Project Number: 44-MSF-2002

PRESCOTT STREET GATEWAY PARK PROJECT

An Interactive Qualifying Project Report

Submitted to the Faculty

Of the

WORCESTER POLYTECHNIC INSTITUE

In partial fulfillment of the requirement for the

Degree of Bachelor of Science

By

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Approved:

1. information
2. alternatives
3. communication

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Abstract

This project has determined several alternatives for the renovation of the Prescott Street Corridor located in downtown Worcester. Site evaluations, background information, and interviews were used to develop three different possibilities for the site. The recommended alternative is putting a sports complex in the Prescott Street Corridor. A sports complex would bring people into the city, create more interaction between the current residents, and establish a sense of history for the site.

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1.0 Introduction

The purpose of this IQP was to work in conjunction with the city of Worcester to develop several plausible options for the renovation of the Prescott Street Corridor. In working with city, the major contact was the Worcester Business Development Corporation, the corporation in charge of the site redevelopment. The redevelopment of the Prescott Street Corridor, located at the northern end of Worcester's Central Business District, is the first brownfields redevelopment project for the Worcester Business Development Corporation, also known as the WBDC.

In 1965, the Massachusetts State Legislature founded the Worcester Business Development Corporation as an affiliate for the Worcester Area Chamber of Commerce. Since its inception over 35 years ago, the WBDC has served as the official economic development agency of the city of Worcester. As Worcester's official economic development agency, the WBDC has served the city over the past few years to develop seven industrial parks, to create thousands of jobs, and to expand the region's industrial tax base significantly. It is anticipated that the WBDC will have continued success in the future rebuilding and renovating the city of Worcester.

Combining the successful past of the Worcester Business Development Corporation with some new and creative ideas, several ideas for the renovation of the Prescott Street Corridor were developed that should be extremely beneficial to the city of Worcester.

1.1 Urban Renewal, Renovation, and Growth

The issue of urban renewal, renovation, and growth has a continued importance in our society. As such, there is a constant change in beliefs and ideas about how urban development should be handled. Over a significant number of years, many people have studied the importance of urban renewal and the factors that make renovation successful. One of the many men who have evaluated certain aspects of urban growth over an extended period of time is Kevin Lynch from the Massachusetts Institute of Technology. Lynch believes that the visual aspects of the city are the main reasons that people come into a city or area. He breaks these visual aspects into five categories: (1) paths, (2) edges, (3) districts, (4) nodes, and (5) landmarks. The number and beauty of these five visual aspects will then determine the movement within and into the area. Although beauty is a major issue in renewal, there are no clear criteria for beauty. There are no guidelines on what must exist and where it must exist. Also, according to Lynch, there is no evidence that the beauty of an area or a city actually leads the population within that city to have a good life or improve well being (Eldredge).

Many of the studies being done examine certain rural settings and evaluate what is present in that environment and how that might affect the movement within the area and the expansion of that area. Through this examination, it is apparent that many trends for urban development exist in our society. Using the most current trends that continually show results, many countries set up vague guidelines to follow in order to achieve success in the rural environment. In Europe, there are currently four steps being taken to ensure healthy expansion and movement: (1) there must be an established relationship between rural and urban settings, cities and towns, regions and nation, etc.; (2) there must be an attempt to preserve and promote contact with nature as much as

possible, for example, there must exist a significant amount of green space; (3) the renovations must maintain the historical character of the area, (4) there must be continually urban growth, so the existing layout must be adaptable to future urban growth (Huith).

Another current trend is that new towns revitalize old cities and new towns need the historic character of the old cities. Therefore, there must be a healthy combination of old and new. This combination of new towns and old cities helps accommodate population growth, furthers urban growth, and keeps the culture intact (Huith).

A major issue concerning urban development and renewal is finances. Many communities have set up criteria that must be met in order for a renewal project to receive any financial aide. The most common guidelines include the following: (1) there must be a combination of open space and relatively higher density, (2) the renewal must plan for commerce, industry, residential, and recreational all to exist together; (3) equal opportunity housing must be included; (4) also included must be a substantial number of low cost housing. When these criteria are met, financial aide is usually granted as these aspects are seen as things that promote healthy and equitable growth (Huith).

As stated before, it is critical to take into account the historical character of an area before renovations or renewal can take place. Preserving sites is often a function of the government; however, action should be initiated by private organizations and individuals in order to assure that preservation occurs. There are three basic steps in the saving historic resources: finding and describing the resource, evaluation and registration, and protective strategies. The first step is basically gathering of information. In most cases, history and architecture take precedence. Those sites with significant historic

value and unique architecture get looked at first. The sites are then surveyed at the state and local levels of government. Once the surveying has been done, the second step, which is evaluation, can begin. Evaluation is done in two orders. The second order evaluation grades and classifies the resource while the first order places the resources in categories. Designation of a site as one to be preserved is done in one of three ways. It can be done automatically. Or, more typically, there is a passage by the legislature of a statute or ordinance documenting designation. Lastly, recognition can come directly from a government official such as a governor, mayor, or even the President. Once the site has been recognized, steps must be taken to protect the site from both man and time. Protection against man can range from pressuring the owner to banning demolition altogether. Protection against time is more complicated and usually involves stabilization, preservation, and restoration (Stipe).

1.2 Project Statement

The redevelopment of the Prescott Street Corridor, located at the northern end of Worcester's Central Business District, is the first brownfields redevelopment project for the Worcester Business Development Corporation (WBDC). The WBDC was created in 1965 by the Massachusetts State Legislature. The WBDC's purpose is to serve the Worcester Area Chamber of Commerce as an affiliate; the corporation is Worcester's official economic development agency (WBDC *Brownfields Site Assessment Proposal*). Over the past 35 years, the WBDC has developed seven industrial parks, created thousands of jobs, and significantly expanded the region's industrial tax base.

The Prescott Street Corridor's 55-acres is located at the northern end of Worcester's Central Business District (See Figure 12). The site is both very visible and accessible to Intersate-290. The Corridor is surrounded by many cultural and educational venues such as the Worcester Art Museum and WPI. Moreover, the surrounding area has received considerable renovations over the past few years. Recently, there has been a massive infusion of private investment into the area, most notably the Courtyard by Marriott.

In the past, the Prescott Street Corridor has served many uses, including the northern plants for United States Steel (USX). For many years both steel and wire were manufactured in the area. Not surprisingly, renovation projects in surrounding areas have located and subsequently treated soil contaminates consistent with steel manufacturing operations.

As for the buildings currently in the Prescott Street Corridor, there have been current renovations there as well. Recently, the 80,000 square foot Northworks Building was fully restored to reflect its historical significance and fulfill demand for a variety of

uses. Currently, 59,000 square feet of the building is leased up. Tenants in the area include two major restaurants, a financial services company, and many small businesses.

Both the City of Worcester and the Commonwealth of Massachusetts have deemed the Prescott Street Corridor an Economic Opportunity Area, known as an EOA. It received this designation because the conditions of the site are consistent with the regulations of Economic Development Incentive Program (EDIP).

The budget of the WBDC reflects its commitment: to provide a 20% match of funding for the grant ($10,000); to provide low interest loans to property owners to complete the environmental remediation necessary for the project; and to establish a $50,000 revolving loan fund for environmental clean-up costs.

The purpose of this report is to propose several alternative plans to make the Prescott Street Corridor 1) a sight-pleasing landmark from Interstate-290, 2) a mixture of feasible uses, 3)a site that relates to its surrounding uses, and 4) a model of rehabilitation of a brownfield site into a crucial urban link.. The accomplishment of these objects will attract more people off the highway and into the city, as well as to benefit the local businesses already in existence, provide economic development to the area by attracting new businesses, and provide historical preservation of existing buildings.

1.3 Literature Review

Our objective was to help the city of Worcester develop several possibilities for the Prescott Street Corridor. In order to properly assess the situation, it was necessary to have a variety of background information. The research began with urban renewal and renovation and how the growth of a city is impacted through renovation. Next, came the review of the site history, including what buildings were there and the buildings' past and current utilization. Gathering this information was necessary in order to understand the history and apply it to our alternatives. After the history, it was important to research brownfields in an effort to comprehend the amount of cleanup the site would have to undertake for each of the alternatives. Finally, information was gathered about the WBDC itself and the other corporations involved in the project.

1.4 Methodology

The purpose of this project was to develop several possible renovation alternatives for the Prescott Street Gateway area and then decide which alternative was the best. Before looking at the site, our first step was to identify which needs for the site were most important by both our standards and the standards of the city. It was concluded that site must foremost be both visibly pleasing and inviting from Interstate-290, for the purpose of bringing more people into the city. It was also important to keep as many historical aspects of the site intact while making it more useful to the city. As students at Worcester Polytechnic Institute, involving the college in the possible renovation of the site was preferable.

After identifying the most important needs for the site, the next step was to gather as much information about the site and its possible renovation as possible. This step entailed several site visits, research on the site and on brownfields, and using the views of many contacts involved with the site.

The final step was to take all the information gathered and apply it to the needs of the site that we had determined in the beginning. In doing so, three possible alternatives for the site were developed: a sports complex for WPI, complete renovation for each of the buildings, and extension of the cemetery and making of a park. It was then decided that the best alternative would be the sports complex for WPI because it best fit the needs of the city and was the best billboard for what is good about the city of Worcester, which then became our recommendation for the city of Worcester for the Prescott Street Gateway Project.

2.0 Background

Understanding the previous history of the site and the current conditions of the site help to explain how the site has evolved. From the mid 1850's until now, the land has been constantly developed, changing with the time period and the growth of the city. Much of the previous construction has been documented, but it is important to learn the history to get an idea of the types of problems the site has, so proper cleanup procedures can be instituted, and possible funding can be obtained to help remove all the waste from the site.

2.1 Site Background

The central area of our site, 75 Prescott Street, can be seen on Worcester Tax Assessor's Maps 1 and 3. The location is positioned on the Worcester North, Massachusetts, U.S. Geological Survey (USGS) 7.5 x 15-minute series Quadrangle (See Figure 12).

According to the Worcester, Massachusetts, USGS Quadrangle, the nearest surface water body is Salisbury Pond, which is located approximately 1,200 feet to the northwest. Salisbury Pond can be seen in relation to the site (See Figure 4). The USGS Quadrangle indicates that topography of the region surrounding the site varies; the area is generally flat and gently slopes to the northwest. The site is approximately 490 feet above mean sea level. Given the location of Salisbury Pond, groundwater can be expected to be present at a depth of 10-15 feet below grade and flow to the north. Any property located to the south of the site is considered hydrologically upgradient and any property to the north of the site is considered hydrologically downgradient; properties to the east and west of the site are considered hydrologically crossgradient.

According to the review of a Massachusetts Geographic Information (MassGIS) Map of Worcester, maintained at the Massachusetts Department of Environmental Protection (MA DEP) Central Regional Office in Worcester, the entire site is located within a high-yield, non-potential drinking water resource area. The site is not located in a Zone II drinking water protection area and the nearest public drinking water wells are located approximately 2 ½ miles to the east-northeast. Based on the review of the MassGIS map, there are no potentially productive aquifers within a 2-mile radius of the site. According to the Worcester Board of Health, there are no records of private drinking water wells within a 2-mile radius. Also, there are no records of release of oil and/or hazardous material at the site or on the abutting properties.

In addition there are no additional Underground Storage Tanks (USTs) registered for abutting properties. According to the Worcester Board of Health, no files documenting health violations or incidents involving release of Oil and/or Hazardous Material (OHM) exist for the site or abutting properties.

2.1.1 Site History and Previous Buildings

For all street references see Figure 5.

In 1770, on the north side of Lincoln Square stood Salisbury Mansion. This was a home of fashion and wealth. It was also the scene of social gatherings held by Madam Salisbury. After her death the house was used as a private school for a few years. The house was later moved to the corner of Lancaster Street and Institute Road, where it now stands, to allow for the development of the Boys' Club (Spears 44, 150).

The militia muster ground in 1823 was on the site of the American Steel and Wire Company (Spears 142).

The rural cemetery was started around 1838. Many of Worcester's leading people, along with Revolutionary soldiers, are buried there (Spears 143). The cemetery can be seen in Figure 9.

Northwest of Mill Brook was an old ball field and circus grounds (Spears 143).

In 1846, the Hancock Lincoln Mansion was moved from Lincoln Street to the south corner of Grove and Lexington Streets. The building when standing was labeled with an inscription stating:

"Built in 1741 by

Daniel Henchman on Lincoln St

And for many years owned by Governor

John Hancock

Home of Levi Lincoln

Attorney-General of the United States

Levi Lincoln Second

and John Davis

Governors of Massachusetts".

On the Grove Street site the building was home to five chief executives of the state (Spears 141).

Also on Lexington Street, behind the Hancock Lincoln house was the old Walker house. This house was built in 1740 and moved from its original location on Salisbury Street (Spears 142).

Just south of the cemetery was an area called Northville (See Figure 7). In this area on the west side of Mill Brook, Ichabod Washburn started the wire industry in 1831.

"He employed five men, with a daily output of 300 pounds of wire."(Spears 144) Ichabod Washburn had moved into Worcester in 1819 and had been working with William Hovey making hay cutters (Erskine 49). Around 1829, Washburn began manufacturing wire. He was also making screws at his factory in Northville, on Mill Brook. Washburn was a pioneer in the wire industry, working to improve methods so that longer lengths of wire could be drawn at a time. In 1834, a new factory was built to be 80' by 40', to house Washburn in one half and the Phelps and Bickford loom works in the other half (Erskine 60). These were the first power looms ever manufactured (Spears 144).

Around this same time Mill Brook was dammed to provide the power for the new factory. With the damming of the brook, one of the meadows owned by Salisbury had to be dug out and a grove of willows surrounding a swimming place had to be destroyed. A piece of this past was saved with the naming of Grove Street as the street that ran along the front of the factory. The smoke and steam coming from the factory was a sign to Worcester citizens that business was good and the town would prosper (Erskine 61).

Around 1848, hoopskirts became popular with the ladies and Washburn's crinoline wire rapidly replaced the expensive whalebone. The factory could turn out 60,000 pounds of crinoline wire per week. Ichabod Washburn also experimented with telegraph and piano wire. The Washburn factories were the "economic cornerstone" of the new Worcester (Erskine 67). "By 1880, the firm of Washburn and Moen was producing 58 percent of all the wire made in the United States, and its payroll supported one sixth of the city's population." (Erskine 84)

According to an 1892 Sanborn map, across Lexington Street there were about six residences lining the south and southwest borders of the site. On the southeast portion was the Church of the Immaculate Conception (See Figure 6). Further up Grove Street, was the American Steel and Wire plant. This company included an annealing building, oil house, six storage tanks, two warehouses and a scrap-wire shed. In 1929, American Steel and Wire was still producing steel and springs. Behind the plant was Mosquito Pond, a famous swimming hole of the local boys. Across Grove Street to the west were the Logan, Swift, and Brigham Envelope Factory (Ransom 5). See Figure 7.

On 1910 and 1936 Sanborn maps, the above area was generally the same with the addition of a tinning building, a die factory, and private railroad tracks for the steel and wire company. Also, on the 1936 map a filing station with three underground storage tanks is shown in the southwestern corner of the site (Ransom 5).

As of 1950 maps, the residential buildings, church, and filing station still remain. Most of the buildings in the west and central portion of the site associated with the American Steel and Wire Company have been demolished (Ransom 6).

According to a 1978 Sanborn map, the Immaculate Conception Church and residences along the south portion of the site no longer exist. That area contained a small commercial building, one residence and a small storage building. The filling station was replaced by a commercial building. The center of the site is a large parking lot. The U.S. Envelope Company adjacent to the west side has been replaced by Parker Metal Goods. The Worcester County electric Company abuts the site to the northwest. Also in the north, Parker Metal Goods occupies the previous location of the American Steel and Wire Company (Ransom 6).

Across from the wire works near the present sluiceway of Salisbury Pond was a favorite place for baptisms. This activity was occurring between 1895-1930 (Spears 142).

To the east, across Prescott Street, there were two apartment buildings from about 1946-1973. The site is currently used as a parking lot (Zecco 4).

Although the New England Plating Company, Inc. was started in 1933, it didn't move to its current location at 31 Garden Street until 1953. Flooding was an issue for many years until the Mill Brook diversion project was completed during the 1960's. The company also went through some tough financial times caused by demands of the Water Quality Office for wastewater treatment; but it managed to pull through and even start some expansions (Erskine 177). The company is still running at the present time.

In 1955, Lincoln Square underwent a significant renovation, and the railroad tracks were laid through an underpass. This eliminated the hassle of the automobiles having to wait for the trains to pass through the intersection. At this time Mill Brook was directed into underground culverts (Erskine 132). See Figure 3.

2.1.2 Current Site Conditions

Today the area of 85 Prescott Street contains some businesses that have renovated the existing buildings to accommodate the needs for their business. The Massachusetts Lottery is located in one of the buildings, and Marriott Hotel purchased land in the area and constructed a hotel. Some of the buildings have not been occupied for years, are beginning to deteriorate, and have become a concern for the City of Worcester. The site is very visible from Interstate 290 and doesn't present a warm welcome to tourist. The

idea is to follow the steps of the new businesses and the Marriott Hotel to help redevelop the site.

2.1.2.1 Surrounding Businesses

The following is a list of the buildings that are in the surrounding area of the site. Along the east side of Prescott Street, as seen in the color photos of the appendix, there is a two-story furniture warehouse, a one-story furniture warehouse and a three-story storage space, and a universal supply company. On the south side of Garden Street, there is the New England Plating Company Inc. Also located in the area is The Massachusetts Lottery Building, Commonwealth Stationers Inc, Paper World Party Supplies, Visigraphics, Hygienic Mattress Company Inc., Parker Metal Corporation, Worcester Vocational Technical High School, Aurolite Corporation, K&D Magmotor Corporation, G&R Screw Machine Products Inc., Keating Enterprises Inc., Ravine Beech Company Inc., Mason R P Inc., Wright Line, The Central Massachusetts Shelter for Homeless Vets, the Juvenile Court building, and a Massachusetts Electric Company substation and transformer storage property.

In Appendix (E), there are digital pictures of the buildings that are being evaluated for the Worcester Business Development Corporation.

2.1.2.2 Construction of Marriott Hotel

In early December 1997, Ransom Environmental Consultants, Inc. performed Phase 1 of an Environmental Site Assessment (ESA) on the property located at the intersection of Lexington and Grove Street in Worcester. The ESA was performed on a

2.59-acre parcel of developed land occupied by the Blue Belle Diner, a large paved parking lot, and a two-story commercial building.

The purpose of the ESA was to document the environmental history of the site, to evaluate the likelihood that a release of oil and/or hazardous material (OHM) has occurred or has the potential to impact the site, and to provide a professional opinion regarding the environmental condition of the site. Ransom subcontracted Smith & Wessel Associates, Inc. to conduct an asbestos investigation of the two buildings located on the property at that time. The ESA was performed in accordance with the American Society for Testing and Materials (ASTM) Standard E 1527-97.

Based on the information gathered by Ransom in their ESA, they determined the following;

(1) The site is designated on Worcester Tax Assessor's Maps 1 and 3, Blocks 3 and 32B, and Lots 2, 5, and 6. The Site is bordered to the east, north, and west by Grove Street, Lexington Street, and Prescott Street, respectively. The Site is presently owned by the Parker Realty Trust, which has owned the Site since December 30, 1971. The Site consists of a nearly rectangular-shape, 2.59-acre parcel of land. The majority of the Site consists of a large, paved parking lot and features two buildings. The Blue Belle Diner building is located at the southeastern corner of the Site and a two-story commercial building occupied by Myers Performance Equipment is located at the southwestern corner of the Site. The Blue Belle Diner and the two-story commercial building were constructed in 1972 and 1895, respectively. The Site is presently abutted by commercial and industrial properties.

(2) Based on Site topography, the results of this investigation, regional topography, and the location of Salisbury Pond, groundwater at the Site is expected to flow in a northwesterly direction.

