbestos Hazard Emergency Response Act (AHERA). The dissection of this legislation proved vital to this study, as many of the problems experienced in Saugus could be attributed to apparent loopholes in the legislation. More generally it was believed that these perceived omissions could allow for similar outbreaks in any city or town. AHERA's federal register indeed sets forth stringent guidelines regarding the testing procedures involved when asbestos is encountered, disturbed or removed. Additionally it is this document that mandates the presence of an Operations and Maintenance programs as well as the tri-annual reports mentioned above. It appears that AHERA does fall short , however, in the area of prevention. This observation stems from the fact that AHERA does not mandate that any of the response actions present in the tri-annual reports be completed unless the situation at hand results in a substantial decrease in air quality. A final observation on AHERA's federal register is that there is no financial relief for cities and towns overburdened with asbestos problems.

In an effort to obtain support or constructive opposition to the above mentioned assumptions pertaining to the down falls of AHERA, several asbestos removal firms were contacted and asked of their opinions of the asbestos problems in schools and AHERA itself. The result of these interviews was a general concurrence with the assumptions. Some insight was provided about the absence of financial aid in the register. It was explained that AHERA authored this register knowing that money would be an issue for schools. It is for this reason that the guidelines governing the implementation of response acts, timely or otherwise, is so lenient. These interviews also brought up additional

concerns as to the training of the individuals that comprise the local Operations and Maintenance programs. One spokesperson felt that the training was not nearly as adequate as it should be.

All of the information obtained from interviews and research culminated in a strong view on asbestos in public schools. It is the feeling of the authors that the admission of the EPA that money is an issue, does not provide reason for the apparent leniency in preventative maintenance. The overriding issue present in this study is that of human health. Continuous preventative maintenance of asbestos in schools will insure that all of its occupants will be free of the substantial health risks associated with asbestos. This viewpoint provided the basis for several additions and changes made to the existing federal register. These changes were designed to protect the general health of the occupants of these schools, as well as protect the school buildings themselves from becoming condemned. In short the alterations made to AHERA's document mandate that response actions be implemented in a timely manner on a worst case first basis. It is suggested that the EPA itself perform random inspections to insure that these actions are indeed being implemented, assessing fines to those who are not complying. Additionally, the training of those involved with the Operations and Maintenance programs is to become continuous rather than inaugural. Further, state or federal funding should be available to those cities and towns facing an overbearing conflict with asbestos.

The above mentioned changes were presented to the representatives from the town of Saugus, its school department, and the asbestos companies who had previously provided information. They were asked of their thoughts on the need for such changes, their effectiveness, and their impact in practice. The general consensus was that the

changes would be sufficient to alleviate most of the problems seen in Saugus and potentially in many others cities and towns.

With the apparent support of those involved with managing asbestos in schools, it is the hope of the authors that these changes will make asbestos control a priority thus eliminating the risk to health and building alike.

## Authorship

*Richard Anderson*

Writing of background sections pertaining to the crisis in Saugus, lead contact with Saugus Town Manager, and School Superintendent.

*Kenneth Cho*

First and second interviews with Mercury Technical Services, Darling Asbestos Removal and G&K Associates Inc.

All remaining interviews, writing, and viewpoints were performed, written or arrived upon jointly by both authors.

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## **Introduction**

In the 1970s, the U.S. Environmental Protection Agency (EPA) banned the use of asbestos as a building material.<sup>1</sup> Throughout the 70's asbestos use was on the decline, as the EPA repeatedly argued as to its health risk. These arguments continued well into the 80's. It was during this time that AHERA, the current legislation designed to deal with asbestos in public schools, was drafted. Eleven years after the release of AHERA's report, asbestos still manages to cause problems in schools.

In March of 1998 while working to renovate the auditorium at the high school in Saugus MA, workers broke through a wall and uncovered asbestos. The building was immediately evacuated and a clean-up was conducted as outlined by the Environmental Protection Agency. Although not a startling discovery given the age of the building, the presence of the asbestos with its reputation as a carcinogen alarmed many. Concerned employees, students and parents swarmed around the clean-up and posed striking questions as to their general safety. In an effort to calm the fears of all those involved, town and State officials conducted asbestos and air quality tests. Unfortunately these actions served only to heighten the fears as these inspections brought on the temporary closing of three more school buildings. Public hysteria soon followed and the school department and town were indeed under fire. Several open meetings were held in an effort to calm the fears of the public. These meetings often showcased angry parents of school children lashing out at school officials regarding the health of their children. One parent, a member of an elementary school PTO, stated "This town is really in an uproar.

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<sup>1</sup> Bernarde, pg. 45.

The parents are furious.”<sup>2</sup> The situation worsened still when it was determined that one of the buildings, an elementary school, was to be condemned by the State. The closing of this building led to overcrowding in other schools as the children were relocated for the duration of the construction of a new building. As it stands currently, the elementary school stands dormant awaiting its doom. It will be bulldozed to the ground, and a new facility will replace it. The project is expected to take two years and during this interim the overcrowding of other buildings will continue, as will the question of how and why this situation was allowed to happen.

The following study will be focused on what went wrong in Saugus and how it has affected the community, particularly how the current legislation regarding asbestos control in schools allowed for such a situation to arise. Up until March 9, 1998, asbestos inspections were done every three years throughout the school system. Why were these problems not detected sooner? Or were they? If so, why were they not remedied immediately? Be it economics or politics, the outcome has caused alarm, anger, and indeed an undesirable situation for many. What role did the School Department and Town Officials play in allowing this problem to occur? What steps are now being taken to ensure that this problem will not arise in the future? Whatever the situation that allowed these buildings to come into such a state of disrepair, looking at all it has caused, was it worth it? Interviews with Town Representatives and the Superintendent of Schools were conducted in an effort to find the root of the problem and the social issues surrounding them. Additional in-depth research into the events and reports leading up to the current crisis provide the basis for the study and the resulting recommendations. This study is intended to educate those involved in this situation as to the dangers of asbestos

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<sup>2</sup> Saugus Advertiser, March 19, 1998. pg. 8.

in all its forms. More importantly, it is intended to research the potential shortcomings of current asbestos legislation and provide recommendations for their improvement.

## Methodology

Before beginning any research, a plan of action or methodology must be established. A methodology is a system of specific rules and procedures upon which research is based and against which claims of knowledge are evaluated.<sup>3</sup> A methodology is not a concrete entity, however, as it may change through the evolution of a project. Although there are many choices regarding methods by which to attack a project, it is that of a case study that most lends itself to the study at hand.

A case study or more explicitly a one-shot case study involves an observation of a single group or event at a single point in time, usually subsequent to some phenomenon that allegedly produced change.<sup>4</sup> In this instance, the single event is the asbestos crisis in the public schools of Saugus. The goal of the study is to determine the phenomenon that caused such a catastrophe to become reality. Many methods for data acquisition are present in a case study. News reports, official documents, remarks in context, personal writings, and literary works are some examples of obtaining material for a case study. Of these methods news reports, official documents, and remarks in context are all sources of information which are relatively straightforward and for the most part immune to bias in this study. Personal interviews may provide more relevant information than news reports, etc. It is important, however, to realize that the information taken from a personal interview can easily be misinterpreted. For this reason it is imperative that the researcher be familiar with the correct techniques by which to conduct a personal interview.

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<sup>3</sup> Nachmias, Chava Frankfort and David. Research Methods in the Social Sciences. St Martin's Press. NY. 1996. pg.13.

<sup>4</sup> Nachmias, pg. 146.

Through out this work several quotes and ideas obtained from personal interviews will be used to illustrate the severity of the problem and hand and provide a clear definition of the problem. The effective use of an interview as a method of data collection relies on the use of proper techniques. These techniques ensure that the information extracted from such an interview maintains its meaning and validity. The personal interview has many advantages, as well as its share of drawbacks. The interview itself provides the interviewer with some control over the material to be covered. Specific questions needed for a complete understanding of the subjects' involvement in a particular situation are essential. Subsequent elaboration by the subject allows the interviewer to obtain a feel for the subjects' personal feeling on a situation as well. In the same arena, the flow of an interview and the spontaneous responses of the subject can influence the direction of further study. The main downfall to personal interviewing is that of interviewer bias. The very control that a personal interview provides the interviewer can allow for coercion of the subject. Additionally the interpretation of statements or reactions of a subject by the interviewer may be altered as a result of a predisposition. These downfalls can indeed decrease both the validity and effectiveness of an interview. To this end, it is important to be certain that all interviews are objective, that all responses are captured in text, and that all information is accurately portrayed regardless of its compliance with the beliefs of the interviewer. Using the above-mentioned techniques much information was gathered on the crisis in Saugus.

In this study an in-depth literature review was conducted to become familiar with asbestos, its past and its existence today. Due to the apparent popularity of asbestos, its use and its affect on health, the needed background could be obtained from an abundance

of books on the subject. With a basic background on asbestos as a material and health hazard, the EPA's "Asbestos Containing Materials in Schools: Final Rule and Notice," written under AHERA, was studied to gain an understanding of the legislation that governs asbestos in public schools. In conjunction with the study of AHERA's final rule, two sets of tri-annual asbestos reports (required under AHERA) from Saugus were studied in detail. These reports provided insight into the method by which they were both written and utilized. Personal interviews were conducted with William P. Doyle, superintendent of schools, and Steven Angelo, Town Manager, in an effort to ascertain what caused the asbestos crisis in Saugus. These interviews were supplemented with numerous newspaper articles on the subject to obtain a complete knowledge of the crisis from all angles. It became apparent that there were several factors which played a role in the crisis because of loopholes in the AHERA final rule.

A further examination of AHERA's final rule led to several suggestions for changes that may have prevented the crisis in Saugus from occurring. Personal interviews were conducted with several asbestos removal companies. In these interviews, representatives from each company were asked for their opinions, from experience, on general improvements that could be made to the methods by which asbestos was controlled and maintained in public schools. These opinions, coupled with the dissection of AHERA's final rule, provided the basis for the recommended changes to the legislation.

Once these changes were formulated, all parties previously interviewed, including Doyle, Angelo and the asbestos removal firms, were all contacted again and asked of

their opinions on the suggested changes. Their opinions provided further insight into the practical effects of the changes and lead to their refinement.

## Background

### History Of Asbestos

Asbestos is a naturally occurring fibrous material. It is formed by crushing and processing hydrated silicates into long flexible fibers.<sup>5</sup> These brittle looking fibers are in fact quite strong with a tensile strength comparable to that of piano wire.<sup>6</sup> Asbestos is rarely used by itself and is generally combined with cement, vinyl or plaster to form a strong matrix. It can also be spun into yarn, woven into fabric and braided into rope.<sup>7</sup> By nature, asbestos is extremely resistant to heat which lends it to widespread use as an insulant. Asbestos is also extremely resistant to corrosion, another property that makes it an attractive material for any application.

The use of asbestos has roots dating back to 2500 B.C when it was used in pottery found in Finland.<sup>8</sup> Throughout history, asbestos has been used for many applications from candle wicks and clothes to ropes and surgical stitching.<sup>9</sup> Its use grew rapidly as more applications for the fiber arose. This growth is clear as the use of asbestos in paints, asphalts, plastics, cements, filters, floor tiles, etc. was evident through the 1970's.

Almost from its inception, asbestos' toll on human health has been questioned. In as early as the 1<sup>st</sup> century A.D there were concerns as to the health of those individuals in contact with asbestos, such as those who mined the substance.<sup>10</sup> The first medically substantiated warnings in the US came in the 1930s.<sup>11</sup> Over the next 40 years or so, more warnings and thus more questions as to the risk of asbestos arose. Within this time, much

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<sup>5</sup> Benarde, Melvin A. Asbestos: The Hazardous Fiber. 1990 CRC Press, Florida. pg. 2.

<sup>6</sup> Brodeur, Paul. The Asbestos Hazard. 1980 The New York Academy of Sciences, NY.

<sup>7</sup> Benarde, pg 3.

<sup>8</sup> Selikoff, Irving J., Lee Douglas, H. K. Asbestos and Disease. New York: Academic Press, 1978, pg. 3.

<sup>9</sup> Selikoff, pg. 4-7.

<sup>10</sup> Selikoff, pg. 20.



research involving asbestos and its effects on the body was conducted. Currently the United States appear to be the leader in recognizing the dangers of asbestos. In Japan for instance they are only now beginning to question the adverse effects of asbestos on the health of those who come in contact with it.

Throughout the period from 1930 to 1970, several studies in the US dealt with how asbestos enters the body and how the body reacts to its presence. Although asbestos can enter the body through direct contact with fibers, it seems that the overwhelming majority of literature and research point to airborne asbestos fibers resulting from aging or disturbed asbestos as being the largest threat to human health. Because of their tiny size asbestos fibers can become airborne, and are easily inhaled and swallowed. Once in the body the fibers become lodged in the tissue of the lungs and respiratory tract. Due to the durability of these fibers, a main reason why they were used so extensively, they remain in the body essentially for a lifetime. Migrating from the lungs, these fibers can cause disease in other parts of the body. Unfortunately there are no early warning signs to asbestos exposure, as for most asbestos related diseases, the incubation period is anywhere from 15 –35 years.<sup>12</sup>

The term asbestosis soon became the title that now encompasses many asbestos related illnesses. By definition, asbestosis is a chronic disease characterized by scarring of the lungs as a result of inhalation and retention of asbestos fibers. Asbestosis is deadly, usually causing heart failure or eventually leading to cancer.<sup>13</sup>

As a result of this and other findings through research, the concerns for asbestos as a severe health risk took a sharp turn upward when in the 1970s, the U.S.

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<sup>11</sup> Selikoff, pg. 22.

<sup>12</sup> Brodeur, pg. 8.