(3) The Blue Belle Diner is presently heated with natural gas and the two-story commercial building is presently heated with No. 2 fuel oil, which is stored in an above ground storage tank (AST). Both buildings are serviced by municipal water and sewer utilities.

(4) Sanborn Fire Insurance Maps, dated 1892, 1910, and 1936, indicated that the majority of the site was occupied by the American Steel and Wire Company. During this period, a building with tinning and galvanizing operations occupied the western portion of the Site, a building with annealing operations occupied the northeastern corner of the Site, and a die foundry was present at the central portion of the Site. In addition, the 1892 and 1910 maps indicated that an oil house and six storage tanks immediately abut the northern portion of the Site. The Sanborn maps provided no indication as to whether the storage tanks are underground or above ground. The Immaculate Conception Church occupied the southeastern portion of the Site. The 1936 map also indicated that a filling station with three underground storage tanks directly abutted the southwestern corner of the Site. The 1950 Sanborn map is consistent with previous maps with respect to the presence off the Immaculate Conception Church and the abutting filling station; however, the buildings associated with the American Steel and Wire Company are no longer shown to exist at the Site and were apparently demolished.

(5) According to the Worcester Fire Prevention Office, two 3,000 gallon and one 2,000 gasoline underground storage tanks were registered for the former filling station

(abutting to the southwest) in 1936. There are no records regarding the removal of these underground storage tanks. There are no records of the underground storage tanks registered for the Immaculate Conception Church or the five American Steel and Wire Company buildings formerly located at the Site. In addition, there are no additional records of underground storage tanks registered for abutting properties.

(6) Based on a review of environmental databases by EDR, nine State Hazardous Waste Site (SHWS) and two Leaking Underground Storage Tanks (LUST) sites are located within a one-mile radius of the Site. Of the nine listed SHWS, three are located within a ½ mile radius of the Site. One of the SHWS (the Worcester Telegram & Gazette is also listed as the Comprehensive Environmental Response and Liability Information System (CERCLIS) site. The two LUST sites are located within a ½ mile radius of the Site. Based on a review of files at the MA DEP Central Regional Office in Worcester, Massachusetts, the disposal sites identified by EDR are unlikely to adversely impact the environmental conditions of the Site. This conclusion is based on the remedial activities conducted at the properties, expected groundwater flow directions, and the location of the disposal sites relative to the Site.

(7) With the exception of a 275-gallon fuel oil above ground storage tanks present in the basement of the two story commercial building, no evidence of a release of oil and/or hazardous material or oil and/or hazardous material storage was observed at the Site. Evidence suggesting a release of fuel oil from the above ground storage tank was not observed.

(8) As part of the assessment, an asbestos inspection was performed. The results of the inspection indication that friable and non-friable ACBM is present inside the two-

story commercial building. Although non-friable ACBM is present inside the Blue Belle Diner, no friable ACBM was found.

(9) Based on the results of this ESA, additional investigation is warranted at the Site to assess potential impacts to soil and groundwater at the Sites as a result of the historical uses of the Site.

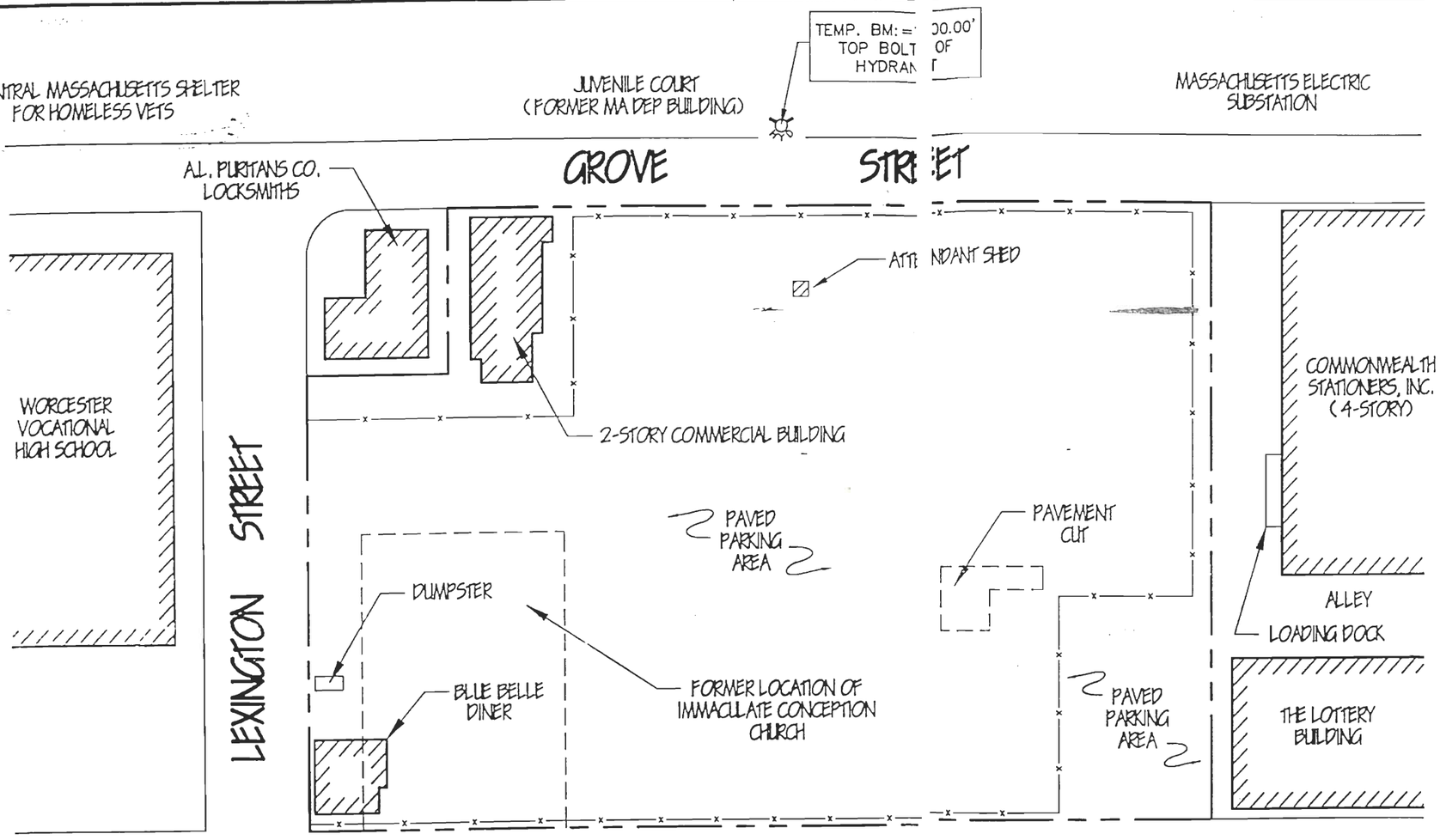
In order to determine the amount of contaminates located at the site of 85 Prescott Street, an ESA will need to be completed to help understand the history of the site to properly assess the problem. Figure 1 is the site plan designed by Ransom Environmental Consultants, Inc., for Marriott International, Inc. This site plan represents what could be used to complete an ESA of 85 Prescott Street.

All the results listed above (1-9) were obtained by Phase I Environmental Site Assessment, Lexington and Grove Streets, Worcester, Massachusetts – Prepared by Ransom Environmental Consultants, Inc.

Brown's Wharf – Newburyport, Massachusetts

Project 971120

FIGURE 1



NOTES:

1. SITE PLAN BASED ON CITY OF WORCESTER ASSESSORS MAPS 1 AND 3 AND ON OBSERVATIONS MADE BY RANSOM ENVIRONMENTAL CONSULTANTS, INC. ON DECEMBER 3, 1997.
2. ALL LOCATIONS ARE APPROXIMATE.
3. THIS MAP HAS BEEN PREPARED FOR MARRIOTT INTERNATIONAL, INC. ALL OTHER USES ARE NOT AUTHORIZED, UNLESS WRITTEN PERMISSION IS OBTAINED FROM RANSOM ENVIRONMENTAL CONSULTANTS, INC.

LEGEND:

- SITE BOUNDARY
- FENCE
- BUILDING

0 30 60 120

APPROXIMATE SCALE In FEET 1"=60'

RANSOM Environmental Consultants, Inc.

PREPARED FOR:	SITE:	SITE PLAN
MARRIOTT INTERNATIONAL, INC. ONE MARRIOTT WAY WASHINGTON, D.C	PARKING LOT/ DINER LEXINGTON AND GROVE ST WORCESTER, MASSACHUSETTS	DATE: DECEMBER 1997 PROJECT: 971120 FIGURE: 2

f:\projects\phase1\971120\

2.1.2.3 Current Pollution

It is hard to actually determine the pollution that is present in the area of 85 Prescott Street, without an Environmental Site Assessment. From the DEP records, we know that they have diagnosed the site as an Economically Distressed Area in Worcester, which allows a developer to receive funding because of the pollution created in the past. Also, brownfields are playing an important role in determining the actual pollution of the site, for which funding is provided to help cleanup the site. After reviewing the results of the Environmental Site Assessment performed by Ransom Consultants, Inc., of the buildings that existed at the location of the new Marriott Hotel, the prior buildings had a form of asbestos, which we could assume some of the remaining buildings could contain.

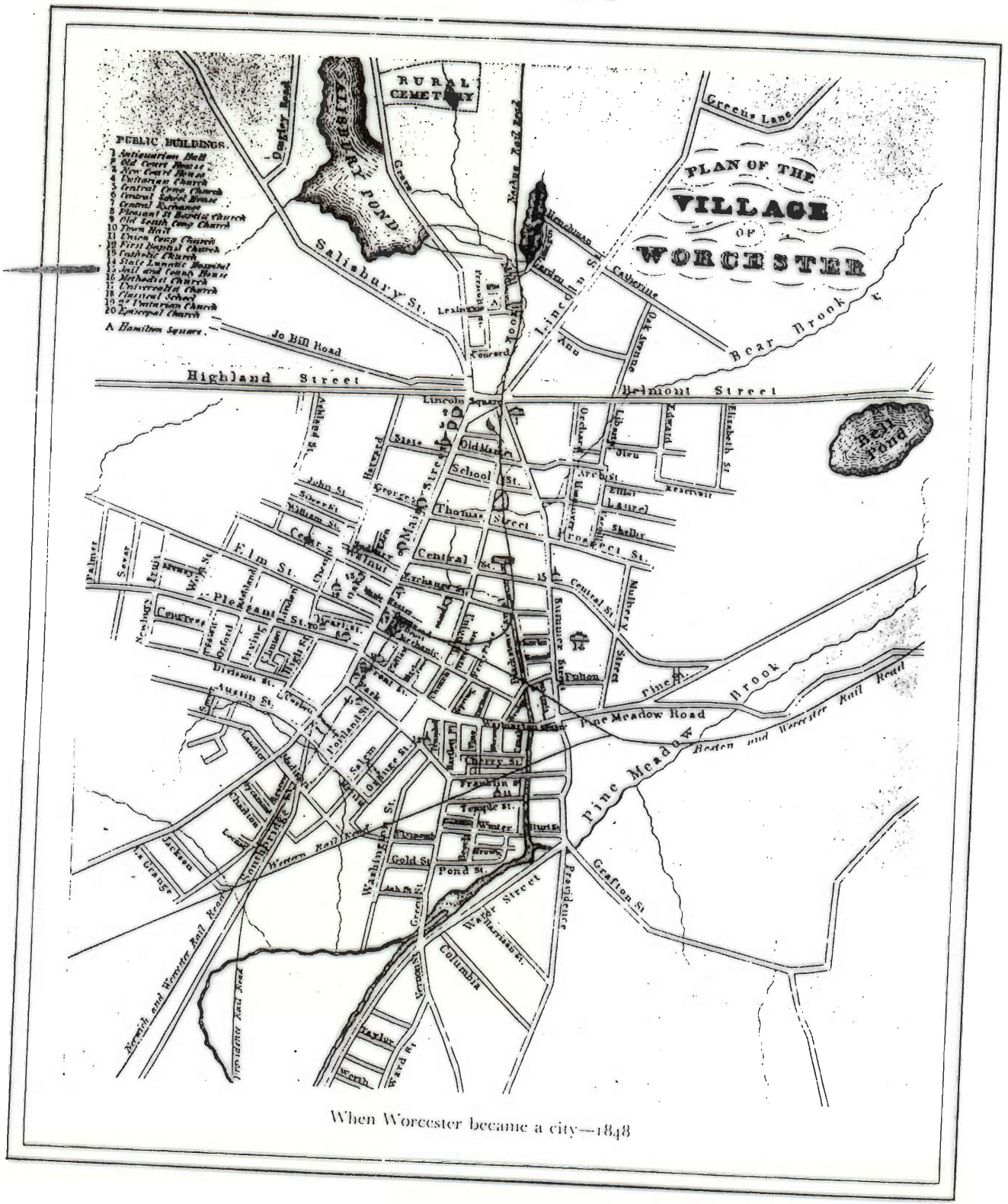
2.1.3 Maps

The following map, figure 2, is a plan of the town of Worcester in 1848. Including this maps helps to give an idea of the previous site layout and the occupants of the land, to determine what kind of contaminates could be polluting the existing site.

Figure 2, is a map of Worcester when it became a city. A transparencies of this map is included so it can be placed of Figure 4, Detail Map 215686.1S of the current site conditions, to determine the location of Mill Brook, which once flowed through the site before it was relocated underground to accommodate new construction on the site.

Figures 6-10 are pictures of Fire Insurance Maps of the site in the early 1900's. These maps show the first development of the site and the probable cause of the existing pollution that is there today. Each picture shows the exact layout of a certain area throughout the entire site. Some of the buildings in the pictures still remain today, but others have been destroyed and rebuilt. Due to the condition of these maps, digital pictures had to be taken because they could not be photocopied.

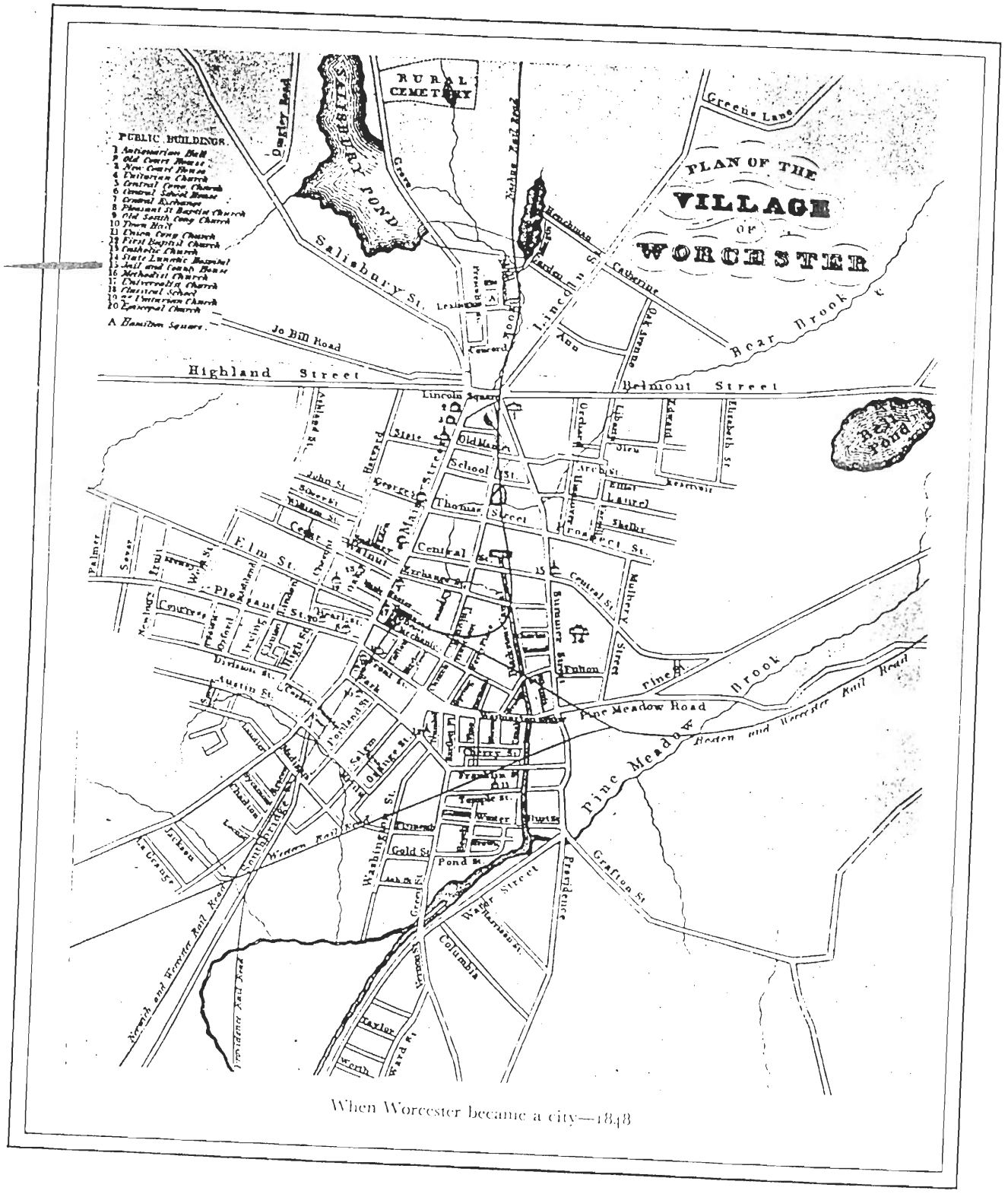
1848 WORCESTER 1948 CENTENNIAL



When Worcester became a city—1848

FIGURE 2

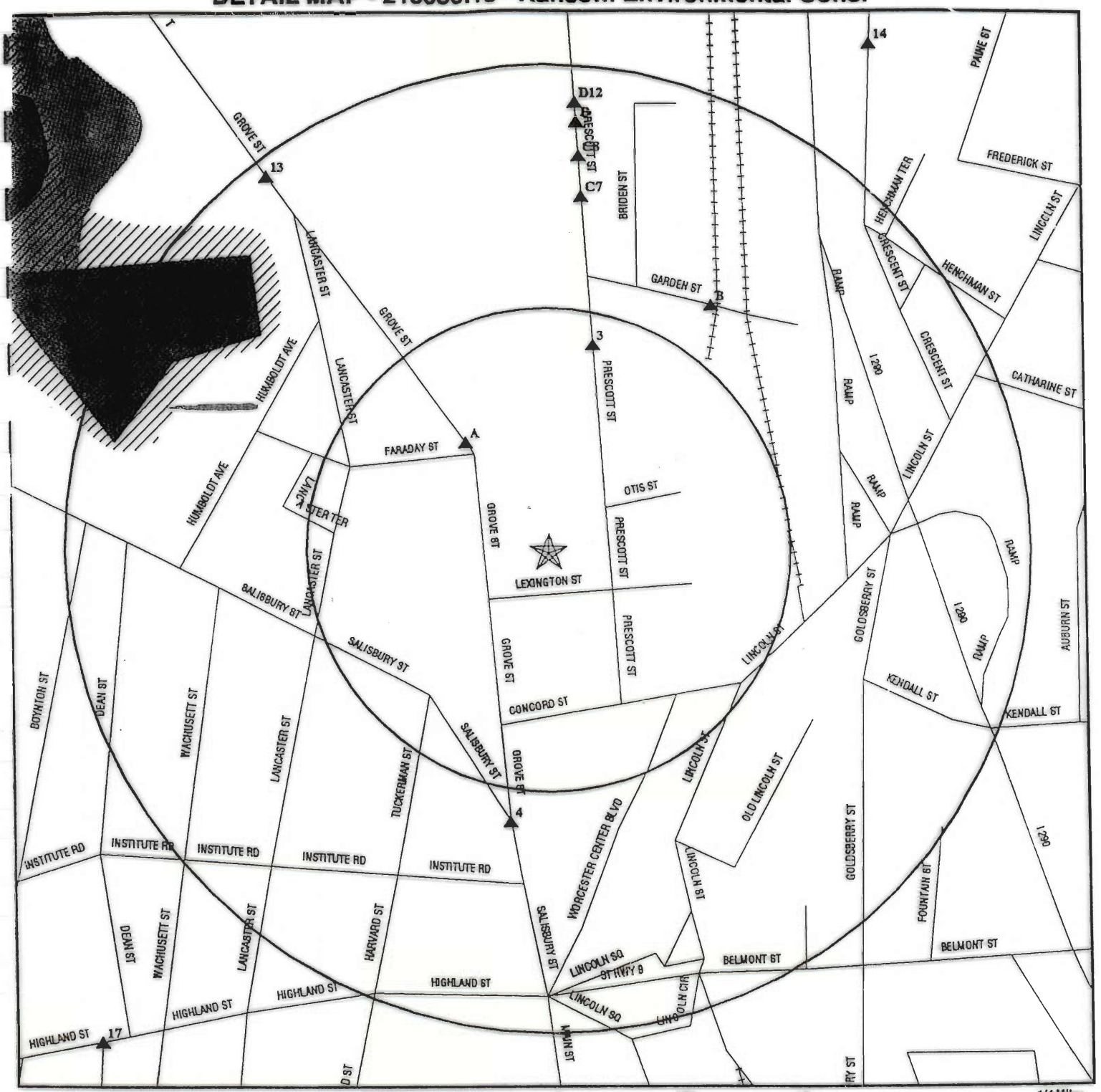
1848 WORCESTER 1948 CENTENNIAL



When Worcester became a city—1848

FIGURE 3

DETAIL MAP - 215686.1s - Ransom Environmental Cons.