Environmental Protection Agency (EPA) banned the use of asbestos as a building material.<sup>14</sup> Throughout the 70's asbestos use was on the decline, as the EPA repeatedly argued as to its health risk. These arguments continued well into the 80's. It was during this time that AHERA, the current legislation designed to deal with asbestos in public schools, was drafted.

### AHERA

In 1986 the Asbestos Hazard Emergency Response Act (AHERA) arose from the belief that any amount of asbestos is a hazard, and mandates its assessment and control in schools.<sup>15</sup> This committee released a report in 1987, outlining strict and often excruciatingly detailed guidelines for the assessment of asbestos in, and when necessary the removal of asbestos, from all public schools.

In its report of findings, AHERA begins by defining areas of schools buildings subject to asbestos testing as well as different terminology of asbestos-containing building material (ACBM): “asbestos debris, damaged or significantly damaged thermal system insulation ACM, damaged friable surfacing ACM, and significantly damaged friable surfacing ACM. Asbestos debris may consist of small pieces of insulation, or plaster containing asbestos fibers. Thermal system insulation consists of pipe and fitting wrapping used on steam pipes. Friable asbestos is any asbestos that has the ability to release harmful fibers into the air if disturbed.

To structure a method to keep asbestos in check, AHERA defines duties of local education agencies (LEAs). LEAs are responsible for inspections, surveillance, and

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<sup>13</sup> Brodeur, pg. 9.

<sup>14</sup> Bernarde, pg. 45.

response actions for ACM, training custodial and maintenance employees, informing occupants and short-term workers of O&M activities, posting warning labels, and making management plans available to parents, teachers and employee organizations. Accredited inspectors must identify and catalog all suspected ACBM in the school as well as take samples for analysis. These reports are performed tri-annually or upon request and are presented to the school department. In addition to providing for a maintenance plan and reviewing asbestos reports, the LEAs are also responsible for ensuring that its maintenance and custodial staff receive at least 2 hours of asbestos awareness training. Staffs who are prone to disturbing ACBM must receive an additional 14 hours of training. Periodic surveillance on ACBM must also be performed and recorded at least every 6 months by accredited personnel. AHERA also describes penalties and fines enacted for LEAs that do not adhere to the final rule. This penalty is enacted when an LEA fails to conduct inspections in a manner consistent with the regulations described above. Additionally, if false information is provided in any reports, or if a management plan is not developed, a penalty will result. The civil penalty for any of these infractions is a fine of up to \$5000 per day.

In addition to setting forth guidelines for LEAs, their training and responsibilities, this report also provides a summary of laboratory data quality objectives. Essentially this consists of a set of extremely stringent rules that apply to the laboratories, their equipment and personnel, regarding the testing of samples for asbestos content. AHERA also outlines extremely stringent rules with regard to on-site collection, packaging and shipment of asbestos containing samples. Many procedures exist for the collection of samples as well as the calibration and decontamination of the equipment used in the

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<sup>15</sup> Bernarde, pg. 49.

collection process. In addition, specific instruction as to the shipment of the samples are outlined. Samples are to be completely sealed before shipping, and shipped in rigid containers to avoid a health hazard. These rules also dictate that any sampling must be done by qualified persons other than the abatement contractor.

The report also discusses testing methods, and characterization procedures for asbestos. Accepted testing methods involving transmission electron microscopes are presented, with graphics of known asbestos structures for uniform classification. The alignment and calibration of the said microscope, as well as the process by which samples are prepared, analyzed, and classified are also outlined. Reports on asbestos content are to include the concentration of asbestos fibers, the number of fibers present, official count sheets tallying the number of known asbestos structure present, and the signature of a laboratory official to indicate that the laboratory met AHERA standards.

The interpretation of the results of these asbestos tests is critical. AHERA provides guidelines for interpreting the results of testing. This ensures that any abatement process was successful in reducing or eliminating the risk posed by the presence of asbestos. AHERA discusses “small scale short duration operations maintenance and repair activities involving asbestos”. This section of the report provides instructions for removal of small amounts of asbestos, such as small sections of drywall, pipe insulation or asbestos gaskets commonly found in school buildings. Removal methods recommended by OSHA including wet and glove bag methods for the preparation of an area for removal of small amounts of asbestos are outlined.

The EPA has established a record for this rulemaking and it is available in the Office of Toxic Substances Public Information Office. The record includes information

considered by the EPA in developing the proposed and final rules, which include: (1) Federal Register notices, (2) Support documents, (3) Reports, (4) Memoranda and letters, (5) Records of the negotiating committee, (6) Public comments received on the proposed rule, (7) Response to comments document, (8) Transcript of the August 25 and 26 Public Meeting.

In general, AHERA's federal register sets forth stringent guidelines regarding the testing procedures involved when asbestos is encountered, disturbed or removed. Additionally this document mandates the presence of Operations and Maintenance programs as well as the tri-annual reports mentioned above. AHERA does not mandate that any of the response actions present in the tri-annual reports be completed unless the situation results in a substantial decrease in air quality.

After the release of the findings of AHERA, asbestos again became a hot topic because many of the current school buildings were constructed during the time when asbestos was one of the most popular materials for pipe and boiler insulation as well as flooring tiles in many of these school buildings.

#### Crisis in Saugus

Recently, in Saugus MA, the problem of asbestos present in public school buildings became a major issue when it was uncovered in Saugus High School. This discovery furnished a renewed public concern and hysteria over the presence of the now well-known carcinogen in the schools.

In an interview with Mr. William P. Doyle, Superintendent of Saugus Public Schools, much was revealed about the problem of asbestos in the towns' schools. Details

of the history of the asbestos problem leading up to the recent upheaval caused by the permanent closing of one building were discussed as well as plans to keep this problem from recurring, the latter appearing to be somewhat overlooked.

When asked about the current problems with asbestos and air quality in the public schools of Saugus, Doyle opened his remarks with the statement “March 9, 1998.” This was indeed the date when all of the underlying fears of asbestos in schools came to a head with the discovery of asbestos in the high school during renovation of the auditorium there. He went on to explain the procedures that were followed, including the immediate evacuation of the building, notification of the state and a prompt clean up by a certified environmental company. This discovery heightened the fears of parents and teachers alike and all buildings were immediately tested. Unfortunately, several other schools became suspect and were rigorously tested for asbestos as well as other airborne contaminants. When testing of all the schools was finished, the Veteran’s Memorial School was shut down indefinitely. We inquired about this situation, and according to Doyle, the Veterans Memorial School was completely shut down due to a number of problems including high mold counts, windows and roof in need of intense repair and more relevant to this study, the presence of asbestos. According to Doyle, the asbestos problem itself would cost \$267,000 to remedy. As a result of the compounded problems present in the building, the Veterans School will be demolished and a new building will be built on the same site. Unfortunately, the asbestos will still have to be removed before the demolition can begin. Doyle also stated that in order to completely repair the building, including the removal of asbestos, the total cost would be between 4 and 5 million dollars. He stressed that the asbestos was only a small part of the problem. This