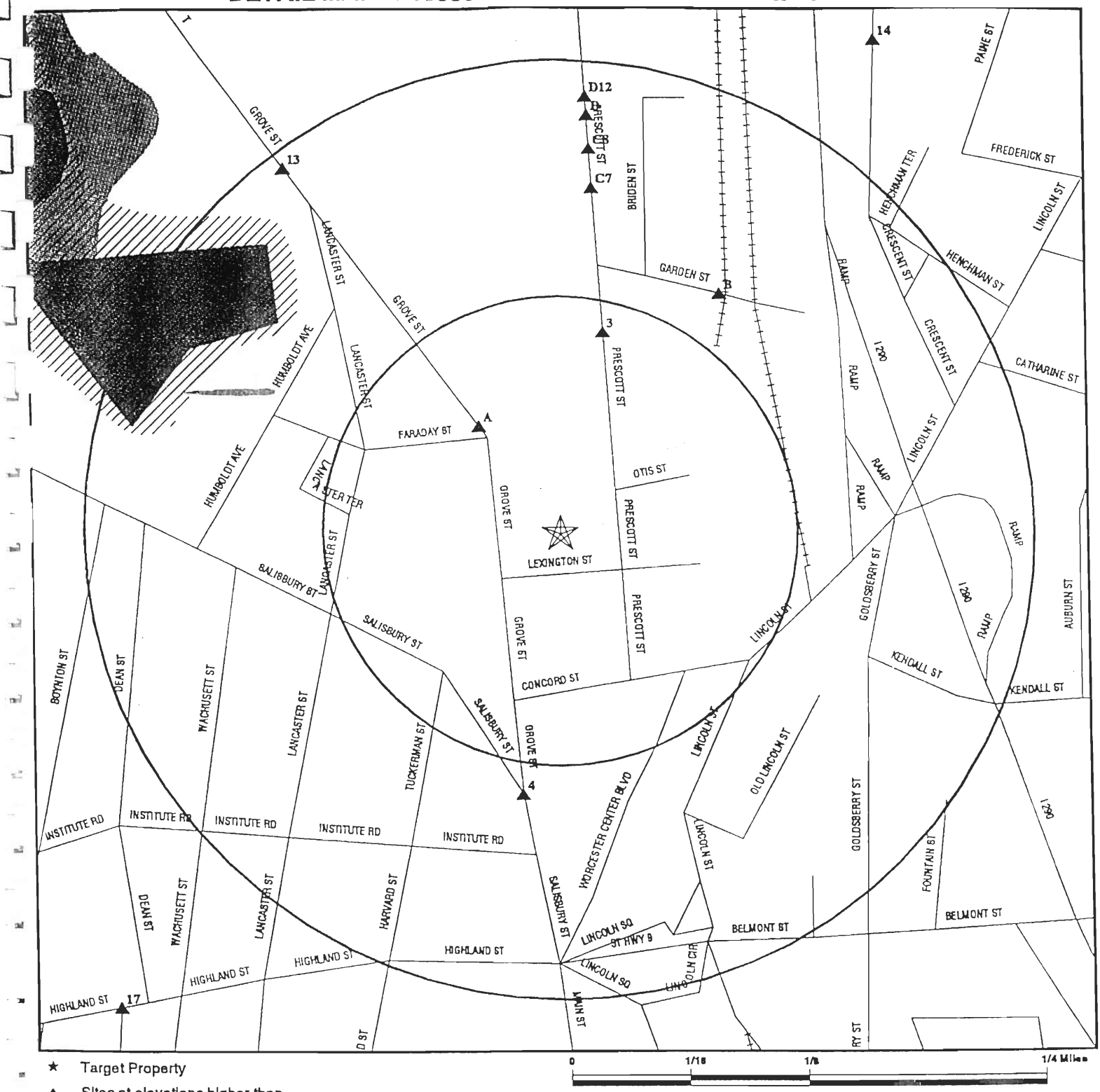


- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Wetlands per National Wetlands Inventory (1994)
- Areas of Critical Environmental Concern

FIGURE 4

TARGET PROPERTY:	Blue Bell Diner	CUSTOMER:	Ransom Environmental Cons.
ADDRESS:	66-98 Grove St	CONTACT:	Mr. Doug Lindsay
CITY/STATE/ZIP:	Worcester MA 01609	INQUIRY #:	215686.1s
LAT/LONG:	42.2748 / 71.8003	DATE:	December 04, 1997 11:19 pm

DETAIL MAP - 215686.1s - Ransom Environmental Cons.



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Wetlands per National Wetlands Inventory (1994)
- Areas of Critical Environmental Concern

FIGURE 5

TARGET PROPERTY:	Blue Bell Diner	CUSTOMER:	Ransom Environmental Cons.
ADDRESS:	66-98 Grove St	CONTACT:	Mr. Doug Lindsay
CITY/STATE/ZIP:	Worcester MA 01609	INQUIRY #:	215686.1s
LAT/LONG:	42.2748 / 71.8003	DATE:	December 04, 1997 11:19 pm

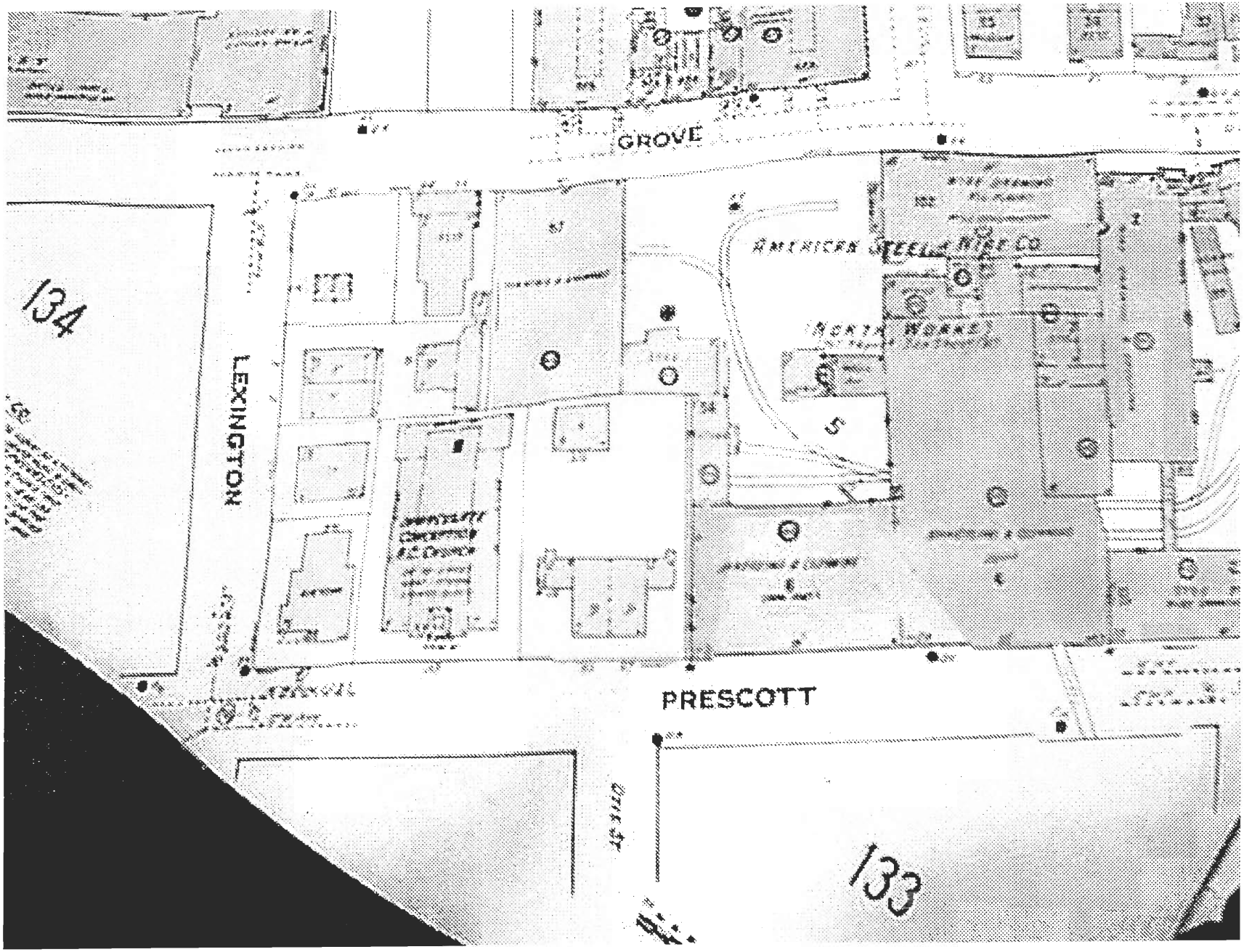


Figure 6 – Fire Insurance Map of Church and the American Steel and Wire Company

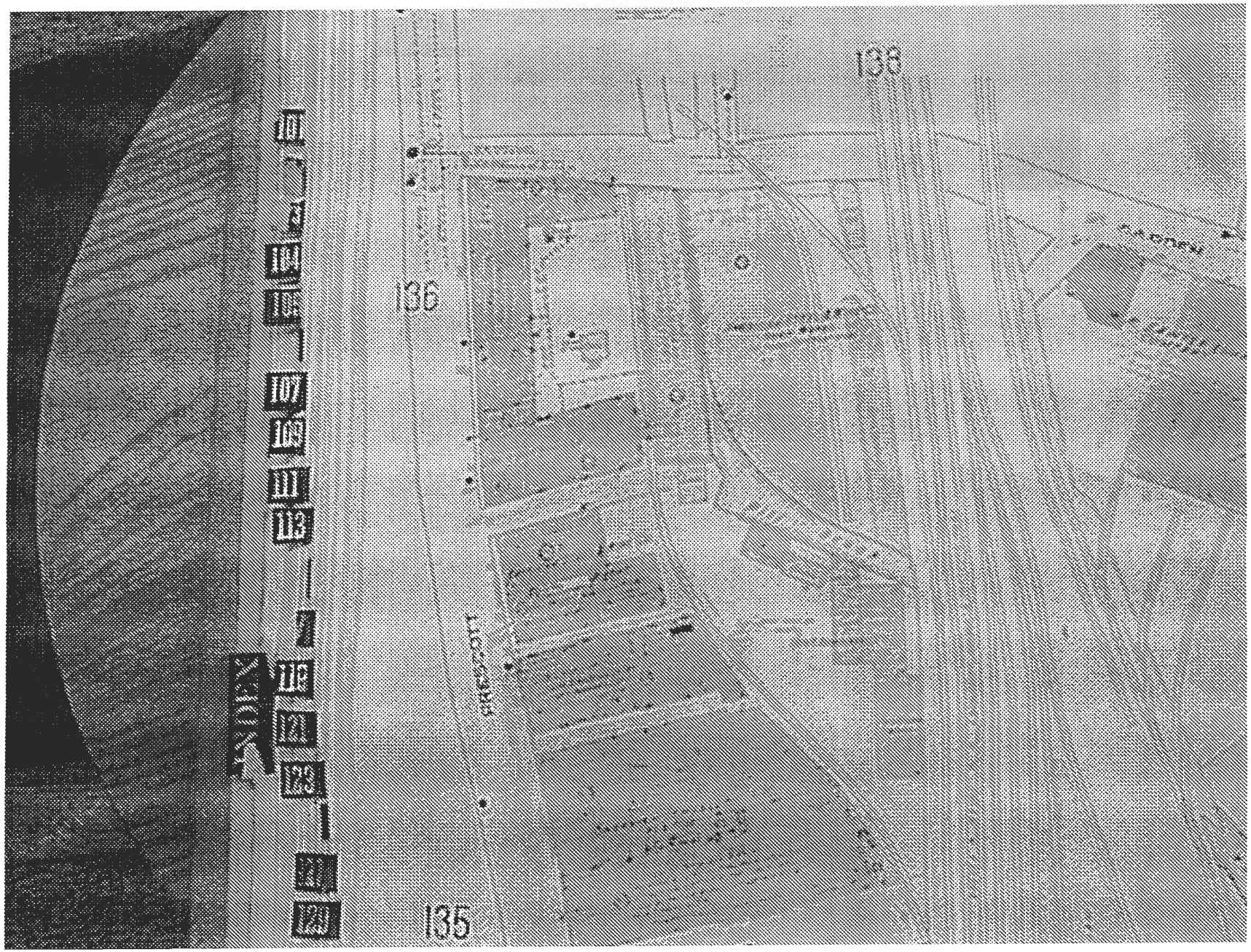


Figure 7 – Fire Insurance Map of the Envelope Company, P&W Railyard and American Steel and Wire Company

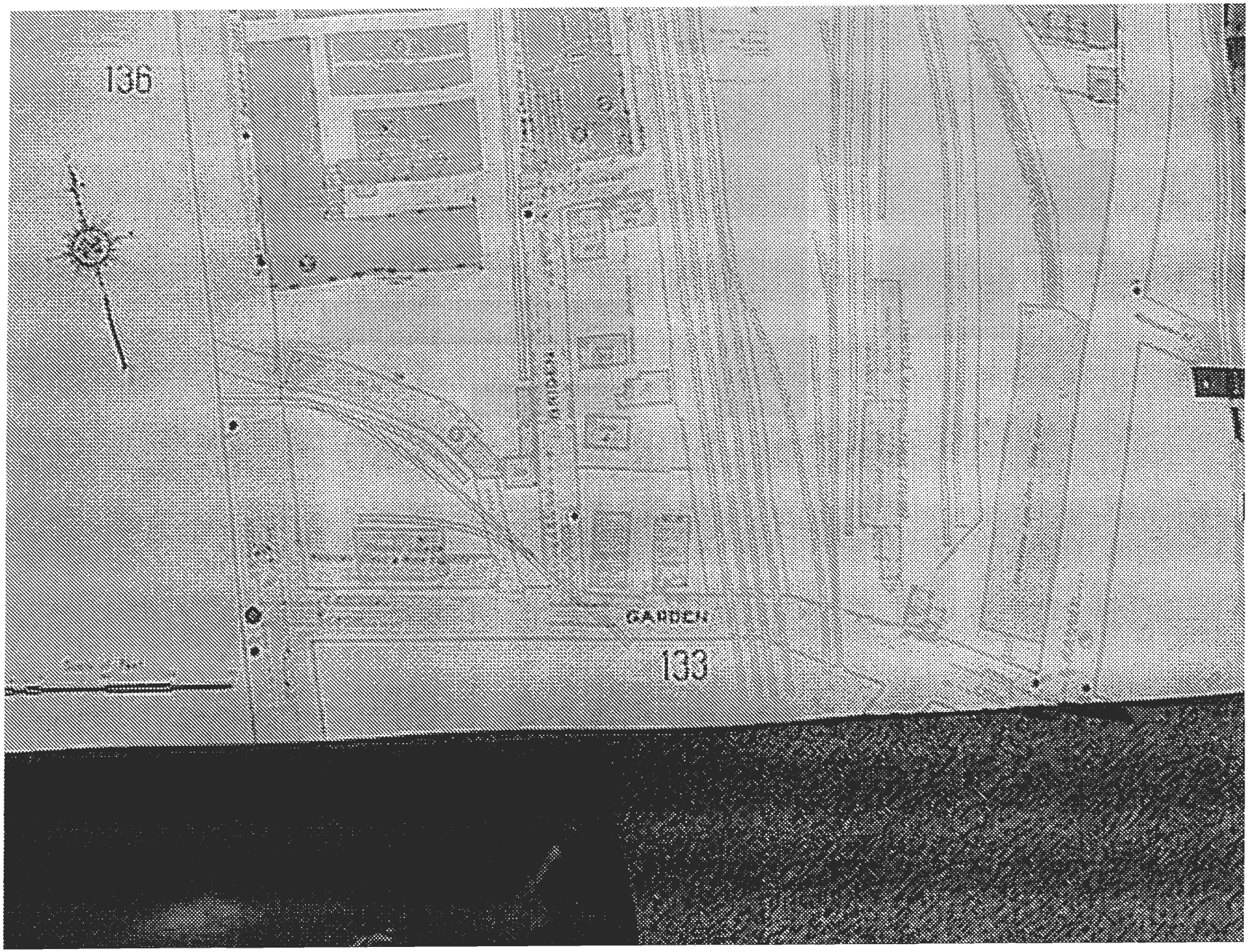


Figure 8 – Fire Insurance Map of the north side of Garden Street

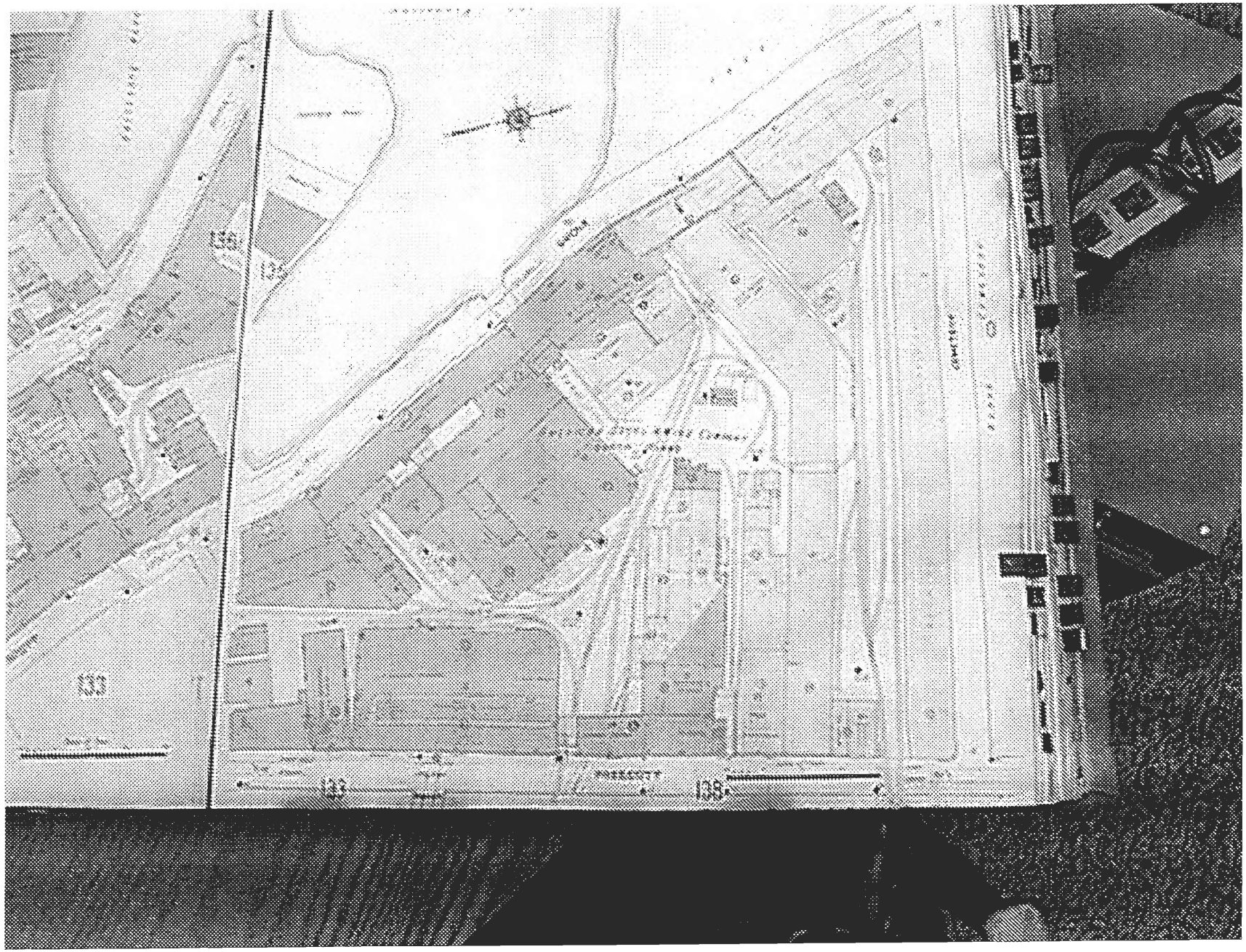


Figure 9 – Fire Insurance Map of the American Steel and Wire Company, Salisbury Pond and the Cemetery

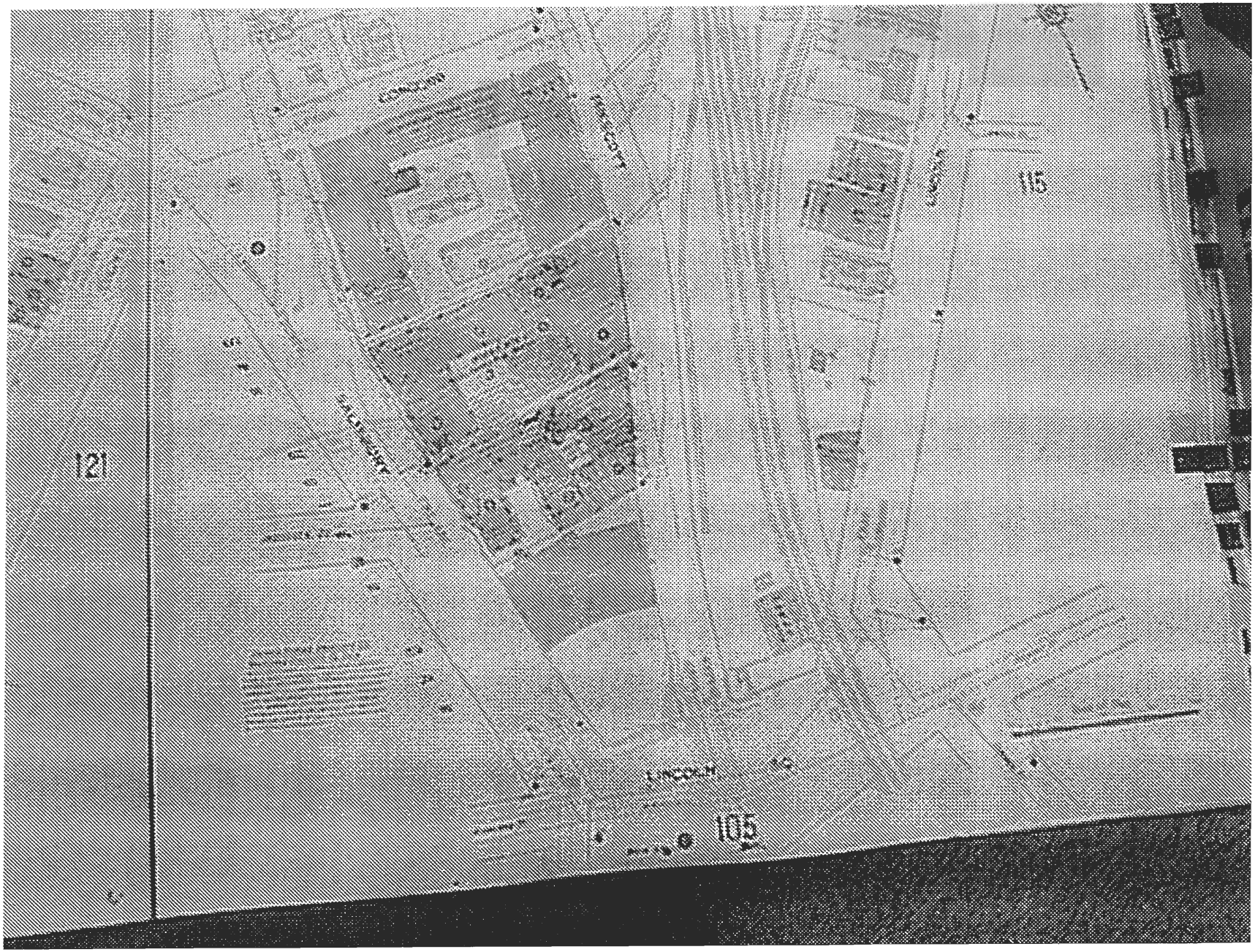


Figure 10 – Fire Insurance Map of Lincoln Square Salisbury Street and Prescott Street

2.1.4 Traffic

The traffic on Prescott Street is generated mainly by the local businesses and it is not a highly traveled road. The condition of the road might have an effect on how much traffic there is. The condition of the asphalt two-lane road is poor to fair. Potholes line the road on both sides and there are two sets of out-of-service railroad lines that cross the road. Prescott Street does not have very good drainage of rainwater, which over time will leak into cracks and cause damage to the subsurface pavement structure. Another factor of this road decay is the heavy truck traffic to the concrete mixing company and the other existing factories. The road does not seem to be designed to accommodate the high levels of strain received from the industrial traffic. All of these degrading road conditions are a nuisance to the daily travelers and a deterrence to any visitors of the area.

2.1.5 Railroad

Along the east side of the site at 85 Prescott Street, there are railroad tracks that run parallel to Interstate 290. The owner of the railroad tracks is the Providence and Worcester Railroad Company. The Providence and Worcester Railroad Company is a regional freight railroad operating in Massachusetts, Rhode Island, Connecticut and New York. The Company interchanges freight traffic with CSX at Worcester, MA and at New Haven, CT; with the Springfield Terminal Railway Company (formerly Boston and Maine Railroad) at Gardner, MA; with the New England Central Railroad (formerly Central Vermont Railway) at New London, CT; and with the New York and Atlantic Railroad (formerly Long Island Railroad) at Fresh Pond Junction (Queens), NY. It

operates four classification yards in Worcester, MA, Cumberland, RI, Plainfield, CT and New Haven, CT. Worcester, MA and Plainfield, CT also house equipment maintenance facilities. (www.massrail.com)

The Company began independent operations in 1973 and through a series of acquisitions of connecting lines has grown from 45 miles of track to its current system of approximately 545 miles. The largest double stack intermodal facilities in New England are operated by the P&W in Worcester Massachusetts, a strategic location for regional transportation and distribution enterprises.(www.massrail.com)

By agreement with a private operator, the Company also operates two approved customs intermodal yards in Worcester, primarily for the movement of container traffic from the Far East destined for points in New England. Several major container shipping lines utilize double stack train service through these terminals. P&W works closely with the terminal operator to develop and maintain strong relationships with steamship lines involved in international intermodal transportation. In 1998, the Company handled approximately 54,000 intermodal containers. The Company also generates investment income and income through sales of properties, grants of easements and licenses, and leases of land and tracks.(www.massrail.com)

P&W 's customers include The Dow Chemical Company, Exxon Corporation, Frito-Lay, Inc., General Dynamics Corporation, Getty Petroleum Marketing Inc., International Paper Company, Leggett & Platt, Incorporated, Mobil Oil Corporation, R. R. Donnelley, Stone Container and Tilcon Connecticut, Inc.(www.massrail.com)

The Company transports a wide variety of commodities for its approximately 150 customers, including construction aggregate, iron and steel products, chemicals, lumber,

scrap metals, plastic resins, cement, processed foods and edible food stuffs, such as frozen foods, corn syrup and animal and vegetable oils. In 1998, the Company transported approximately 30,500 carloads of freight.(www.massrail.com)

According to the P&W, the lines along I-290 are still active but it is not clear if any of the surrounding business use the railroads for importing or exporting their own products.

3.0 Site Evaluation

Evaluating the current site will help determine the criteria for a cleanup process that will have to be performed before new development can begin. There are numerous site cleanup regulations that must be followed today, to conform to the laws to help protect the environment. Figure 12 is an overhead view of the site today, including the buildings, and roads that surround it.

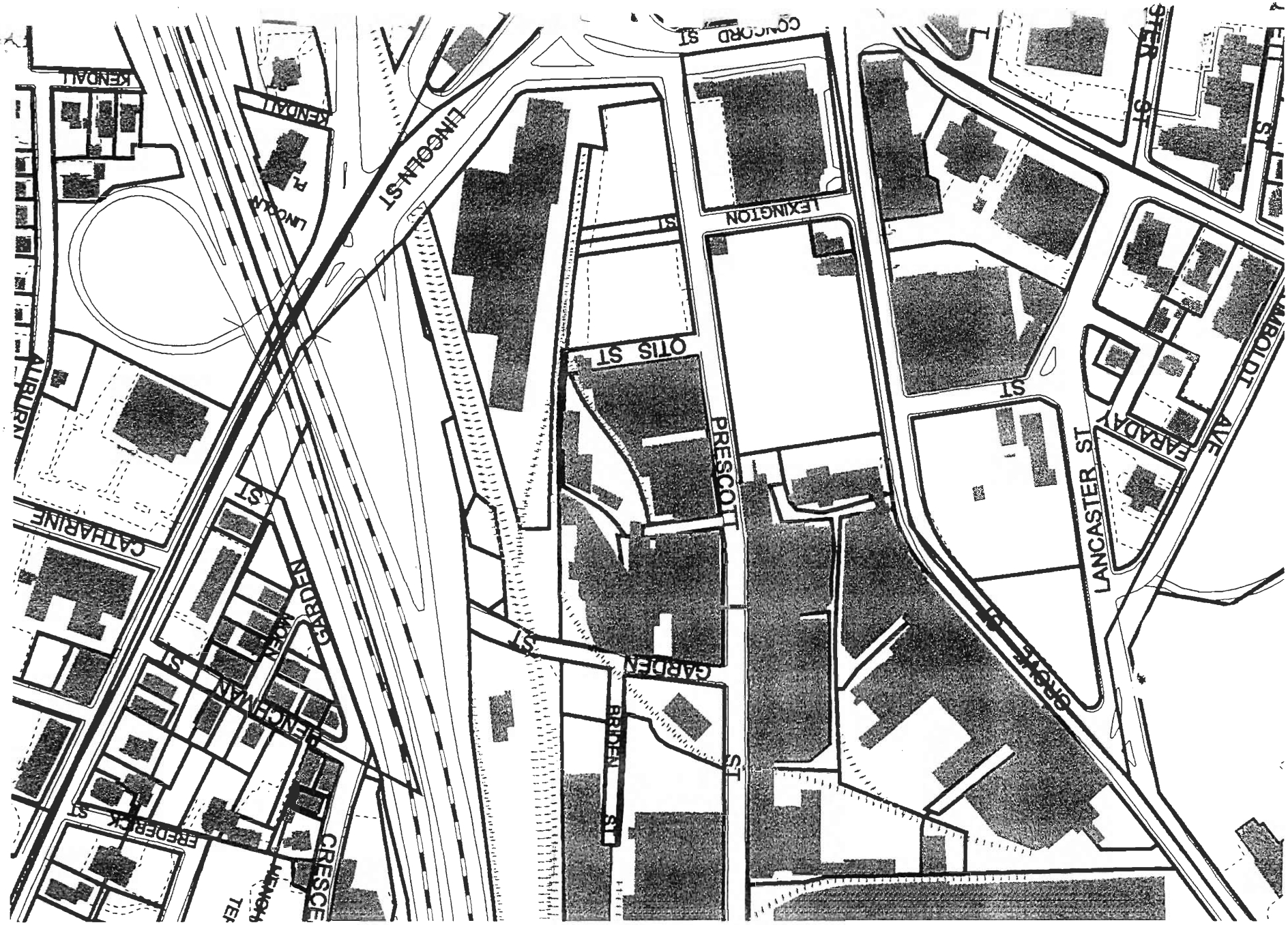


Figure 12 – Overhead of Existing Site and Buildings

3.1 Problems of the Site

Many changes have occurred to the site that is being evaluated, including new construction of buildings. In the past, for someone to construct a new building or to tear down, there were not specific rules or laws to follow to help protect the environment from pollution. Now there are new laws developed everyday to help preserve and protect land today. When dealing with a site that hasn't been developed in the past 30 years, there are many different regulations to follow today, leading to the discovery of many different problems the site contains. Recently, the Department of Environmental Protection has recognized "brownfields" and the hazard they pose to the Environment. Brownfields are determined to be the pollution of the groundwater that flows through the site. This is just one of the many problems that face the site today.

3.1.1 Brownfields

The cleanup criteria for a specific site is difficult to determine due to the fact that assumptions and expert opinions frequently must be relied upon and evidence often is lacking. In the past cleanup criteria were based on the specification of tolerable or acceptable health risks, mainly pertaining to the risk of human health. The 1976 Resources Conservation and Recovery Act (RCRA) and the 1980 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) recognize the issues of groundwater pollution and set standards for professionals to follow. Such standards include:

(1) cleanup to "background" levels;

(2) cleanup to levels established by the limits of detection

(3) cleanup to "non-detect" levels;

(4) cleanup to levels established by the capability of the best demonstrated available remediation technologies;

(5) cleanup to levels established by precedent, for example, Records of Decisions at Superfund Sites, decisions by regulatory authorities at similar sites, etc.'

(6) cleanup to existing standards or guidelines, for example, Maximum Contaminant Levels (MCLs) established in the Safe Drinking Water Act, Action Levels in the proposed RCRA Corrective Action Rule, etc.;

(7) cleanup to levels protective of potentially exposed individuals as established by a health risk assessment; and

(8) combination of the above. (Buonicore, 3)

3.1.1.1 Cleanup to Background Levels:

Throughout the United States, the U.S.G.S. evaluates the background levels of elements in soil. The goal pursued by environmentalist is to clean up the existing contaminated soil and groundwater and return the site to its previous condition before the contamination occurred. The specific definition of what constitutes background at a particular site is a matter of policy. When a "background" is defined, the next step is to determine whether a database exist for the contaminate or a new database is needed. Regardless of having the database, further analysis will be needed to update current files.

Through its research, the Environmental Protection Agency (EPA) has acknowledged the difficulty in defining background groundwater quality. The EPA has recognized groundwater quality as being the result of a dynamic natural system that

behaves in a semi-predictable way. The use of monitoring wells has helped determine components of groundwater in association with groundwater discharge. (Buonicore, 3)

It has been even more difficult to characterize background soil quality. Background groundwater samples can be taken from the same well, but the quality of the soil can vary with each sample even if taken close to one another.

A method that has been used in the study and research of background groundwater contaminate is geostatistical methodology. Statistical techniques are used for the spatial analysis of a variety of earth-related data. The extensive mathematical procedure of geostatistics allows professionals to estimate non-sampled areas, helping to reduce time spent in the field. The EPA has been promoting the use of computer software for environmental investigations. Such software packages include Geo-EAS (Geostatistical Environmental Assessment Software, EPA/600/4-88/033a, 1988), which the EPA recommends to use in spatial environmental data analysis, as stated in *Guidance for Data Usability in Risk Assessment* (EPA/540/G-90/008,1990). (Buonicore, 3)

3.1.1.2 Cleanup To Limits Of Detection

The limit of detection of a contaminate is a function of the capability of the instrument or the equipment being used in the testing; the cleanup criteria is set at this limit. Many states have developed a cleanup criterion using the detection limits as a benchmark to evaluate areas to determine if it is a risk to human health. (Buonicore, 4)

3.1.1.3 Cleanup To Non-Detect Levels

Cleanup to non-detectable levels means that contaminated soil and groundwater must be removed and replaced to satisfy the limits of detection for the hazardous substance involved. (Buonicore, 4)

3.1.1.4 Technology-Based Cleanup Standards

The technology explained earlier, promoted by the EPA, under the RCRA, has developed for site cleanup of certain hazardous waste. This helps determine an achievable level of cleanup. The most common technologies used for the cleanup of contaminated soil include:

- soil vapor extraction
- biological treatment
- chemical extraction
- dechlorination
- soil washing
- solidification/stabilization
- thermal desorption
- incineration
- vitrification

The most common technologies used for the cleanup of contaminated groundwater include:

- air stripping
- carbon absorption
- biological treatment
- oxidation
- physical/chemical treatment (Buonicore, 4)

3.1.1.5 Cleanup to Levels Established by Precedent

Precedents in the legal community have proven to be very useful and can become effective when negotiating specific cleanup criteria at a contaminated site. Although the

precedents are very helpful, they must be scrutinized carefully to make sure that the situations are the same. The most common precedent situations include:

(1) similar cleanups in the same state

(2) similar cleanups in other states, and

(3) Superfund site cleanup criteria as present in the Records of Decisions (RODs).

(Buonicore, 4)

3.1.1.6 Cleanup Established By Existing Standards and Guidelines

Many guidelines and regulations defining tolerable levels of groundwater and soil contaminates have been adopted by many federal and state agencies. At the federal level there are:

(1) the Maximum Contaminant Levels (MCLs) established under the Safe Water Drinking Act,

(2) the Action Levels defined in the proposed RCRA Corrective Action Rule,

(3) the Soil Screening Levels in the Superfund Program,

(4) PCB spill cleanup requirements in Toxic Substances and Control Act (TSCA) and

(5) Toxicity characteristic regulatory levels under RCRA (Buonicore, 4)

3.2 Site Cleanup Process and Standards

Clean up of a contaminated site begins with the notification of the Department of Environmental Protection (DEP). Criteria have been established for the method of notification and response necessary with different types of spills. Reportable Quantities (RQs) are set for sudden spills of oil and hazardous materials. For soil and groundwater contaminants there is Reportable Concentrations (RCs). The most frequent triggered notification criterion is the sudden spill of more than 10 gallons of a petroleum product. Additional notification triggers are in place for emergency and time-critical environmental conditions.

There are three types of notification thresholds: site conditions requiring notification within 2 hours, 72 hours or 120 days. Notifications within 2 or 72 hours are provided by telephone, with a written follow-up. Notifications required within 120 days of obtaining knowledge of a reporting trigger are provided in writing. All written notification must be submitted using a Release Notification Form (RNF).

3.2.1 Preliminary Response and Risk Reduction Measures

Once a release is reported to the DEP, Preliminary Response Actions must occur. The contaminated site must be cleaned up or classified as Tier I or Tier II within one year (See 4.2.1.2). When a site is classified an extensive assessment and cleanup program is setup. During this first year, multiple Risk Reduction measures are taken to address serious and localized problems, stabilize site conditions, and completely remediate smaller sites. An Immediate Response Action (IRA) is a mandatory risk reduction measure that is necessary at all sites with conditions requiring DEP notification within 2 or 72 hours. A Release Abatement Measure (RAM) is a voluntary measure used to clean

up small problems or reduce the effect of larger problems. All Risk Reduction measures require approval by DEP and notification to local officials.

3.2.2 Tier Classification/ Permitting

Any site not closed out within one year of the original notification must be scored using the Numerical Ranking System (NRS), and classified as a Tier I or II site. Tier I sites are the most severe and require direct supervision by a DEP staff engineer. Tier II sites undergo further work under the direction (not direct supervision) of a Licensed Site Professional (LSP). The sites classified as Tier I or II require a series of notifications to local officials and Legal Notices.