is difficult to believe, as there had been no prior mention of any plans to renovate before its closing. The town has opted to forego repairs on the old building and plans to construct a new building, the cost of which is estimated at \$11.2 million. This decision, Doyle stated, was a direct result of the fact that the state will pay for 67% of a new building and supply no funds for the repair of an old building. This decision represents savings of roughly \$1 million for the Town. With the savings included, this project will still cost the Town of Saugus an estimated \$3.73 million. It seems that it would be far more economically sound to maintain the current buildings, than to build new ones when years of disrepair result in insurmountable or unjustifiable repair costs. When asked what precautionary measures were being taken with respect to asbestos in the schools in light of the role it played in the closing of the Veterans School, and indeed its presence in several other buildings, Doyle disclosed that Saugus now conducts air quality tests every year to ensure that the levels of asbestos are in check. He also stated, but would not elaborate on the fact that two other schools currently have a “potential for a problem.” When asked what was being done to remedy this “potential problem,” Doyle stated that neither he nor the EPA felt that the situations warranted any immediate action and that they would be watched closely. In an aside, away from the condition of the buildings, Doyle cited a recent case where a teacher of 20 years had been diagnosed as having the early stages of asbestosis, a disease of the lungs caused by asbestos, but was quick to state that the buildings which had been tested prior to the current school year were retested and again showed no dangerous amounts of asbestos. He went on to explain the process through which this teacher had his/her own doctor’s diagnosis be supported by another specialist of the towns’ choosing. He also alluded to the teacher’s past. She

apparently lived near a shipyard, a place where asbestos use is known to be rampant. Research claims that asbestosis takes 15–20 years to develop from the initial exposure. The school department seems to be taking no chances as they are providing the teacher with a specialist of her choice to be paid for by the town. Seemingly with all that has gone on, we would expect much effort to be put forth in preventing this problem from occurring and gathering momentum as it has over the past year and a half. We were surprised to discover that the only new precautionary measure was to test the schools more frequently. The only time a repair is performed on a building is when a building fails a test, or according to Doyle “it passes, but the readings are too close for comfort.” When asked if this approach seemed to be more of the “band-aid” variety and less along the lines of prevention, Doyle seemingly agreed. He stated that only a small number of voters in the town (18%) had children of school age, and as a result, the town doesn’t appropriate enough money for such prevention or as he said “general maintenance of all the buildings involved.” Elaborating on the role of the Town itself in the problem, Doyle stated that although the Town owns the buildings, it has become the School Departments’ responsibility to maintain them.

Turning toward the town and its role in the crisis, Town Manager Steven V. Angelo provided tremendous insight on the financial aspects of the management of the town including the maintenance of its buildings. When asked if the town owned the buildings, Angelo stated that the Town does in fact own the school buildings, and that he, the Town Manager, is responsible for the maintenance of the buildings. This is contradictory to the above-mentioned statements of Superintendent Doyle. Although this would intuitively be the correct way for things to be handled, the fact that the town does



assume this responsibility raised some other questions. If the town is responsible, why are the asbestos reports presented only to the school department? The answer may be simple: the Operations and Maintenance program consists of 6 janitors who are employed by the school department. It is these individuals who are responsible for interpreting the reports and determining which areas require action under the guidelines of AHERA. The town is therefore left in the dark unless a problem is reported to them by the school department. Although Angelo could not speculate on whether past town managers had ever seen these reports, he did state that to date he had not. According to Angelo, it is the hope of the town manager that any and all serious problems would be relayed to the town immediately.

Angelo stated that the town is taking steps to establish more control over the maintenance of the buildings. This includes establishing a team of contracted town employees to visually inspect the buildings on a continuous basis. Angelo claims that the janitorial staff only cleans the building, they do not provide maintenance. To support this statement, Angelo cites an example where a fan was burned out and caused a missed day of school because it was undetected. He felt that if the janitorial staff had inspected and reported this problem, it could have been fixed and there would be no lost school time. Missing a day of school is costly with salaries etc. Angelo agrees that it is wiser to take care of problems before they occur. He stated that it would be better to eliminate these problems than to deal with them down the road when they are more costly and have associated potential lawsuits. An example of such a lawsuit where a teacher had become ill was mentioned by Superintendent Doyle and appears earlier in this work. As was stated the Town is planning to step up its involvement with the schools. Angelo

cautioned that although the intentions are the best, funding is always a problem. From a political standpoint he posed the question of whether it is wise to inform the townspeople of all the problems, knowing that he currently does not have the means to fix them.

Additionally, a snag was noted in the building of the new school to replace the above-mentioned Veterans School. The town does not have the funding even to pick up its portion of the bill (\$3.73 million). It is currently working for a proposition 2 ½ override to allow for an increase in tax dollars to fund the school.

With a clear sense of the structure, or lack thereof, the town and school departments methods for dealing with asbestos, the tri annual reports were investigated. These reports proved to provide first hand information on the current condition of all the school buildings as well as a history of preventative maintenance.

The first reports on the presence of asbestos in the Public School Buildings were performed in 1988 in accordance with the findings and recommendations of AHERA in 1987. These initial reports were unavailable due to the fact that only current reports are required to be kept on file. The subsequent reports up to the present day were available, and were obtained for all buildings in the Saugus Public School system. The findings in the most recent reports of 1996 were compared to those of the 1992 reports for each building to determine the relative activity of the past three year s related to asbestos removal and maintenance. These reports were performed by the same company, Tundra Air Consultants, formally Covino Environmental Consultants. Each report outlines the AHERA requirements that these tri-annual re-inspections are to fulfill. Under AHERA regulations, these inspections are performed to reinspect and assess the condition of known or assumed friable Asbestos Containing Building Materials (ACBM). In addition,

visual inspection on materials that was previously determined to be non-friable is done to see if its condition has worsened. Identifying new areas where friable material has become evident, collecting bulk samples of such material and providing an assessment of the newly friable material are also part of these inspections. Each report also outlines in detail the location and condition of all friable, or potentially friable, ACM present in each building. Each area of the building is assigned a number for record keeping. This allows for undisputed comparison of the reports from inspection to inspection.

In total reports from all nine buildings in the Saugus school system were analyzed to determine the asbestos removal and control from 1992–1996. The common thread through most of these reports is simple. Most of the buildings in the school system have had little or no work done to repair or remove asbestos that has been reported to have been detected. A few buildings had scattered minor repairs such as replacing lights, fixtures or missing floor tiles, while only one had any major asbestos abatement. Often times the presence of asbestos reported in 1992 and the recommendations on how to repair/remove it were simply paraphrased in the reports of 1996. Summaries of the reports of 1992, and 1996 for each building are shown in Appendix A.