3.2.3 Site Characterization and Risk Assessment

The nature and extent of contamination must be determined at each site and tiered risk assessment approaches used for clean up. There are three main approaches:

- *Method 1* – the comparison of concentrations of site contaminants to generic risk-based cleanup standards developed by DEP for 111 common contaminants
- *Method 2* – modification of Method 1 based upon site-specific fate and transport considerations, also includes chemicals without set standards in Method 1
- *Method 3* – completely site-specific risk assessment

3.2.4 Reaching Closure

Once a state of no significant risk has been demonstrated or achieved then all notifications must be closed by filing a Response Action Outcome (RAO) document. Three classes of RAOs have been prepared:

- *Class A* – case where a cleanup was conducted

- *Class B* – case where a cleanup was deemed unnecessary
- *Class C* – case where a Temporary Solution was achieved because a Permanent Solution was not feasible

"In all cases, site cleanups must attempt to remove contamination to levels that achieve or approach a 'background' condition, to the extent technologically and economically feasible." In any cases where site cleanup was not achieved to the most protective use, a Notice of Activity and Use Limitation must be attached to the deed to document residual contamination.

If contamination originating in a neighboring or nearby property migrates onto adjacent property, the owner may be able to file for a Downgradient Property Status that will not require the owner to cleanup the problem for the time being.

3.2.5 Audits

All sites not overseen by direct DEP supervision are subject to audit. Until a site is audited by the agency, the opinions/findings of the Licensed Site Professional are considered to be valid and complete.

3.2.6 State Response Actions

If at anytime the party responsible for cleanup is either unable or unwilling to take the necessary actions, DEP can draw money from the state "superfund" to hire contractors to start and/or finish the job. DEP also has contractors on standby to respond to emergency and spill conditions, if necessary.

The above information is a summary of the Massachusetts Contingency Plan from the Bureau of Waste Site Cleanup website on the Massachusetts DEP webpage. The exact address is listed in the bibliography.

3.3 Evaluation of Site Clean-up

The Department of Environmental Protection (DEP) has established a standard for how clean is clean enough. They believe when a site has no significant risk to health, public welfare, safety or the environment then it is deemed to be clean. This standard must include current and reasonable foreseeable uses of a site and its surrounding area. In addition, the statute requires that a cleanup reach levels of oil and hazardous material that would exist in the absence of the disposal site if feasible. (MCP, 1)

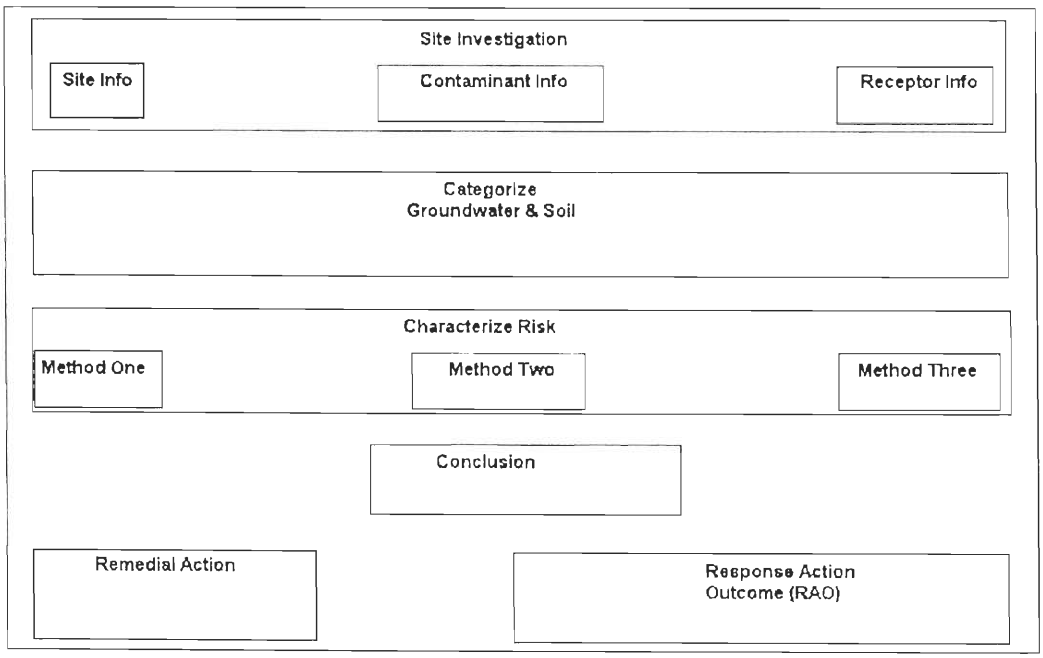


Figure 12 - Risk Characterization Chart

3.3.1 Risk Characterization

Risk Characterization is the process of describing and evaluating the risked posed by a site, and it is performed to determine whether or not further remediation is necessary. The 1993 Massachusetts Contingency Plan (MCP) provides three options for defining a level of "no significant risk" or "how clean is clean enough": **Method 1** uses clear numeric standards for more than 100 common chemicals in soil and groundwater; **Method 2** allows for some adjustments in these standards to reflect site-specific conditions; and **Method 3** allows cleanup requirement goals to be defined on the basis of a site specific risk assessment. With some limits, people conducting response actions can choose among these methods. (MCP, 1)

Risk characterization is also used to identify site conditions that would pose a significant risk to health, safety, public welfare or the environment if those conditions were to exist for even a short period of time. Such situations are considered to be Imminent Hazards under the MCP and Immediate Response Actions are required to address those conditions. (MCP,1-2)

3.3.2 Information Required for Risk Characterization

A thorough site investigation is essential to risk characterization. When describing site risks and determining their significance, the follow questions have to be answered: **Who** could be exposed to the contamination? All of the people and the environment which may be affected by contaminants from the disposal site are considered when identify the human and environmental receptors. The evaluation should focus on the people and habitats most likely to be present and exposed at the site, taking into consideration not only the current use of the land, by also its future use and the

surrounding area. Receptors can include children, adults, workers, animals, plants and wetlands.(MCP,2)

Where are the receptors coming into contact with the contaminants? The place where a receptor comes into contact with the oil or hazardous material is known as the exposure point. This is necessary because the concentrations of oil or hazardous material, and the risk resulting from exposure to these concentrations, are measured and evaluated at the exposure point, even if the exposure points are not at the disposal site itself. If the receptor is not physically at the disposal site, there must be a migration pathway for the oil or hazardous material to travel to the receptor. Common migration paths include groundwater and air. (MCP, 2)

What types of oil or hazardous material are present and what amounts? A systematic assessment of site conditions examines the amount and types of oil or hazardous material present at the disposal site. Air, soil, and ground or surface water are the environmental media most often examined. Contaminants may be located in one or more areas. The concentration of a contaminant at the location where receptor may contact the material is the exposure point concentration. (MCP,3)

How could the contaminants get to people or the environment? Contaminants can enter a human body, animal, or a plant in many different ways. The actual path of the contaminants enter the organism is called the route of exposure. Common routes of exposure include drinking contaminated water, or absorption through the skin or breathing in the contaminated air. (MCP, 3)

Conclusively, the risk that a disposal site presents depends on the types, quantities, and concentrations of the oil or hazardous material involved. Also the length

of time of exposure, the route of exposure, and the sensitivity of the receptor is considered.

The MCP establishes Soil and Groundwater Categories based upon the potential exposures, which may result from the presence of oil or hazardous material in the commonly contaminated media. Once the soil and the groundwater at a site have been categorized, applicable standards can be identified.

The three soil categories span a range from high exposure potential: Category S-1 soil (e.g. surficial soil in a residential neighborhood) to low exposure potential: Category S-3 soil (e.g. buried soil in a lightly used industrial area). The soil category is determined by four site-specific factors: accessibility of the soil, nature of receptors present, frequency of use of the site and the intensity of the use of the site. Because the three soil categories describe a range of potential exposures, these categories are mutually exclusive: soil is either S-1, S-2 or S-3.

The three-groundwater categories describe different exposures, which may result from contaminated groundwater. Category GW-1 Groundwater is a resource protected for its current or potential future use as drinking water. Category GW-2 Groundwater may act as a source of volatile material to indoor air. Category GW-3 Groundwater may discharge oil or hazardous material to surface water. As these categories describe different potential exposures, the groundwater categories are not mutually exclusive: all groundwater is assumed to eventually discharge to surface water and thus all groundwater is by definition GW-3. Groundwater may also be GW-1 and/or GW-2 depending upon site-specific factors. (MCP,3)

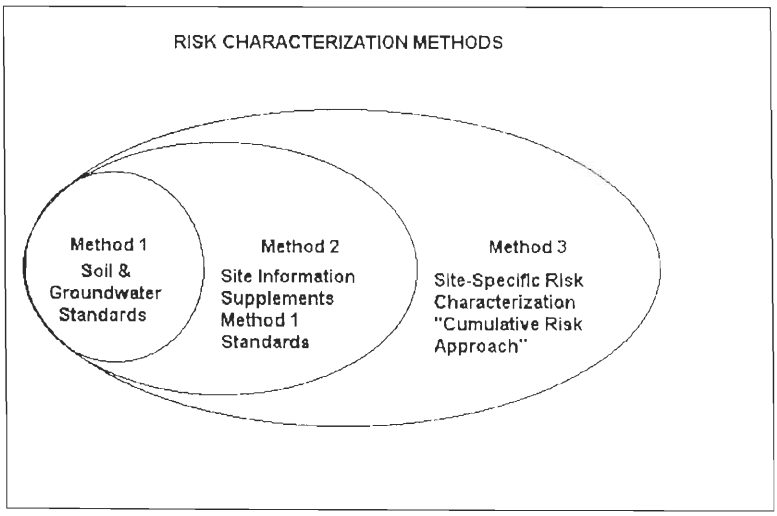
3.3.3 Evaluating Risks From a Disposal Site

Once the nature and the extent of the contamination is determined, all potential receptors identified and the soil and groundwater categorized, the risks are evaluated to answer the following questions:

1. How serious is the risk?
2. Is a remedial action required?
3. To what extent must the disposal site be cleaned up?

In the Contingency Plan, there are three different methods of risk characterization, so the complexity of the assessment can match the complexity of the disposal site. It is important to note that each method offers the same high level or protection to public health and that, with some limitations, any method may be used at a disposal site to

Figure 13 - Risk Characterization Methods



demonstrate that the site poses no significant risk of harm to health, safety, public welfare and the environment. (MCP,4)

3.3.4 Risk to Safety

Regardless of the three risk characterization methods used, the risk to safety is characterized the same way. Site conditions are evaluated to see whether they pose a threat of physical harm or bodily injury to people. Examples of safety risk are the presence of corroded drums containing oil or hazardous material, or the presence of explosive vapors. (MCP, 5)

3.3.5 Method 1 – Using Promulgated Standards in Soil and Groundwater

The MCP contains lists of soil and groundwater standards developed in a health-protective manner and corresponding to the groundwater and soil categories described previously. Once the groundwater and soil categories have been identified for a disposal site, the applicable standards can be read directly from the tables of Subpart 1. (MCP, 5)

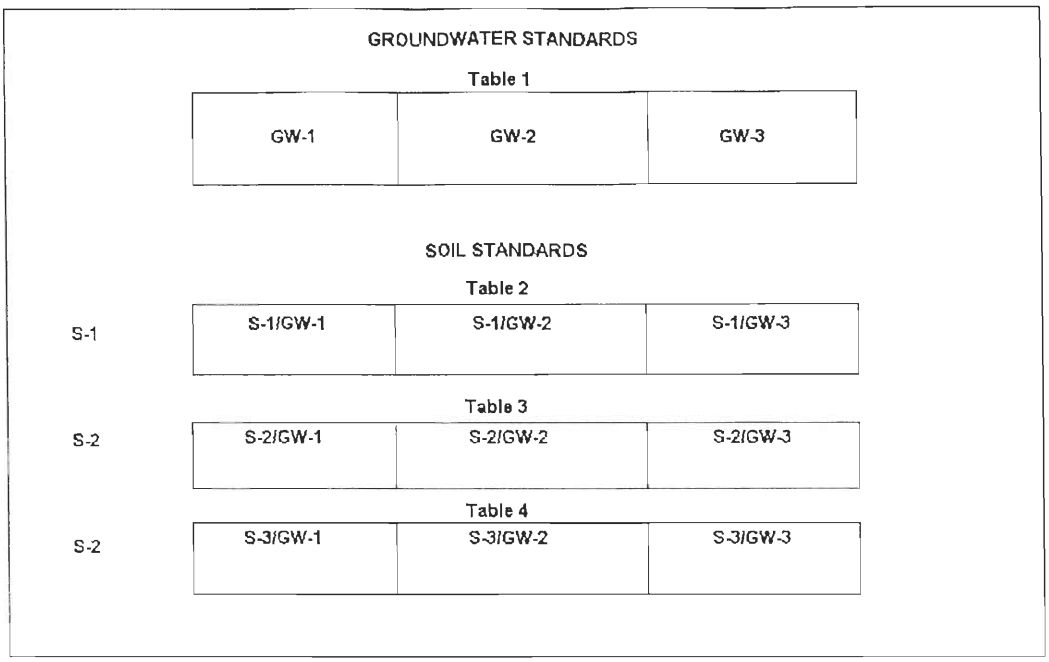


Table 1 – Groundwater and Soil Standards

The standards for groundwater categories GW-1, GW-2, GW-3 are listed in table 1 (310 CMR 40.0974(2)): when more than one groundwater category applies to a site all the applicable standards must be considered. The soil standards were developed considering both the risk associated with direct contact with the contaminated soil and the potential for the contaminants to leave the soil and contaminate the underlying groundwater. Thus, identifying the applicable soil standards depends upon both the category of the soil and the category of groundwater. Table 2 (310 CMR 40.0975(6)(a)) list the standards for category S-1 soils overlying GW-1, GW-2 and/or GW-3 groundwater. Tables 3 and 4 contain the applicable standards for soil categories S-2 and S-3 respectively. (MCP, 5)

The actual Risk Characterization under Method 1 is simply the comparison of the site conditions to the applicable soil and groundwater standards. If the concentration of an oil or hazardous material is greater than an applicable soil or groundwater standard then some form of remedial action is needed. If the concentrations reported at a site are locer than the applicable soil or groundwater standards, then a level of No Significant Risk exists, and no further remedial action is required. (MCP, 5)

3.3.6 Method 2 – Using Site-Specific Information To Complement The Method 1 Standards

In developing the Method 1 soil and groundwater standards, DEP made many health-protective assumptions about potential exposures and the movement of contaminants to ensure that the standards represent a level of No Significant Risk. For any given disposal site, investigations may reveal that the fate and transport models employed to develop Method1 standards overestimate potential risks. Under Method 2, site-specific information may be used to demonstrate and document that a concentration of oil and hazardous material, which exceeds an applicable Method 1 standard, poses No Significant Risk. (MCP, 5)

Examples of such Method 2 demonstrations include:

- The use of site-specific leaching models to document that residual soil levels will not result in an exceedance of an applicable groundwater standard;
- The use of site-specific volatilization models to document that groundwater contaminants will not result in unacceptable indoor air concentrations;
- The use of site-specific migration models to demonstrate that the groundwater will not pose a significant risk when it discharged to surface water.

Method 2 may also be used to fill in missing Method 1 standards. If DEP has not yet published a standard for a chemical of interest at a disposal site then the equations described in the regulations may be used to identify a standard for that chemical in a manner identical to the way DEP developed the original Method 1 standards. Such a Method 2 standard would be used in the risk characterization process as if it had been developed by DEP. (MCP, 6)

There are some Method 1 standards, which cannot be modified under Method 2. For example, groundwater protected as a current or potential source of drinking water must meet the promulgated GW-1 standards listed in table 1. Similarly, while some site specific information may be used to adjust the leaching-component of the soil standards, the results cannot exceed soil standards based upon direct contact exposures. These soil standards are listed in table 5 (310 CMR 40.0985(6)). (MCP, 6)

3.3.7 Method 3 – Site Specific Risk Assessment

Using Method 3 to characterize risk allows decisions about the need for remediation and the appropriate level of cleanup required to be made on a case-by-case basis. The risk of harm is evaluated independently by site. The risk of harm is evaluated by comparing current or expected exposures point concentrations to existing standards and by evaluating all current and foreseeable site-related exposures and comparing calculated cancer and non-cancer risks to risk limits promulgated in the MCP. (MCP, 7)

Potential negative health effects are divided into two categories: those which present an increased risk of developing cancer from exposure to any amount of a potential cancer-causing substance; and non-cancerous health effects (such as damage to the nervous system, liver or other organs) caused by intake of more than a threshold

amount of a contaminant. A threshold amount is the level at which adverse health effects may be expected to occur. (MCP, 7)

The Cumulative Receptor Cancer Risk is an estimate of how much a person's lifetime cancer risk is increased as a result of exposure to the contaminants, that is, the excess risk due to the contaminants from the site. The calculated Cumulative Receptor Cancer Risk is compared to a cumulative cancer risk limit of one-in-one hundred thousand (1 in 100,000). That means that an individual's exposure cannot increase his lifetime cancer risk by more than 1 in 100,000. Anything above this is considered to be a significant risk and any cleanup solution must reduce the excess risk below this level. This level is very strict, especially since in the U.S. today the risk of an individual developing cancer is 1 in 4. (MCP, 7)

The characterization of risk to public welfare considers factors such as the existence of nuisance conditions, loss of property value, and the loss of property use to determine whether the community in the vicinity of the disposal site has experienced significant adverse impacts to public welfare. This assessment also makes use of Upper Concentration Limits, which are chemical-specific concentrations (table 6, 310 CMR 40.0996(4)) used to characterize potential future risks to public welfare which may result from leaving high levels of untreated contaminants in the soil or groundwater. (MCP, 7)

3.3.8 Evaluating Potential Imminent Hazards

There are some site conditions which warrant immediate attention, including early notification to DEP and the implementation of an Immediate Response Action (IRA) Immediate response Action must be undertaken to address sudden releases of oil or

hazardous material, Imminent Hazards and other time critical conditions identified in the MCP. (MCP,7)

In the process of eliminating significant risk, the restoration of the disposal site to background levels is also needed. If feasible, the need to cleanup the site to the level which would exist in the absence of the disposal site. This is known as restoring the disposal site to background levels. (MCP, 8)

3.4 The Privatized Waste Site Cleanup Program

As of October 1, 1993, there have been new rules, which have turned the cleanup of contaminated sites in Massachusetts into a more private issue. The basic concept behind this approach is to use government resources in a more limited manner while still achieving a high level of environmental benefit. The program is broken into three important elements:

(1) *Comprehensive Regulations* – These regulations are the specifications that must be followed in order to evaluate and document site conditions and the necessary remedial activities. While the regulations state how clean a site must be, there are no specifications on how to show and/or achieve this level of cleanliness. Licensed Site Professionals decide this level of cleanliness on a case-by-case basis.

(2) *Licensed Site Professionals (LSPs)* – Licensed Site Professionals are required by the Massachusetts Contingency Plan to evaluate and then oversee the remediation of contaminated sites. A qualified, practicing LSP is a person that possesses a minimum number of years experience and/or specialized training and education in

environmental assessment and/or cleanup. In addition, the individual must follow specified standards of practice.

(3) *DEP Audit and Oversight Programs* – DEP performs four important oversight functions:

- Oversight of Immediate Response Actions – BWSC/NERO staff from both the Emergency Response Section and Risk Reduction Branch perform limited, short-term oversight of emergency and/or time-critical pollution situations. Once the sight is stabilized, any further action can be done solely by a LSP
- Tier IA Oversight – Sites that pose the worst, long-term threats to both the environment and people are called Tier IA sites.
- Audits – The agency does both random and targeted inspections and audits on assessment and cleanup activities at private sites not directly under DEP. These audits range from cursory and focused reviews, to formal, detailed evaluations of conducted activities.
- Enforcement – DEP penalizes those parties that fail to meet their regulations, and in doing so, hope to ensure better future results. The penalties include a Notice of Non Compliance to the issuance of orders and/or penalties, and in worse case scenarios, imprisonment and criminal penalties.