## Discussion

The fact that no work had been done in most of the school buildings during these three years is somewhat unsettling. The reports are designed to aid in the management of asbestos for the safety of all involved. Those who author the reports stand by their assessments and recommendations. In 1997, an independent contractor who was the chairman of a building committee in the town authored reports on the now condemned Veterans school building. In this report, the committee states that “suspected asbestos containing material was found on an abandoned boiler, and heating pipes in the crawl space of the school. Following the closing of the Veterans School by the state this same contractor was asked about the report of 1997, he said “I wouldn’t have reported it if I didn’t think it should be cleaned up.<sup>16</sup>” Although he was quick to add that he didn’t think it jeopardized the health of the children, it is his first comment that raises an eyebrow. In response to the resurfacing of this report, and the comments made by its co-author, one member of the School’s PTO summed up the general concern of most people in the town with this statement: “People want to know why 13 months later (after the issuing of the report) they haven’t done anything.<sup>17</sup>”

The paraphrasing apparent in most of the reports, and comments from the likes of people who author such reports, leads to the question of why nothing was done. The answer to this question may have several factors, but the underlying cause may be in the very guidelines set forth by AHERA that were designed to control asbestos.

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<sup>16</sup> Olivieri, Stephen, and Robert W. Paquette. “Parents say they need more complete answers.” The Saugus Advertiser, 19 March, 1998, pg. 1.

<sup>17</sup> Olivieri, Stephen. “Year old report cites potential asbestos problems.” The Saugus Advertiser, 19 March, 1998, pg. 1.

Although the report does outline plans for keeping Operations and Maintenance programs in place, and provides stringent guidelines for removal of asbestos, one major intermediate step is missing. Nowhere in the report does it state any guidelines for preventative maintenance. It is apparently the decision of the local Operations & Management program manager when asbestos removal is required and to what scale it is needed provided no air quality test has been failed.

The federal register set forth by AHERA does not specify when cleanup or asbestos removal is needed. It specifies how the testing is to be done, requires continuous reporting of the problem to keep it in check, but does not specify when clean up should commence. Only in extreme cases when tests are failed is the EPA notified, and do they take action. Essentially, the School Department in Saugus is complying 100% with the rules set forth by AHERA. Unfortunately, this gray area in AHERA guidelines allows for asbestos removal and even maintenance to be neglected until absolutely necessary. The tri-annual reports are required by AHERA, but they are never sequestered by the EPA. They are simply tools for evaluation that local Operations & Management programs use to decide if cleanup is needed. If for instance there are several asbestos problems in a building, they would be reported in the tri annual reports, which are presented only to the school department. The O&M program, a division of the school department, provided that no air tests have been failed, decide whether or not to perform any asbestos clean up. Now if they choose to do nothing, they are still complying with AHERA. This action however could allow many areas of a building to slowly creep up to the dangerous level. If this were to happen, the problem may become so severe that the EPA will step in, after learning of failed tests, and order the building

closed until the asbestos is completely cleaned up. Why wait for this to occur?? Why risk having a building closed, or worse, condemned as a result of lack of preventative maintenance as a result of a loop hole in regulation? It appears that this band aid method of repairing and maintaining asbestos is constantly flirting with disaster. The likes of which came to a head in Saugus in 1998. In hindsight the events of March, 1998 and all that followed were not necessarily the fault of the school department or the town.

Although prevention should always be a standing policy in the school department, it is the omission of regulations regarding preventative maintenance from AHERA guidelines that are to blame.

Another aspect of the crisis in Saugus that improved legislation could alleviate is that of finance. Although unfortunate, it is true that money makes the world go around. Any organization be it federal, state or local needs money to support itself. For example, a town has an annual budget in which it states how much revenue was received in the prior fiscal year as well as what spending will take place in the next. Often times special projects are present in the budget and as often is the case unexpected costs cause strains on the budget. Most often budgets are written with some degree of safety, that is to say there exists a stash of money “for a rainy day.” Unfortunately even with the “rainy day” funds many other towns often find themselves strapped for cash. When this situation occurs there is a scramble to be certain that those projects that are “visible” are given the funds they require while other “hidden” entities are left hanging until some money frees up. Generally speaking those projects with political ramifications top the list of “visible” projects. As a result, it is often the case that general maintenance of buildings, recreation areas, and other such facilities are neglected, as they fall under the title of “hidden” areas.

The town examined in this study provides a good example of how these financial strains can adversely affect a town.

Over the past few years there have been several new buildings constructed throughout Saugus, as well as complete renovations of some of the older existing buildings. A new Police/Fire station, Senior Center, Library and DPW headquarters have all been constructed within the last three years. In addition a complete renovation of the existing town hall was conducted. With most of the voting public concerned for their safety and the “visible” appearance of the town, it is no surprise that the Police/Fire station and the DPW headquarters were high on the list of “visible projects”.

Additionally the demographics of Saugus make it a town geared toward the elderly who, in fact make up the majority of the voting population. This in mind it seems logical that a new Senior Center would be built, irregardless of the fact there already existed a capable facility in town. The library itself was an obvious choice as the existing one could no longer handle the volume of information it had amassed. The renovation of the town hall created needed office space while restoring a historical building. With several major projects running simultaneously, one must assume that there were more than one instance where money was indeed tight. Ironically it is over this same time period that the Public Schools, and in particular the maintenance thereof, became subject to disaster.

As has been stated earlier the tri annual reports investigated from 1992 and 1996 showed only minimal significant action taken with regards to asbestos, a maintenance related problem. It is apparent that this trend continued throughout 1997 and 1998 as it was in March of 1998 that asbestos became a major issue in Saugus. Additionally it was this asbestos “crisis” coupled with high mold counts and leaking windows (all

maintenance related) that caused the Veterans School to be condemned. This crisis has now caused an otherwise “hidden” entity to become an extremely “visible” problem. This upgrade in status from hidden to visible seemingly would deem this project as one of the more important. That may be the case, but currently with all the other major projects (some still in progress) the funds for the planned demolition and reconstruction of the Veterans School are nonexistent. As a result of this lack of funds, Town Manager Angelo has come to the decision that a Proposition 2 ½ override vote is the only means by which a new school can be built.

Proposition 2 ½ simply stated is a law that provides that a tax increase for any given year can not exceed a level 2 ½ percent above the previous year. It is the feeling of the Town Manager that the only way to obtain Saugus’ contribution to the new school building, nearly \$4 million, is to increase the taxes by more than 2 ½ percent. For the people of Saugus this translates into an tax increase of approximately \$22.50 per household per year for the next 20 years. Although this is not a staggering amount of money it is an amount that the Town Manager is concerned that most residents in the demographically top-heavy Saugus will not be willing to pay. Unfortunately, the decision as to whether this tax hike will be allowed lies in the hands of those who will be taxed. The majority of voting citizens in Saugus is the senior citizens, those who are most inclined to favor lower taxes over funding a new school. One would hope that the choice is obvious and that education is a priority in such a community. There are many who seemingly agree with this philosophy, as there are also many who disagree. It seems that this political game of robbing Peter to pay Paul coupled with the collective attitude of voters will be what dictates the literal rise and fall of the school in question.