3.5 Qualification for the Brownfields Redevelopment Fund

- Project must generate jobs or contribute to the economic or physical revitalization of the area
- Project must result in a significant level of community benefit
- Funding must be necessary to make proposed reuse feasible
- Project must be located in an Economically Distressed Area (EDA)
- Project must not be eligible for funding under the oil cleanup fund
- Project proponent must not have caused or contributed to the release or have owned or operated the site when the release occurred
- Entities eligible for grants include: municipalities, redevelopment authorities, redevelopment agencies, economic development and industrial corporations, community development corporations or economic development authorities
- Priority projects can receive up to $2 million in assistance

3.5.1 Financing for Site Assessment

- 30% of all funds are earmarked for grants and loans for site assessments
- Public and private entities are eligible
- Maximum site assessment financing is $50,000
- Project must be in a Economically Distressed Area
- Some match is required (project specific)

3.5.2 Financing for Cleanup Actions

- Public and private entities are eligible
- Maximum cleanup financing is $500,000
- A match is required
- Project must be in a Economically Distressed Area

4.0 Alternative for Redesign of Site

Apart from recognizing the contaminates at the site location, different alternative solutions that the site could be developed into had to be determined. Each alternative was developed, keeping in mind the surrounding area and what the community had to offer. These ideas also included the conditions of the existing buildings and the to what extend would have to be taken to cleanup the site to levels safe to the public's welfare.

4.1 Design and Utilization of Existing Buildings

One alternative for the improvement of this area is to renovate the existing buildings and rent/sell the space to new businesses. All buildings would be evaluated and the feasible ones would be renovated to accommodate the new companies. Due to zoning restrictions there is a limit on what new businesses can enter the area; or the zoning could be changed. The area could be used for another type of manufacturing company or office space. This would limit the amount of brownfields cleanup required since the new uses would not be drastically disturbing the soil. With this plan the railroads may be used if a manufacturing company needed them for material transporting but otherwise would be unaffected. Traffic flow in the area would also remain relatively the same. There is currently some industrial truck traffic and minimal car traffic. With the redevelopment of the existing buildings a manufacturer would have some truck traffic and an office building would bring a moderate flow of cars. The location of the existing roads would be suitable yet the condition of the roads would need to be improved. The location of the underground brook would not be affected or incorporated with this idea.

A redevelopment of the existing buildings will not have a dramatic effect on the newly constructed Courtyard by Marriott. The incoming businesses would not attract a large increase in patrons for the hotel, but they would also not distract people as much as the current run down factories.

A renovation of the existing buildings in the Prescott Street area would be beneficial to the urban renewal of Worcester. New businesses would help improve the area economy. Buildings with active business are more attracting than vacant rundown buildings.

4.2 Worcester Polytechnic Institute – Alternative Design

Currently, Worcester Polytechnic Institute has state of the art facilities where the gymnasium, football/soccer/field hockey field, and the outdoor track are concerned. The fitness center, while not expansive or overly attractive, serves its purpose and provides an adequate place for the student body and the faculty to work out. Likewise, the softball and baseball fields are functional. Although neither is extremely high quality, the fact remains that the WPI baseball and softball teams both have fields to call their own.

The swimming and diving team, on the other hand, is not so fortunate. With the current state of the pool at WPI, not being regulation length and having no diving board, the team is forced to travel to Clark for its own home meets. And, while the baseball and softball fields are usable, the indoor batting cage is hardly adequate for both teams. It would benefit both teams to have separate batting cages, as the equipment for both teams is different and the time frame for which both teams would utilize the cage is similar. While it is not realistic to have a golf course at WPI, it would surely benefit the golf team to have golf nets for the athletes to practice their swings year round.

The varsity teams are not the only teams at WPI, which are suffering due to lack of equipment on the WPI campus. The hockey team, like the swim team without their pool, is without a rink. A hockey rink that could turn into tennis courts in the summer would be beneficial on many fronts. It would give our hockey team, a club sport, a place to play and practice. It would also give the area more tennis courts for summer use. The tennis courts/hockey rink would provide a place to put an indoor track, another facility that the college is currently lacking. The indoor track in Alumni Auditorium is too small and the baseboards are warped and slanted. A new indoor track would provide an athlete the opportunity to run in the winter without having to do 3001 laps while running on a hill.

If WPI were to invest in a multi-sports complex in the area of 85 Prescott Street, it would seem very beneficial. At the moment, WPI is constructing a Student Center located behind Higgins Laboratory and between Olin Hall and Higgins House. It also has plans, when the new student center is complete, to build a new academic building located on the east side of Boynton Hall and south of Gordon Library. It also plans on building a parking garage over the existing paved parking lot. After these structures are built, WPI has built on almost every available piece of property it owns. If WPI wanted to build another building, they would have to purchase more land somewhere else in the area.

The need for a sports complex in the city would not only give "advertisement" for WPI on Interstate 290, but it could give back to the community if it allowed the city to use the facility. The need for a hockey rink in the city is very great, WPI's club hockey team must travel 20 minutes down Route 9 to North Star Arena, and Assumption College has to travel also. The price for ice time at any rink is very costly and WPI could charge

that same amount to help pay for operating expenses. But the hockey rink would not be the only thing to be built. A regulation size swimming pool could take place of the existing out of date pool. Other facilities could be incorporated in this new building, as talked about previously.

At the site, there already exist two large parking lots that could accommodate parking for the new complex and the Institute could enjoy the easy assess off the interstate for visiting teams. The Marriott Hotel is located conveniently across the street that could house visiting teams. The distance from the main campus is no more then 1 ½ miles away; that would allow students and faculty easy assess. The Institute could also run shuttle busses at peak times to accommodate everyone using the complex.

With the new buildings already being planned or constructed, a new sport complex, if built, would help attract new freshmen recruits to the Institute and increase enrollment.

4.3 Cemetery Alternative

The cemetery alternative for the Prescott Street Brownfields Project is two-fold. First, we would clean out the entire area in question, leaving no building or business intact. After successfully dealing with the brownfields, we would then turn the entire area into a park. We would landscape the entire area with green space, trees, and plant-life while leaving the railroad intact. This alternative would also include a bike path for the use of both pedestrians and bicycles and a play area for children. In this green space, we would allow area for billboards that can be seen from Interstate-290 that would advertise the best our city as to offer.

The other objective in this alternative would be to extend the cemetery that now exists at the end of Prescott Street. We would extend this cemetery all the way to I-290,

in conjunction with the rest of the green space from the park. This extension would provide a great service to the city of Worcester at a minimal cost, due to the minimal cleanup and care this area would need.

This alternative would serve many of the needs we established as goals for this project. First, the green-space, with its billboards, would provide an excellent visual aide to get people into the city. Second, in leaving the railroad intact and extending the cemetery we would keep some of the history of the city intact in this area. Also, the cleanup costs would be minimal, as would the price to keep it in function.

4.4 Best Alternative

Using the background information and the objectives set forth at the beginning of the project, it was determined that the best alternative for renovating the Prescott Street Corridor would be to build a sports complex for Worcester Polytechnic Institute. Of all three of the possibilities, the construction of a sports complex would best fulfill the needs for the project and best benefit the city of Worcester.

Foremost, a sports complex off Interstate-290 would meet the criterion that the renovation must attract the attention of travelers on the highway and entice them into the city. Seeing a brand new field house and tennis courts from the interstate would help bring people off the highway and into the city. Also, a place to workout would offer the current residents of Worcester a chance to interact with one another. Therefore, the building of a sports complex for, but not limited to, the student athletes at WPI would create movement into and within the city of Worcester.

Another ideal that would be met by the establishment of a sports complex would be the beautification of the site. A brand new complex would be in stark contrast to the

current, old buildings that now occupy the Prescott Street Corridor. The site would be impressive to behold from both the interstate and the city.

Involving WPI in the renovation, and keeping the railroad intact, will insure that some of the history of the city will remain in the site. Worcester Polytechnic Institute is a prestigious collegiate institution rich in history. The railroad that is currently running through the site has deep roots in history as well. With both of these factors involved the site is insured historical value.

Combining all these factors together led us to determine that building a sports complex for WPI would be the best possible renovation to the Prescott Street Corridor and thus is our recommendation for the city of Worcester.

5.0 Conclusions

The purpose of this IQP was to take a section of downtown Worcester, the Prescott Street Corridor, and renovate the current site into something more beneficial to the city. The site is quite expansive and, more importantly, quite visible from Interstate-290. This makes the Prescott Street Corridor an important and influential part of the city of Worcester in terms of bringing more people into the city, the most crucial aspect of this project.

The first objective of this project was to identify those needs of the site that we found to be necessary and imperative to the renovation of the site. After examining several different necessities, it was determined that the most important factor the site must contain after renovation was the ability to bring people into the city Worcester while providing opportunities for the city's current residents as well. Bringing people into the city would necessitate that the site be visually pleasing, especially from Interstate-290. We also decided that it would be beneficial to the current residents of the city if we could keep as many historical aspects of the site intact as possible. It was concluded that these goals were the most important and that our site would be built upon as many as possible.

Once we knew what the site must include, we started researching the different topic areas that were relevant to our project. This included urban renovation, brownfields, the site conditions and its history, and the interests of potential buyers. All of the information was gathered and combined with the goals and personal views for the site and several proposals for the site were developed. After comparing each of these alternatives to both the qualifications that were necessary for the site and the background information, three choices were determined as strong possibilities: a sports complex for

Worcester Polytechnic Institute, a cemetery extension and park, and the complete renewal of all the buildings. The first alternative offered both the ability to bring people into the city and the ability to provide athletic opportunities to the city's residents. It also would be visually pleasing and help retain the city's historical significance by advertising one of its oldest and most distinguished colleges. The second alternative would be pleasing to the eye with all its open space and green grass contrasting the buildings around it. It would tell travelers along the interstate that there was more to the city than business. It would help retain the historical value of by keeping and enlarging the cemetery. Each of the three alternatives was explained in detail, with both its strengths and weaknesses cited.

Realizing that the main objective was to bring people off Interstate-290 and into the city, it was determined that the idea of turning the Prescott Street Corridor into a sports complex for WPI would be the most beneficial alternative. Since the sports complex would not be limited to the student athletes at WPI, people could come off the streets, whether it be within the city or not, and have a place to workout, play tennis or run. A brand new complex would be a very pleasing site to travelers passing by on I-290. Through the advertisement and involvement of WPI, the history of the city would be brought into both the site and the project. For all of these reasons, it was concluded that the best possible renovation for the Prescott Street Corridor would be a sports complex for Worcester Polytechnic Institute.

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Appendix A - Contacts

- Craig Blais

  Worcester Business Development Corporation

- John Miller

  Worcester Polytechnic Institute – Plant Services

- Ken Foley

  Department of Environmental Protection

- Cathy O'Brien

  Marriott Hotels, Worcester – Hotel Manager

Appendix B - Interviews

Kenneth Foley – Department of Environmental Protection

We met with Mr. Foley at the Central Regional Office of the Department of Environmental Protection located in Worcester. Mr. Foley demonstrated to us the use of the DEP website and all the information that was available. Also he showed us how to fill out Site/Reportable Release Look Up forms that would allow us to access information that DEP had on file at their office. All the information provided to us were records of any work that had been completed on a particular site including any data colleted, mandatory forms of site evaluations, and permits that were required. This information helped to determine the past history of the site and get an understanding of what steps needed to be taken to begin a site cleanup. All the information that we requested was public information. We visited DEP twice to look at files that we requested and Mr. Foley was very helpful each time.

Cathy O'Brien – Marriott Hotel

We meet with Cathy O'Brien who is the manager of the Marriott Hotel located on Grove Street in Worcester. We asked her why Marriott decided to build a hotel in this area and if they had any thoughts about what they would like the surrounding area to develop to. Mrs. O'Brien explained that Marriott wanted to be the first company to enter the area in hopes that the surrounding community will began to develop. She didn't have any specific suggestions for the use of the surrounding buildings. We asked if Marriott would be interested in advertising along Interstate 290, but because they have just established themselves in the area that they would rely on their national headquarters for

advertisement at this time. Mrs. O'Brien also expressed to us how expensive advertising on billboards is and that is another reason why they are relying on their headquarters. She did mention to us that they will think about advertising locally sometime in the future. Mrs. O'Brien was very helpful and she was pleased that something was being done with the surrounding area.

John Miller – Director of Plant Services for Worcester Polytechnic Institute

We met with John Miller to ask him if WPI had any plans to develop in the area of Prescott Street. We figured that WPI could expand in that area with a sports complex or an academic building, or just to advertise the Institute off of Interstate 290. When we asked him if WPI had shown interest, he told us not at the moment because of all the new construction that is taking place on campus now. He was however able to provide us with some overhead maps of the area that showed the buildings and there sizes, along with roads, railroads, etc. Mr. Miller was very helpful with our project and encouraged us to meet with him again if we had any more questions.

Several phone calls were made to Craig Blais of the Worcester Business Development Corporation and to Katz Reality but our messages were never returned.

Appendix C - SUMMARY OF THE BROWNFIELDS ACT: CHAPTER 206 OF THE ACTS OF 1998

"An Act Relative to Environmental Cleanup and Promoting the Redevelopment of Contaminated Property"

On August 5, 1998 Governor Cellucci signed into law the "Brownfields Act," establishing new incentives to encourage parties to clean up and redevelop contaminated property in Massachusetts. This Act will provide liability relief and financial incentives to attract new resources for these properties, while ensuring that the Commonwealth's environmental standards are met. Major features of the Act are summarized below.

A. LIABILITY RELIEF

1. **"Innocent" Owners and Operators:** Ends liability for "innocent" owners and operators once they meet DEP's cleanup standards for oil or hazardous material releases. Defines "eligible person" as an owner or operator who did not own or operate the site at the time of the release and who did not cause or contribute to the contamination at the site. Once a permanent cleanup or remedy operation status is achieved, an eligible person is protected from Commonwealth claims for response action costs and natural resource damages and from claims by third parties for contribution, response action costs and property damage under c. 21E and property damage under common law.
    - The owner must cleanup soil contamination within his property boundaries to DEP standards. If the property includes the source of groundwater or surface

water contamination, the owner must clean up the water-borne contamination to DEP standards.

- The liability protection extends to subsequent property owners who maintain the site's clean status or on-going cleanup remedy.
- An eligible person who starts a cleanup but transfers the property before completion of the cleanup is protected from liability once a subsequent eligible person achieves a permanent solution or remedy operation status, as long as the initial eligible person complied fully with c. 21E and its regulations while he owned or operated the site.

2. **Downgradient Property Owners:** Exempts certain owners and operators from liability for contamination that has migrated onto their property. Owners and operators are eligible if they have no connection with the property that contains the source of the contamination and they did not cause or contribute to the contamination. If the source is unknown, the owner or operator has a defense to liability, rather than an exemption. The exemption or defense is available as long as the owner or operator notifies DEP of the release, provides access to people who clean up, prevents exposure to the contamination, controls risks from imminent hazards, does not impede or interfere with the performance of response actions and does not exacerbate the release of oil or hazardous material.
3. **Tenants:** Exempts certain tenants from operator liability if their tenancy began after the release was reported to DEP and they did not cause or contribute to the contamination. To maintain this exemption, the tenant must provide access to the site (or the portion it controls) to people who are cleaning up, prevent exposure to the

contamination, control risks from imminent hazards, and contain any further release from a structure or container under its control. If the tenant uses oil or hazardous materials similar to those found on the site, the tenant would need to show that he has not contributed to the contamination.

4. **Redevelopment Authorities and Community Development Corporations (CDC):** Exempts redevelopment agencies and authorities, CDCs and Economic Development and Industrial Corporations from liability as long as the acquire the property after August 5, 1998, did not cause or contribute to the contamination, notify DEP of the release, provide access to people who are cleaning up, prevent exposure to contamination, and take immediate response actions where needed. To maintain this exemption these agencies must act diligently to divest themselves of the property. The agencies are retroactively exempted from liability for sites acquired before August 5, 1998, provided that they meet the above requirements and notify DEP of any releases on these sites before the end of a six-month amnesty period that will be established by DEP.
5. **Secured Lenders:** Expands and clarifies the existing exemption. Replaces the "participation in management" liability standard with a causation standard and deletes the 5-year limit on the exemption after the secured lender takes ownership or possession of the property. Clarifies duties required to maintain the exemption after taking ownership or possession of contaminated property (e.g. by foreclosing): lenders have to prevent exposure to oil or hazardous materials, provide access to parties conducting response actions, respond to imminent hazards and substantial release migration conditions, and act diligently to divest. Lenders also must provide

notice of contamination to DEP and to prospective buyers prior to a public foreclosure auction.

6. **Governmental Bodies or Charitable Trusts:** Exempts to governmental bodies or charitable trusts who hold property restrictions created for the public benefit pursuant to c. 184, section 32 (conservation, agricultural preservation, watershed preservation and affordable housing restrictions).
7. **Activity and Use Limitations (AUL):** Protects owners and operators from liability for future violations when their permanent solution or remedy operation status includes an AUL and they transfer the property to a new owner. If a violation of the AUL occurs after transfer, the former owner would be relieved from liability to the Commonwealth under c. 21E and to third parties for contribution, response action costs for property damage party liability relief is not available to owners or operators who have cleaned up pursuant to RCRA and CERCLA, who were subject to outstanding administrative or judicial enforcement actions when they transferred the property, or who failed to record an AUL in accordance with c. 21E and its regulations.
8. **Contribution Protection:** Clarifies the existing contribution protection provisions regarding notice and matters addressed in the settlement. The legislation also changes the provision to provide contribution protection from any person who has had an opportunity to *comment on* the settlement instead of any person who has had an opportunity *to join in* the settlement.
9. **Brownfields Covenant Not to Sue:** Establishes a "Brownfields Covenant Not To Sue" for parties who are redeveloping contaminated properties and do not qualify for

the statutory liability relief described above. Priority for these covenants is given to projects in the 15 municipalities with the highest poverty rates, second to projects located in other Economically Distressed Areas (EDA), and finally to sites in all other municipalities. Under this provision, the party who does the cleanup and redevelopment can enter into an agreement for liability relief from the Commonwealth and third parties under Chapter 21E and for property damage under common law. The project must contribute to the economic or physical revitalization of the community in which it is located. The Attorney General's Office will write regulations to implement this program.

B. FINANCIAL INCENTIVES

1. Redevelopment Access to Capital

Overview: The purposed of the Redevelopment Access to Capital (RAC) program is to encourage private sector lending on contaminated sites throughout the Commonwealth. The program, administered by the Massachusetts Business Development Corp. (MBDC), is designed to address lenders concerns that (1) cost overruns incurred during cleanup might impede the borrower's ability to repay a loan; and (2) contaminated land is "impaired collateral" with a reduced value.

The program will back private sector loans with environmental insurance to ensure that the cleanup is completed, the loan is repaid and the collateral is restored to its "clean" value. The environmental insurance would be used to keep projects running. However, when the insurance is not adequate to address unanticipated environmental problems, RAC loan guarantees would be used to pay off the loans.

Program Funds: $15 million appropriation

Eligibility: The RAC program assistance is available to borrowers throughout the state who borrow from "participating Massachusetts lenders" (lenders who have signed a participation agreement with MBDC) to fund a site assessment or cleanup at a 21E site in Massachusetts is eligible. The borrower does not have to be an "innocent" party. The program is available for loans on any contaminated site located in the Commonwealth.

Implementation: The borrower and lender will be required to contribute equal amounts (points) to the RAC reserve fund. The State, through, MBDC, will make a matching contribution to the reserve fund. The reserve fund will purchase environmental insurance for each project, reducing insurance costs by pooling policies into a portfolio. The insurance will be used to fund unanticipated environmental costs and preserve the borrower's ability to repay the bank. If unanticipated environmental costs are so large that the project cannot be completed, the fund will pay off the loan.

MBDC Contact Person: Peter Hollingworth (617) 350-8877

2. Brownfields Redevelopment Fund

Overview: The Brownfields Redevelopment Fund (BRF) is administered by MassDevelopment to provide low-interest loans and grants for site assessment and cleanup in "Economically Distressed Areas" (EDA). EDAs include all **Economic Target Areas** (ETAs), areas the meet the criteria for ETA designation, but have not been formally designated, and sites of former manufactured gas plants.

Program Funds: $30 million appropriation. 30% of all BRF loans and grants must be used to fund site assessments.

Maximum Loan/Grant Per Project:

- Site assessments - $50,000 (Note: Any applicant who receives funding for a site assessment and does not proceed with the project must transfer the site assessment results to DEP).
- Cleanup - $500,000
- Priority projects - $2 million

Eligibility:

- Proposed projects must be located in EDAs and must result in significant economic impacts in terms of new jobs or contribution to the economic or physical revitalization of the areas in which they are located.
- The BRF assistance must be necessary to make the project financially feasible.
- Applicant must be: (1) an "innocent" owner or operator or third party pursuant to Chapter 21E with respect to the assisted site, and (2) cannot be subject to any outstanding administrative or judicial environmental enforcement action with respect to any property located within the Commonwealth.

Funding Categories:

(a) Grants

- Eligibility is limited to municipalities, redevelopment authorities and agencies, economic development and industrial corporations, community development corporations, and economic development authorities.
- Grant requires 20% matching funds from applicant.

(b) Loans

- The applicant must provide matching funds in accordance with BRF regulations.

(c) Priority Projects

- Priority projects are designated by the MassDevelopment. Eligibility for priority project designation is limited to projects that have municipal financial support in the form of a grant, loan, or abated property taxes.

MassDevelopment Contact Person: Anne Marie Dowd (617) 451-2477

3. Brownfields Tax Credit

Overview: The Brownfields Tax Credit is designed to encourage private sector investment in the cleanup of contaminated sites in Economically Distressed Areas. A tax credit of 25% of cleanup cost will be available upon completion of the cleanup. A larger tax credit of 50% will be allowed for a more thorough cleanup, providing an incentive to go beyond minimum cleanup requirements.

Eligibility:

- The taxpayer must be an "eligible person," (an owner or operator who did not own or operate the site at the time of the release and who did not cause or contribute to the contamination at the site.)
- Any taxpayer who owns or leases a contaminated site for business purposes.
- The site must be located in an Economically Distressed Area.
- The taxpayer must complete a cleanup on the site (submit a Response Outcome Statement or Remedy Operation Status document) prior to claiming the credit.

Allowable Tax Credit:

- A credit of 25% of the cleanup costs is allowed for a cleanup that achieves and maintains a permanent solution or remedy operation status that relies on an Activity and Use Limitation (AUL).
- A credit of 50% of the cleanup costs is allowed for a cleanup that achieves and maintains a permanent solution or remedy operation status that makes the site safe for unrestricted use (i.e., does not rely on an AUL).

Limitations:

- Costs must be incurred between August 1, 1998 and January 1, 2005.
- Cleanup costs must be greater than 15% of the assessed value of the property prior to remediation.
- The site must be reported to the Department of Environmental Protection.
- A credit may not be taken if the taxpayer received financial assistance from Redevelopment Access to Capital Program or the Brownfields Redevelopment Fund.

Carry Over Provision: The tax credit can be carried over for 5 years.

Recapture Provision: If the taxpayer does not maintain the permanent solution or remedy operation status during his/her term of ownership or tenancy, he/she must pay back the difference between the credit taken and the credit allowed for maintaining the remedy (calculated by multiplying the original credit by the ratio of the number of months the remedy was maintained over the number of months of useful life of the property).

Massachusetts Department of Revenue Contact Person: Lillian Rosario (617) 626-3264

C. OTHER FEATURES

1. **Penalties:** Increases penalties for failure to notify of oil releases, establishes new penalties for failure to maintain a permanent solution, or remedy operation status, or failure to comply with the terms of an AUL.
2. **EDAs:** Provides targeted liability relief and financial incentives for projects located in "Economically Distressed Areas" (EDA). EDAs include all **Economic Target Areas** (ETAs), areas that meet the criteria for ETA designation but have not been formally designated, and sites of former manufactured gas plants.

3. **Municipalities/Back Taxes:**
    - Amends municipal exemption from liability for tax foreclosed contaminated property, by deleting the requirement that municipalities divest of the property within five years of the tax taking.
    - Allows municipalities to enter into an agreement with an "eligible person" to abate back taxes, interest and penalties at contaminated commercial or industrial sites.
4. **Technical Corrections:** Makes corrections to c. 21A, section 19 (Licensed Site Professionals), and c. 21E.
5. **Audits:** Requires DEP to conduct targeted audits of all sites with AULs, requires DEP to develop standards to ensure that AULs are prepared and implemented in the same manner as the other real estate instruments.
6. **Office of Brownfields Revitalization:** Establishes a new "Office of Brownfields Revitalization," which is charged with coordinating and developing a Massachusetts

Brownfields Strategy, assisting with brownfields covenants not to sue, and assisting with the Brownfields Redevelopment Fund.

7. **Regulations:** Requires participating agencies (DEP, MassDevelopment, Dept. of Revenue, the Attorney General's Office) to promulgate needed regulations within one year of the effective date of statute.
8. **Study on Brownfields Trust Fund:** Requires the Legislature's Joint Committee on Natural Resources and Agriculture to conduct a study of the "Brownfields Trust Fund", as a vehicle through which PRPs could make contributions to gain protection from future liability.
9. **Other Funding (available for expenditure until 6/20/01):**
    - DEP: $10 million for conducting targeted audits of all sites with AULs, increased oversight and training of LSPs, training for DEP staff, and increased inspection and enforcement of AULs.
    - A.G.'s Office: $2 million for implementation of the Brownfields Covenant Not to Sue Program.

For More Information:

Massachusetts Department of Environmental Protection
Sarah Weinstein, Acting Deputy Assistant Commissioner, Bureau of Waste Site Cleanup – (617) 292-5820
Barbara Kessner Landau, Brownfields Coordinator – (617) 556-1193
Margaret Stolfa, Acting Deputy General Counsel – (617) 292-5922
Massachusetts Department of Economic Development
Todd Fernandez, General Counsel – (617) 727-8380

Note: This summary highlights the major features of the Brownfields Act. For the full obligations and benefits, please review the full text of the Act. This summary should not substitute for your own review and legal interpretation of the Act.

Appendix D – Site/Reportable Release Look Up

Bureau of Waste Site Cleanup

Site/Reportable Releases Look Up

RTN: allows you to retrieve sites by Release Tracking Number.

Site Name / Location Aid: allows you to retrieve sites by entering a Location Aid/Site Name keyword (I.e., "gas", "station", "WR Grace").

Enter One or More Keywords* for the Search:
RTN:
Site Name / Location Aid:
Street:
City:
Status:
Chemical Type:

SEARCH

Street: allows you to retrieve sites by part of or complete street address (i.e., "101 E.Main St." or just "Main St.").

Status: allows you to retrieve sites by current compliance status. A pick list is available (I.e., "RAO", "Tier 1A").

City: allows you to retrieve sites by city or subtown. A pick list is available.

Chemical Type: allows you to retrieve sites by Chemical type (Oil or Hazardous Material, or both). A pick list is available.

Location: Link through BWSC home page: **www.state.ma.us/dep/bwsc** or directly: **www.state.ma.us/dep/bwsc/sites/report.htm**

Appendix E – Glossary

AST – Above Ground Storage Tanks

ASTM – American Society for Testing and Materials

AUL – Activity and Use Limitations

BRF – Brownfields Redevelopment Fund

CDC – Community Development Corporation

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

CERCLIS – Comprehensive Environmental Response and Liability Information System

DEP – Department of Environmental Protection

EATs – Economic Target Areas

ECA – Economically Distressed Area

EDIP – Economic Development Incentive Program

EOA – Economic Opportunity Area

EPA – Environmental Protection Agency

ESA – Environmental Site Assessment

Geo-EAS – Geostatistics Environmental Assessment Software

IRA – Immediate Response Action

LSP – Licensed Site Professionals

LUST – Leaking Underground Storage Tanks

MA DEP – Massachusetts Department of Environmental Protection

MBDC – Massachusetts Business Development Corporation

MCLs – Maximum Contaminant Levels

MCP – Massachusetts Contingency Plan

NRS – Numerical Ranking System

OHM – Oil and/or Hazardous Material

P&W – Providence and Worcester railroad

PRA – Preliminary Response Action

RAC – Redevelopment Access Capitol

RAM – Release Abatement Measure

RAO – Response Action Outcome

RCRA – Resources Conservation and Recovery Act

RCs – Reportable Concentrations

RNF – Release Notification Forms

SHWS – State Hazardous Waste Site

TSCA – Toxic Substances and Control Act

U.S.G.S – United States Geological Survey

USTs – Underground Storage Tanks

USX – United States Steel

WBDC – Worcester Business Development Corporation

WPI – Worcester Polytechnic Institute

Appendix F – Pictures

Picture 1 – Furniture warehouse

Picture 2 – Furniture warehouse

Picture 3 – Storage space

Picture 4 – Old Supply Company

Picture 5 – The Massachusetts Lottery Building

Picture 6- New England Plating Company

Picture 7 – Behind the 2 furniture warehouses

Picture 8 - Paper World Party Supplies

Picture 9 – Behind first furniture warehouse

Picture 10 – Behind the storage space building

Picture 11- Alleyway between buildings

Picture 12 - New England Plating Company

Picture 13 – Demolished building adjacent to the lottery building

Picture 14 – Providence & Worcester Railroad Tracks

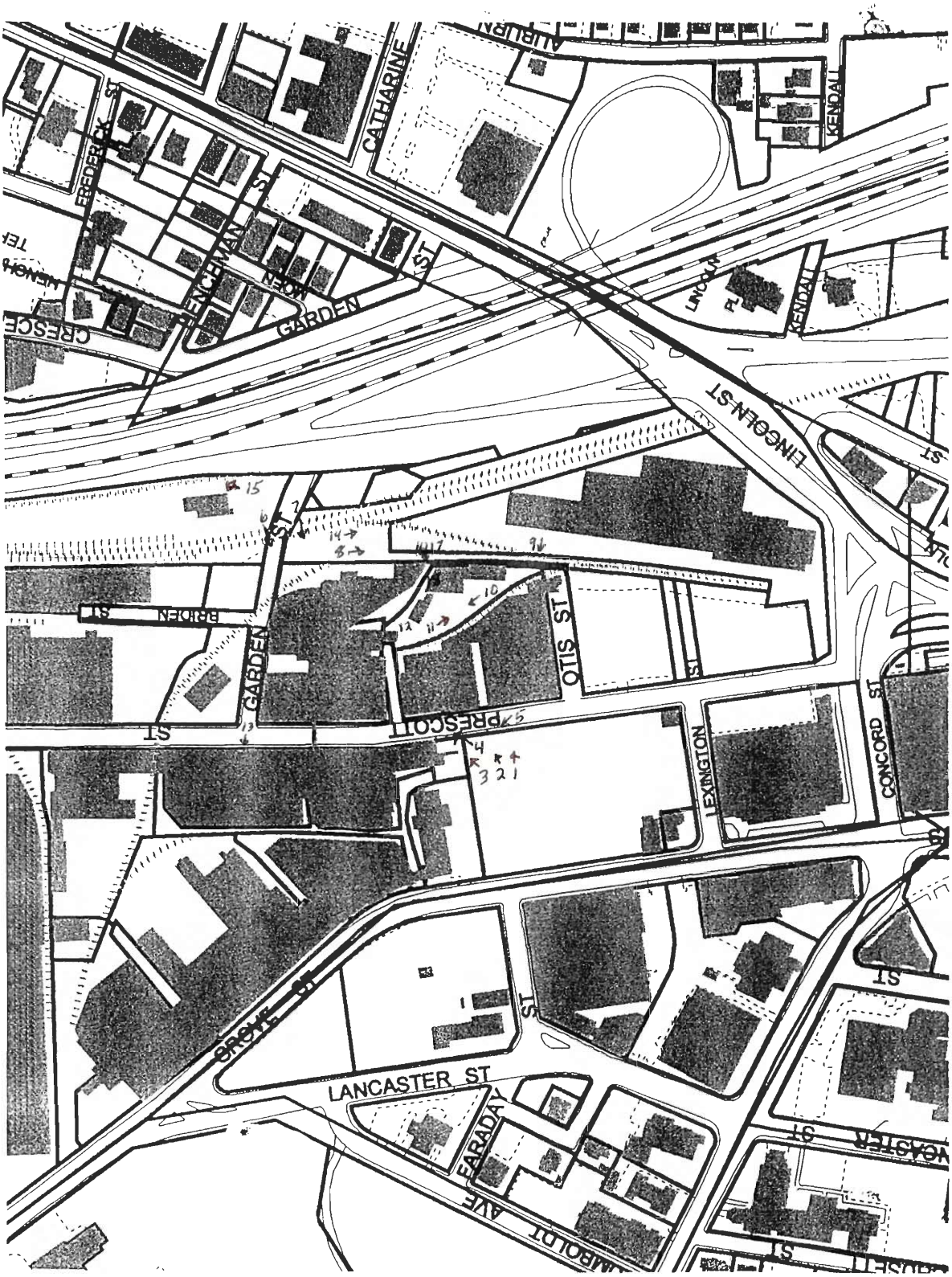
Picture 15 – Interstate 290

Picture 16 – An existing stream of water that daylights between buildings

Picture 17 – A discharge from one of the buildings to the stream

Picture 18 – The stream enters into the ground

In the following map, the number inserted in the map shows where the picture was taken from.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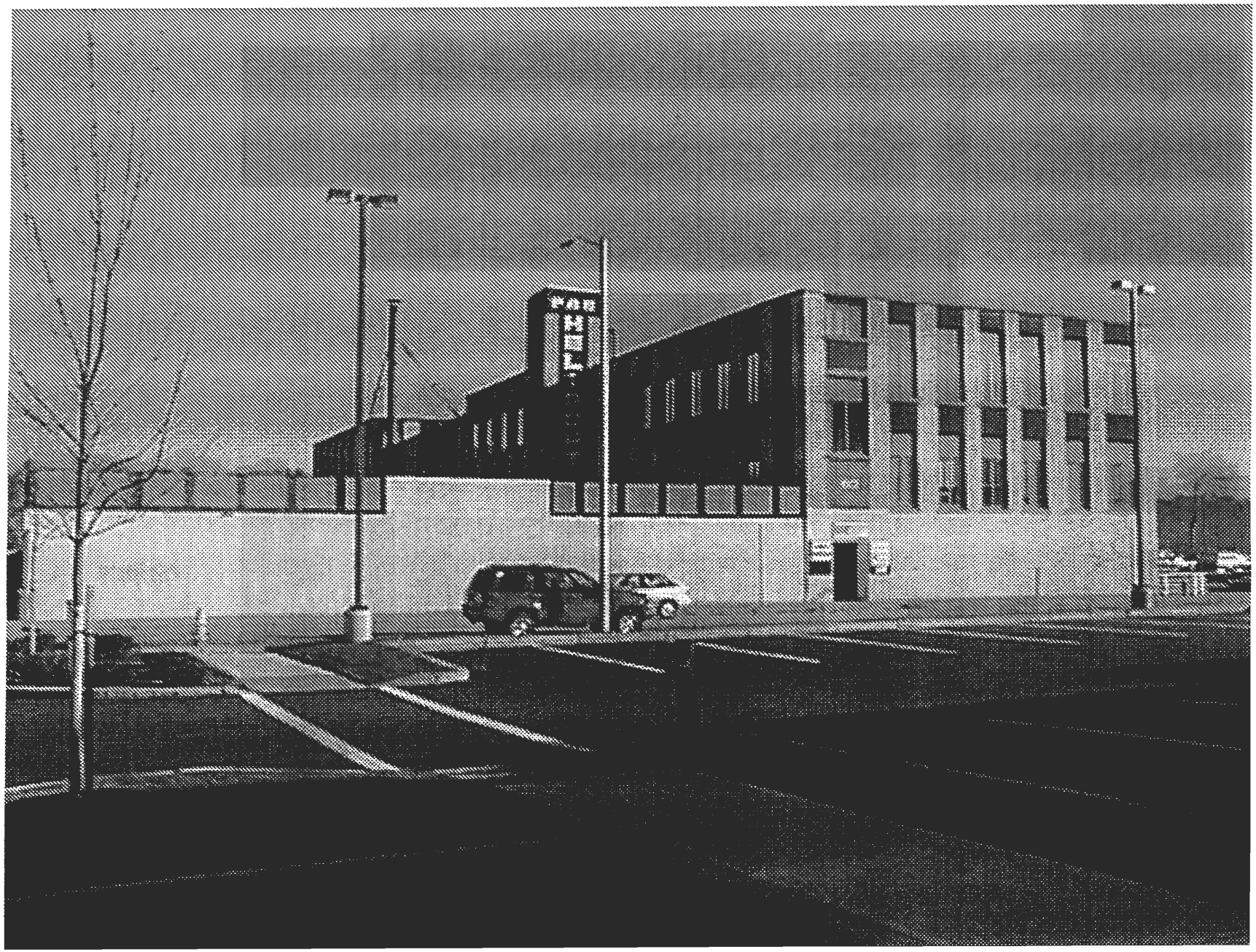
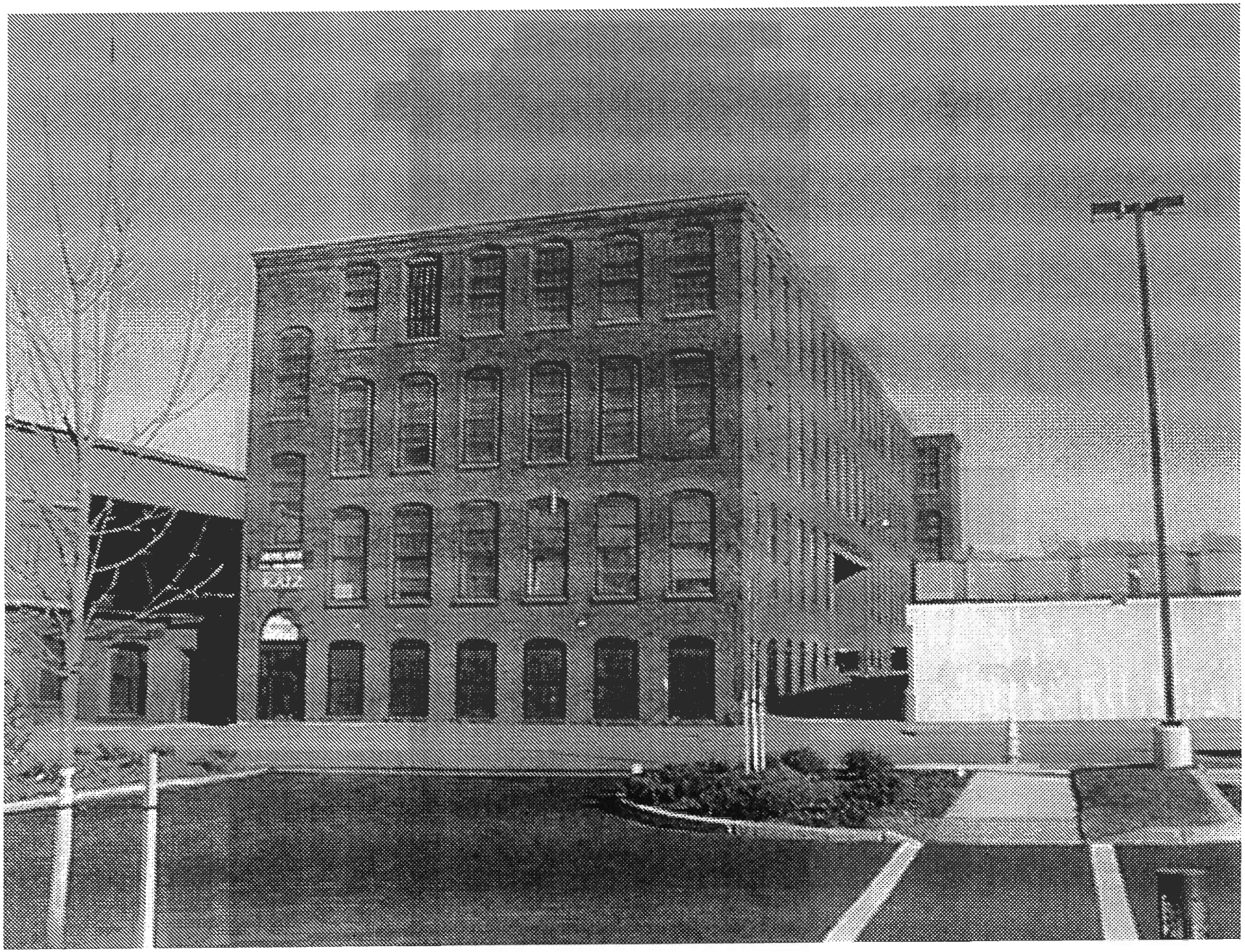
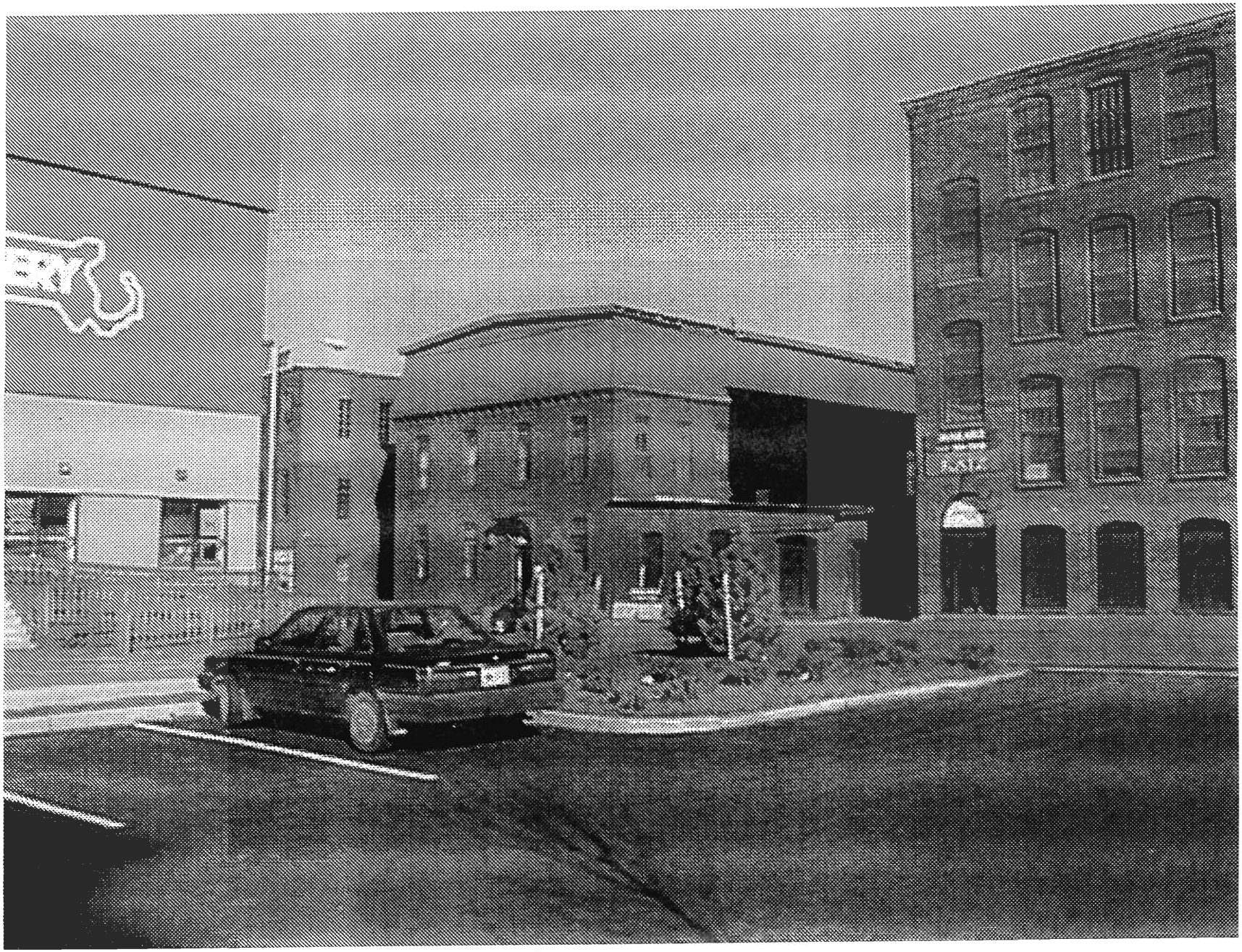
GARDEN ST
OTIS ST
PRESCOTT ST
LEXINGTON
CONCORD ST
LANCASTER ST
FARADAY
BROWN
BRIDGEN ST