The timing of this study allows for the results of the above mentioned override to be reported. In a town of slightly more than 26,000 people a mere 3,216 voted on the override, or debt exclusion as it is now called. The unofficial results reported in the local newspaper show that 1833 voted for, and 1383 voted against the override.<sup>18</sup> The vote now moves on to the town meeting where a 2/3 vote of all members is needed for the debt exclusion override to take effect. This vote will take place after the closing of this study. In this instance, it appears that the money needed for the school will become available. For a time, however, the plans for a new building and the education it would provide were indeed in jeopardy.

This example in mind, and recalling the dangers of asbestos, it seems that the current legislation must do more to ensure sufficient maintenance of asbestos in public schools. Knowing the risks to health that asbestos invokes it is more than an issue of appearance it is one of life or eventual death. As was mentioned previously, more stringent legislation must be in place to ensure that asbestos maintenance in public schools cannot be ignored. These new guidelines would help eliminate the possibility of asbestos contributing to such disasters as the one currently pending in Saugus.

In an effort to obtain additional support and ideas pertaining to improvements to AHERA, several asbestos removal firms were contacted. These firms deal directly with the LEA's mentioned earlier as well as with the guidelines set forth by AHERA. This direct interaction with all those involved in regulation of asbestos in schools make these firms a viable resource when gaining insight on possible changes to regulation.

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<sup>18</sup> Deely, Kathleen. "Voters pass override for school." The Saugus Advertiser, 8 April, 1999, pg.1.

The interviews with these asbestos companies yielded some useful comments and suggestions. Kathy Sullivan, staff member at Mercury Technical Services, commented that the main problem that most towns and companies face is that of money. Due to the fact that removing asbestos is extremely costly, most resort to repairing and concealing the asbestos fiber rather than completely removing it from the site. When asked about asbestos in schools, she felt that asbestos should be removed. Additionally, she felt that a deadline should be set for the removal of asbestos for all buildings.

Some different ideas as to the main problem surrounding asbestos in schools were offered by Ginny Nichols, office manager at Darling Asbestos Removal. Ms. Nichols suggests that it is lack of on-site maintenance that is the source of most asbestos problems. Custodians in charge of the asbestos maintenance in schools are often unaware of the potentially dangerous conditions of their schools. She proposes that training of O&M personnel should be stricter so that they are more prone to spot problem areas before they further deteriorate. Ms. Nichols also proposes that “policing” of this system would be helpful. If the custodians of the schools are not properly trained and equipped to deal with asbestos, the school should be issued fines for not ensuring the safety of the occupants of the building. She offers a differing opinion than that of Ms. Sullivan above. Ms. Nichols is firm in saying that asbestos in good condition should be left alone. To remove asbestos, even in bad condition, is a costly and laborious procedure. If the ACM is not prone to releasing fibers into the air, it should be sealed and untouched. The President of another asbestos abatement company, G&K Associates, concurs with this opinion.

While agreeing with the standpoint that asbestos should not be removed unless necessary, G&K Associates offered some contradicting opinions, as compared to the other companies surveyed, on the effectiveness of AHERA. They feel that AHERA is already effective at keeping occupants safe from asbestos in public schools.

The above arguments provide a feel for the diversity of the opinions on asbestos, its removal and the federal regulations that are associated with it. With these comments and all that has been learned from the case in Saugus, intelligent comments and recommendations can now be made for improvements in legislation, as well as the general approach to asbestos maintenance.

## Conclusions

Saugus provided an excellent case study of the problems present in the current legislation governing asbestos in public schools. Many if not all of the catalysts that allowed the crisis to arise in Saugus could have been avoided with tougher legislation. It was discovered that through the three years between consecutive tri-annual reports, little if any repairs were made to the aging asbestos in the schools. Although these reports outlined response actions, AHERA's federal register did not mandate that they be completed. Additionally, the infrastructure in Saugus allowed for the tri-annual reports themselves to be sent to the schools, an entity not ultimately responsible for the maintenance of the buildings. Again AHERA's ruling does not address this issue. These shortcomings in AHERA in mind, some answers to the main question posed at the outset of this study, focusing on what steps need to be taken to ensure that this problem will not arise again in the future, can be obtained.

Given the severity of the health risk present with asbestos it is clear that this type of crisis is one that must be avoided in the future. Observations as to what went wrong in Saugus provide insight into the problems present in the current system of asbestos management in schools. Certainly not an isolated incident, the crisis in Saugus should be seen not as an ordeal to be swept beneath a political rug, but as an example of the need for modifications to the current legislation.

It is clear from the above case study that AHERA falls short in some key areas. It is imperative that the legislation change its focus from disaster relief to disaster prevention. The only way to truly eliminate the threat of asbestos is to remove the asbestos. Knowing that this is not always feasible or safe, preventative maintenance must

be strictly enforced. Legislation should require that asbestos maintenance be handled on a worst case first basis. That is to say those areas which are on the verge of becoming a problem should be remedied first. It should go further to provide for the continued maintenance of lower risk asbestos in a timely cost effective manner. The legislation should also mandate continuous training with periodic re-certification for all members of the Operations and Maintenance programs. By mandating such actions and training, the EPA will force the Operations and Maintenance programs to become much more assertive, effective and indeed more of a priority. In addition to these important changes, the EPA must also dictate that the tri-annual reports are presented to the governing body in the owners of the property in question, not its occupants. It is the responsibility of a property owner to ensure the safety of the buildings for its occupants, not vice versa.

Another aspect of the EPA's legislation involving asbestos is that of money. As can be seen in the case of Saugus the lack of funding indeed inhibits the upkeep of the buildings in question. Although "lack of funds" is often a political scapegoat for mismanagement, government funding with total involvement of the EPA would prove to be useful. The total involvement of the EPA would include a strict set of guidelines regarding the documentation of the use of any government funding in asbestos maintenance. With random inspections, the EPA can ensure that the above-mentioned documentation is accurate.

As has been mentioned Saugus is not the only town or city battling asbestos. With new programs in place regarding the overall maintenance of the buildings in question, it is hoped that this crisis is indeed over. More town control seems to hold

promise for preventing future crisis. The additional support of the EPA through changes in legislation outlined below would certainly be welcomed and prove rewarding.

Although successful in pinpointing some inadequacies in the current legislation, this study proved to have some limitations. Some of the ideas for changes suggested above resulted from observation, and not from research. Mandating that government funding be available as well as continuous training and re-certification of members of O & M programs seem like logical improvements. The logistics necessary to make these changes a reality are beyond the scope of this study.

#### Recommendations for alterations to AHERA

The basic content of AHERA's Final Rule and Notice pertaining to asbestos in schools was summarized earlier in this report. Through the careful summarization of this final notice, and with all the information gathered through personal interviews and research, it is suggested that several additions be made to the federal register. These additions will leave fewer loopholes, providing for a decreased ability for a crisis such as that seen in Saugus to arise.

The following sections are paraphrased from the said final rule with the recommended additions appearing [**bolded in brackets**]. Those areas that should be omitted in lieu of the new additions are shown in gray.

The change in the following section is designed to ensure that the party ultimately responsible for the maintenance of the building is properly informed of the condition of said building at all times. Additionally the EPA should be informed of the condition of these buildings at all times for purposes of monitoring the management of ACBM.

**Section II, subheading D. “Inspections and Reinspections”, Section 3, paragraph 1:**

*Reinspections.* Section 763.85(b) requires LEA's to have accredited inspectors conduct reinspections at least once every 3 years. The inspector must reinspect all known or assumed ACBM and shall determine by touching whether nonfriable material has become friable since the last inspection. The inspector may sample any newly friable materials or continue to assume that the material to be ACM. The inspector shall record changes in the material's conditions, sample locations, and the inspection date for inclusion in the management plan. In addition the inspector must assess newly friable known or assumed ACBM, reassess the condition of friable known or assumed ACBM and include assessment and reassessment information in the management plan. **[Reports of these assessments with response actions shall be forwarded to legal owners of the property in which the ACBM is located and the LEA's for execution of recommended response actions. These reports must also be filed with the EPA for the purposes of random progress inspections.]**

The change in the following section is again designed to ensure that the party ultimately responsible for the maintenance of the building is properly informed of the condition of said building at all times.

**In section II, subheading G. “Management Plans”, paragraph 2:**

Each LEA is required to maintain a copy of the management plan in its administrative office and each school is required to maintain a copy of the school's management plan in the school's administrative office. **[A copy of this management plan is to be forwarded to the legal owner of the building in which the management plan is instituted.]**

The change in the following section is designed to impose a finite time period in which progress must be made in reducing the health risk of all asbestos present in schools.

**In section II subheading H. "Response Actions", paragraph 2:**

The LEA is required to **select and implement in a timely manner [ period of no longer than 3 years,]** the appropriate response actions **[as recommended by an accredited inspection company, in as many areas as possible on worst case first basis.]** The response action[s] shall be sufficient to protect human health and the environment. From among the response actions that protect human health and the environment the LEA may select **the response action that is least burdensome. [a different response action of the five outlined by AHERA, provided that it too completely eliminates the threat posed to human health and the environment. ]**

The change in the following section is designed to ensure that all parties involved in the day to day maintenance of ACBM are properly trained. Ensuring that these people



are properly trained ensures their safety in working with ACBM and provides piece of mind that the decisions they make are sound.

**In section II subheading I. “Training and Periodic Surveillance”, paragraph 1:**

The LEA shall insure that all members of its maintenance and custodial staff receive at least 2 hours of awareness training. The LEA must also insure that staff who conduct any activities which will disturb ACBM receive an additional 14 hours of training. Specific topics to be covered in the 2-hour and 14 hour training courses are listed in section 763.92(a) **[All members of the maintenance and custodial staff must be re-certified once every 3 years in conjunction with assessments of ACBM.]**

The changes in the following section are designed to prevent the maintenance of asbestos from becoming a hidden entity. In other words, these fines are imposed to ensure that the maintenance of ACBM in schools becomes a priority.

**In section II subheading O. “Enforcement”, paragraph 1:**

TSCA Title II section 207(a) provides civil penalties of up to \$5,000 per day for violations of Title II of TSCA when an LEA fails to conduct inspections in a manner consistent with the final rule, knowingly submits false information to the Governor, or fails to develop a management plan in a manner consistent with this

rule. **[Such fines will also be imposed if at any time it is deemed that insufficient progress (based on severity of presence of ACBM) has been made in executing response actions agreed upon by the LEA and an accredited inspection company.]** TSCA Title II. Section 16 provides civil penalties of up to \$25,000 per day for violations of title I of TSCA when a person other than an LEA violates the final rule. Criminal penalties may be assessed if any violation committed by any person (including a LEA) is knowing or willful.

In addition to the above mentioned modifications to the final rule, a new subheading to section II should be added dealing with the availability of federal subsidization for removal and maintenance of asbestos. The suggested section addition appears below.

**Section II subheading Q. “Federal Funds Availability” would read:**

If as a result of tri annual assessments of the presence of ACBM it becomes necessary to perform involved removal, cleanup or encapsulation of such an amount of ACBM that school and local budgets become insufficient, federal funding may become available. A written statement submitted to the EPA describing in detail the overbearing problem with ACBM as well as the plans for the worst case first progressive cleanup (sec II:H:2) will begin the process by which federal funding may become available. Within 30 days of the receiving such a request the EPA will make an assessment as to the health risk associated

with the situation. This assessment will dictate the amount of federal funding to be provided. Once federal funding is either provided or denied, the above stated time limits and fines will be in effect.

A system of checks and balances coupled with the above mentioned changes in AHERAs guidelines will hopefully ensure the safety of school buildings across the country, eliminating the chances of another crisis like the one in Saugus, MA.

In an effort to ascertain the impact that these changes would have in practice, those previously interviewed in this study were again contacted and asked for their input on the changes. In general all of those interviewed agreed that the changes outlined above would be useful, and effective in practice.

Ms. Kathy Sullivan of Mercury Technical Services opened her comments with a bit of background on the motives shaping AHERA itself. When the AHERA document was written, she states, it was known that schools have limited resources and cannot devote the exorbitant amount of funds necessary to act upon the ACMs. The assessment reports and their recommendations exist only as suggestions as how to improve a school's condition since money cannot be funneled into such a project. However, she firmly believes that the assessment recommendations should be acted upon and approved of the changes regarding the reports and the more structured implementation of response actions. She did have some uneasiness about the fines associated with not conforming to these changes, as was alluded to in her statement on the creation of AHERA. When she reviewed section II subheading Q pertaining to state funding, Ms. Sullivan immediately asserted her approval.

In less critical reviews of the changes Saugus Superintendent of Schools, William Doyle and Town Manager Steven Angelo offered their approval of the proposed changes. Doyle and Angelo both stated that they felt that the proposed changes were necessary and would be helpful with out adverse ramifications in practice. They offered no suggestions for improvement to the changes.

### Planning For the Future

This study was successful in uncovering some of the shortcomings in the current legislation governing asbestos in schools. It was also successful opening new areas of study that should be pursued.

Although most of the recommended changes are purely administrative, and would be easily implemented into the current management plans, the idea of federal funding at this point does not lend itself to fluid implementation. In theory the idea of federal funding would supply the money needed to ensure the safety of all that enter a public school building. Where the funds for such assistance are to come from is a topic that needs additional research. This research could include an in depth study of the EPA, how it is funded, and how it can raise and appropriate money. Additional research may show that funding at the state level may also be a viable option.

In addition to a study on federal and/or state funding to alleviate the problems associated with asbestos in schools, some involved in this study feel that asbestos is a problem with a much larger scope. Indeed, asbestos is present in many shops, factories and other workplaces in operation today. With all that has been shown relating to the

health risks associated with asbestos, it may be time for strict regulations to be implemented in industry as well. A study into whether any such legislation exists, and if so its effectiveness, would prove to be interesting and extremely useful.

The pursuit of the above mentioned studies as well as others that stem from this or any other study are strongly encouraged. It is through research and studies that we learn how to live our lives more safely and productively in the future.

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This study would not have been possible without the following individuals and organizations who provided guidance, answered questions, offered opinions, and provided relevant information pertaining to the asbestos problem faced in Saugus, as well as the more general plight that all schools face with asbestos. Your time and efforts are greatly appreciated, and deserve notice.

**James K. Doyle**

*Faculty Advisor*

**William P. Doyle**

*Superintendent of Schools; Saugus, MA.*

**Steven Angelo**

*Town Manager; Saugus MA.*

**Kathy Sullivan**

*Mercury Technical Services; Worcester, MA*

**Ginny Nichols**

*Darling Asbestos Removal Brockton, MA*

**G&K Associates Inc. Worcester, MA**

*Asbestos Abatement Services*

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## **APPENDIX A**

**Summary of Tri Annual Reports issued to the Saugus Public Schools**

## **SUMMARY OF REPORTS BY BUILDING**

The following are summaries of the comparisons of annual reports relating to the presence of Asbestos in Saugus Public Schools. Tri-annual reports from 1992, and 1996 were compared to determine the asbestos removal, and maintenance throughout a three year period. It should be noted that this dissection of the tri annual reports is intended to show what can happen in general under the current asbestos regulation. It is no way intended to portray Saugus as being negligent in its efforts to control asbestos.

### **Veterans Memorial School:**

In 1992 there were seven homogeneous areas reported to contain asbestos. Five of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of storage rooms, bathrooms, crawlspaces and in one instance a class room. The damage included exposed insulation as well as flaking, peeling and otherwise severely damaged insulation. The remaining three of less concern were hallways classrooms etc where asbestos containing floor tiles and wall board were present in good condition.

In the subsequent report in 1996, all of the areas previously reported were again present. Of the 5 more severe areas, all five were again commented upon, and Response Action Recommendations were made. In most instances the description of the problem and the possible solution were paraphrased from the previous report. The three areas of less concern were also present again, they were however still in good condition.

## **Waybright School**

In 1992 there were four homogeneous areas reported to contain asbestos. Only one of which was considered severe enough to warrant a Response Action Recommendation by the inspection firm. This area consisted of a crawlspace. The damage included several broken and water damaged fitting insulation. The remaining three of less concern were hallways classrooms etc where asbestos containing floor tiles and wall board were present in good condition.

In the subsequent report in 1996, the all of the areas previously reported were again present. The more severe area, the crawlspace, was again mentioned, and Response Action Recommendations were made. The three areas of less concern were also present again, they were however still in good condition.

## **Oaklandvale School**

In 1992 there were six homogeneous areas reported to contain asbestos. Five of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of storage rooms, bathrooms, crawlspaces and kitchen space.. The damage included exposed insulation as well as insulation with holes in its protective covering and paper backed lighting fixtures. The remaining area of less concern was hallways classrooms etc where asbestos containing floor tiles and wall board were present in good condition.

In the subsequent report in 1996, four of the six severe areas had been abated. Only moderate damaged remained in the other two noteworthy areas, and Response Action Recommendations were made. The one area of less concern were also present again, the were however still in good condition.

### **Evans School**

In 1992 there were five homogeneous areas reported to contain asbestos. Only two of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of bathrooms and boiler rooms. The damage included exposed insulation. The remaining three areas of less concern were hallways classrooms etc where asbestos containing floor tiles, wall plaster and wall board were present in good condition.

In the subsequent report in 1996, all of the areas previously reported were again present. Of the two more severe areas, both were again commented upon, and Response Action Recommendations were made. In most instances the description of the problem and the possible solution were paraphrased from the previous report. One of the three areas of less concern, the wall plaster, had worsened and Response Action Recommendations were made. The remaining two areas of less concern were also present again, the were however still in good condition.

## **Ballard School**

In 1992 there were three homogeneous areas reported to contain asbestos. Two of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of an old cafeteria, bathrooms stairwells. The damage included exposed insulation, and damaged ceiling plaster. The remaining area of less concern were again bathrooms where ceiling plaster was present in good condition.

In the subsequent report in 1996, all of the areas previously reported were again present. Of the two more severe areas, both were again commented upon, and Response Action Recommendations were made. Some attempts were made to control some of the damage, but they were not sufficient. In both instances the description of the problem and the possible solution were paraphrased from the previous report. The areas of less concern were also present again with floor tiles added, and were still in good condition.

## **Lynnhurst School**

In 1992 there were six homogeneous areas reported to contain asbestos. Five of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of a kitchen, hallways, closets, multi purpose rooms and boiler rooms. The damage included exposed paper backing on light fixtures, and damaged pipe fitting insulation. The remaining area of less concern was floor tiles throughout the building.

In the subsequent report in 1996, most of the areas previously reported were remedied. Only one area where pipe fitting insulation was suspect remained. Additionally the floor tiles were commented upon, but were not considered a problem.

### **Saugus High School**

In 1992 there were twenty four homogeneous areas reported to contain asbestos. Fifteen of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of an Teacher lounges, bathrooms, gymnasiums, classrooms. Cafeteria and almost all conceivable areas of the building. The damage included cracked asbestos containing ceramic tiles, light fixtures, exposed insulation, and damaged ceiling plaster. The remaining area of less concern consisted of floor tiles, ceiling and wall plaster that was present in good condition, a fire curtain, wallboard petitions and various sealants and caulks all in good condition..

In the subsequent report in 1996, all of the areas previously reported were again present. Of the fifteen more severe areas, only one had seen the recommended repairs. In the other instances the description of the problem and the possible solution were paraphrased from the previous report. Additionally one of the areas not seen as a problem in 1992 now warranted a Response Action Recommendation. The remaining areas of less concern were also present and were still in good condition.

## **Belmonte Middle School**

In 1992 there were three homogeneous areas reported to contain asbestos. Two of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of a boiler room, and pipes throughout the building. The damage included damaged pipe fitting insulation, and boiler insulation. The remaining area of less concern was floor tiles throughout the building.

In the subsequent report in 1996, all of the areas previously reported were again present in the same state. An additional area was reported upon where insulation had become friable, a Response Action Recommendation was made. Additionally the floor tiles were again commented upon, but were not considered a problem.

## **School Administration Building**

In 1992 there were five homogeneous areas reported to contain asbestos. Four of which were considered severe enough to warrant a Response Action Recommendation by the inspection firm. These areas consisted of storage rooms, a kitchen, basement corridors, and boiler room. The damage included damaged floor tiles (throughout the building), ceiling panels, pipe fitting insulation, and a boiler gasket. The remaining area of less concern were additional floor tiles throughout the building.

In the subsequent report in 1996, all of the areas previously reported were again present in the same state. Additionally the floor tiles were again commented upon, but were not considered a problem.