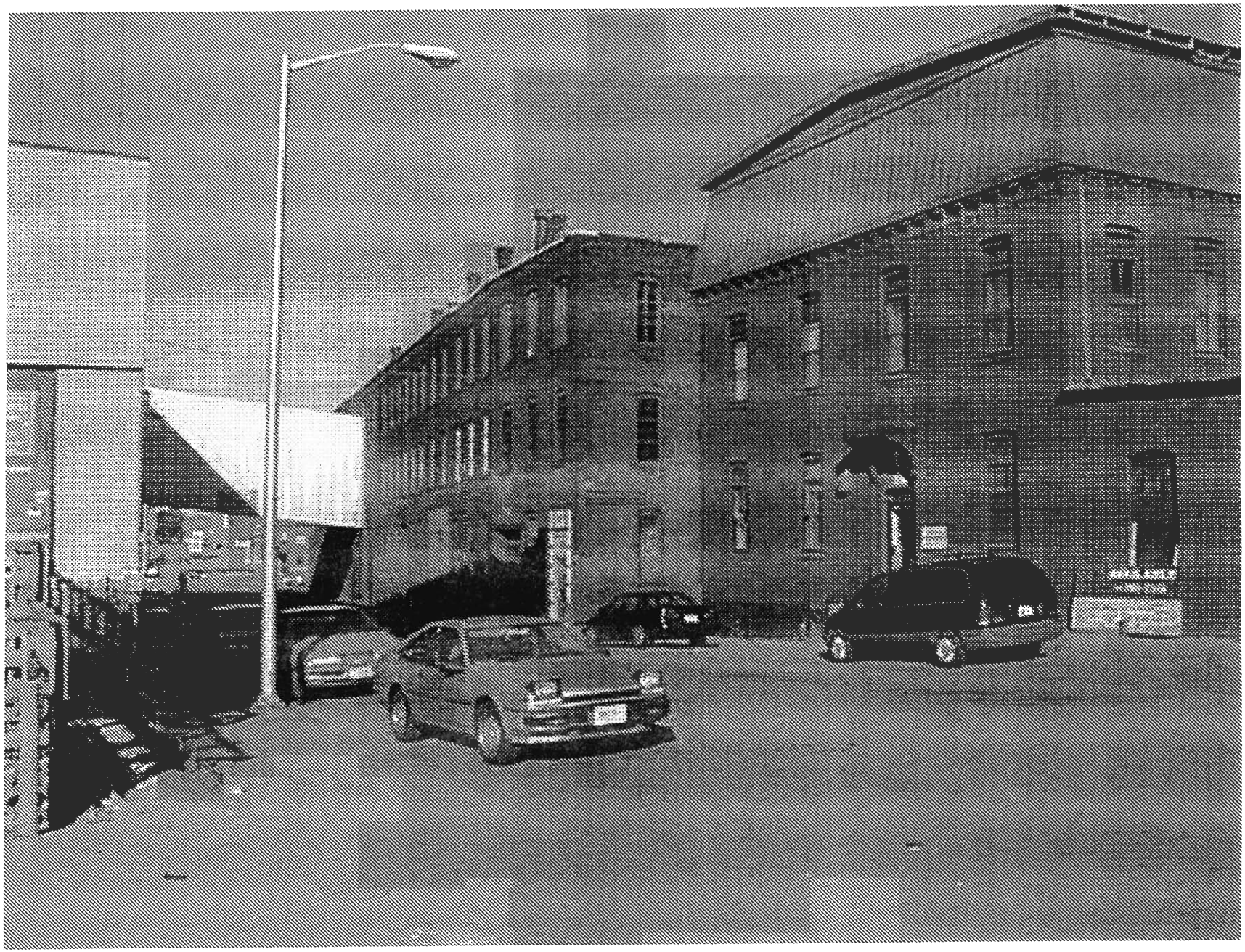
Picture 1 – Furniture warehouse



Picture 2 – Furniture warehouse

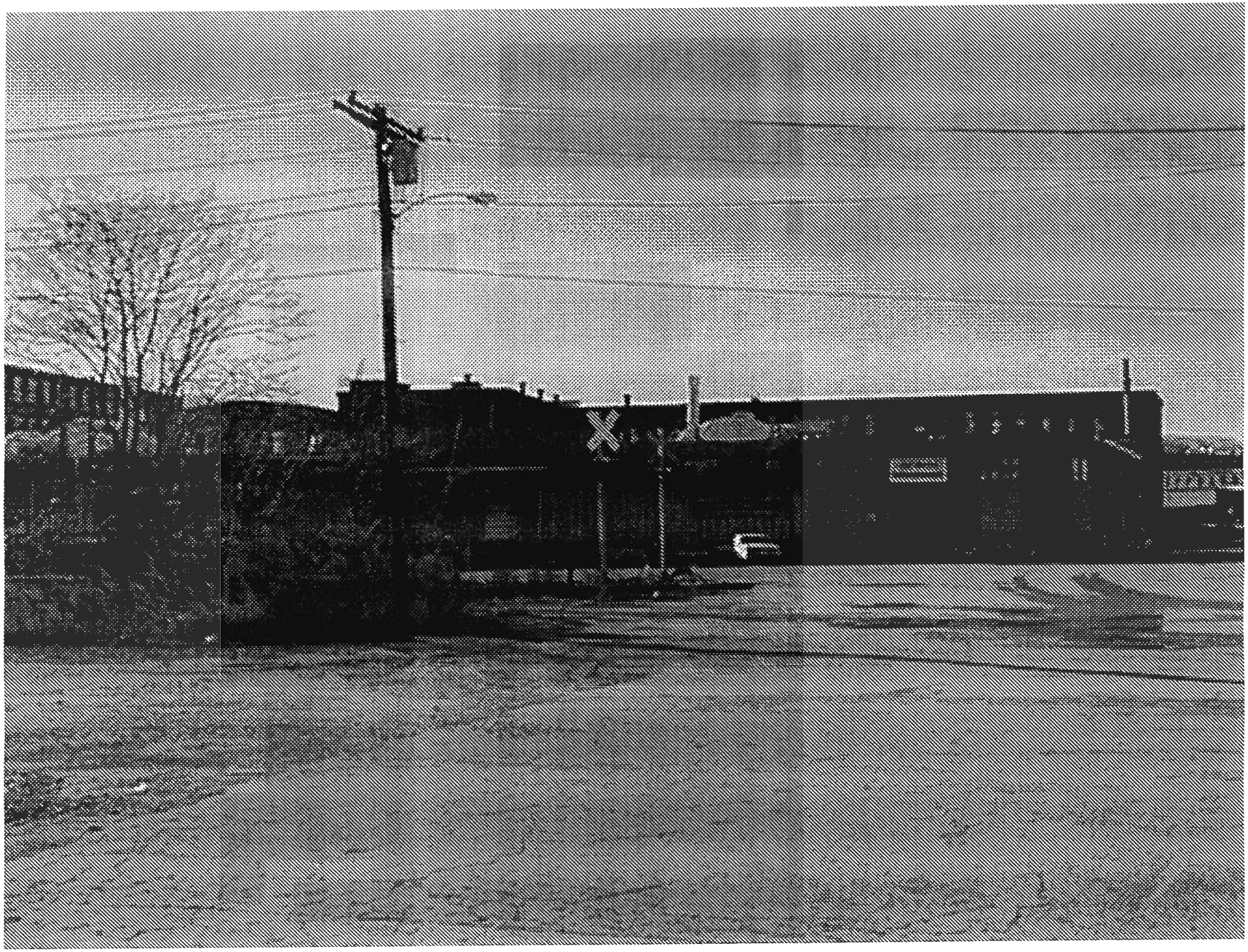


Picture 3 – Storage space

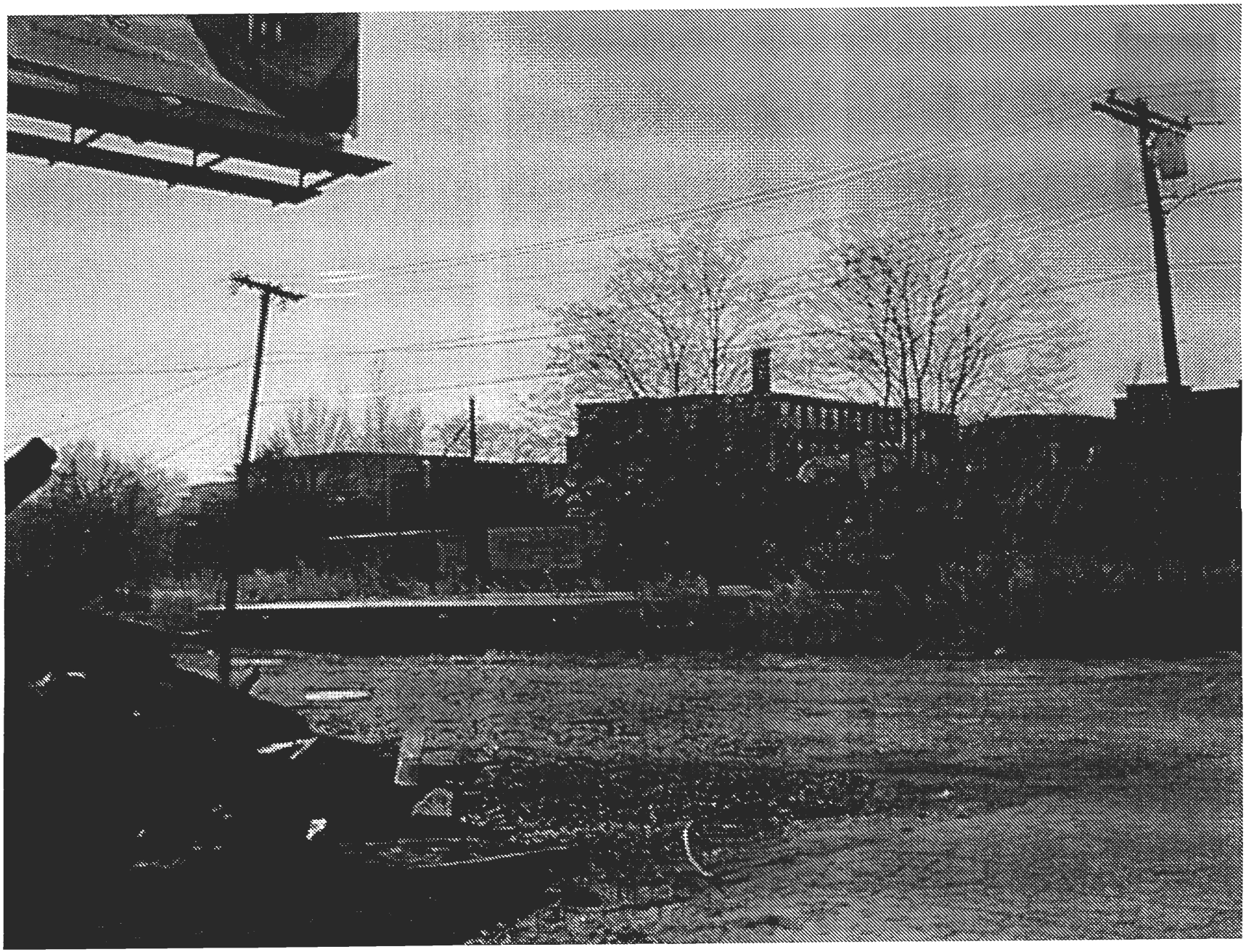


Picture 4 – Old Supply Company

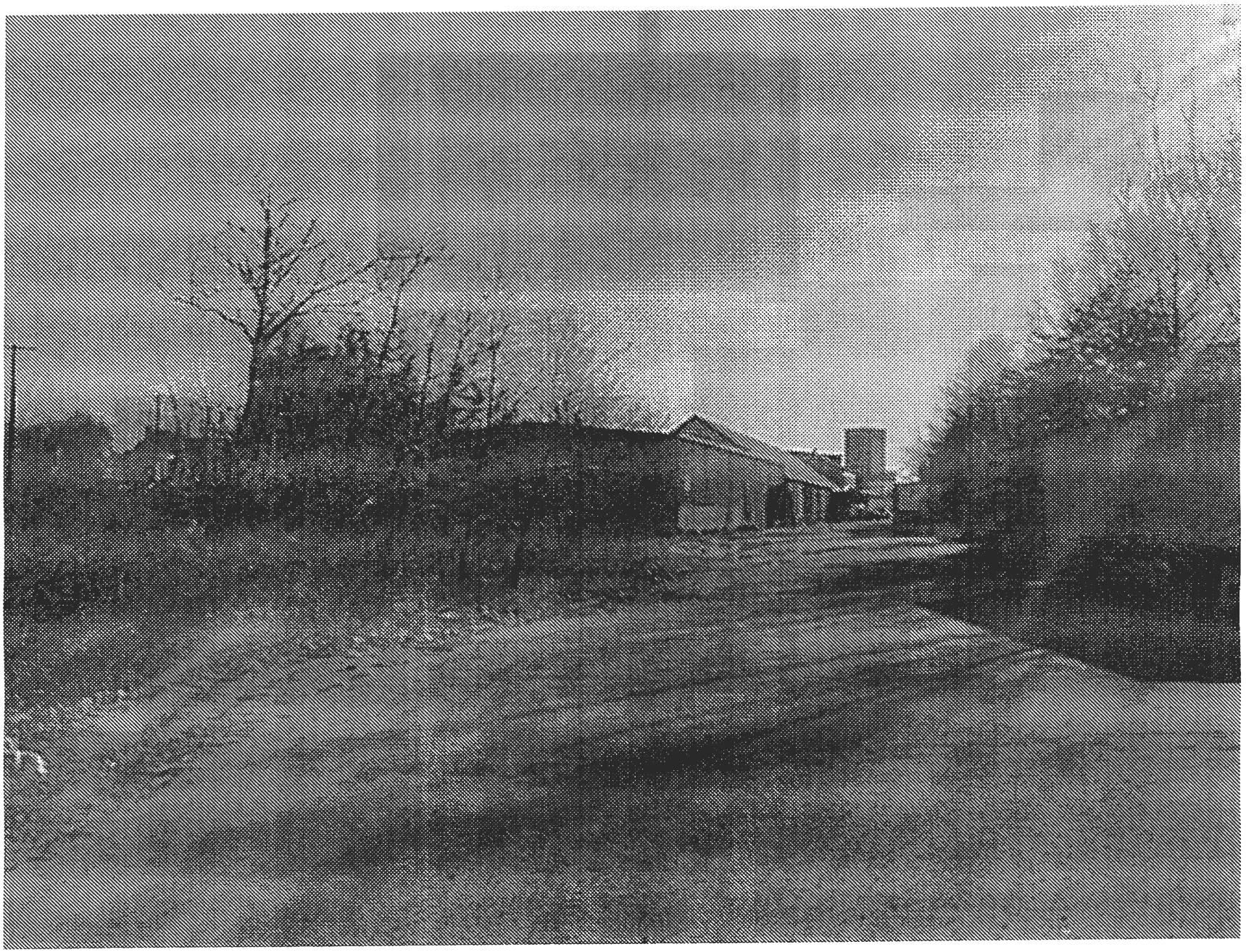
Picture 5 – The Massachusetts Lottery Company



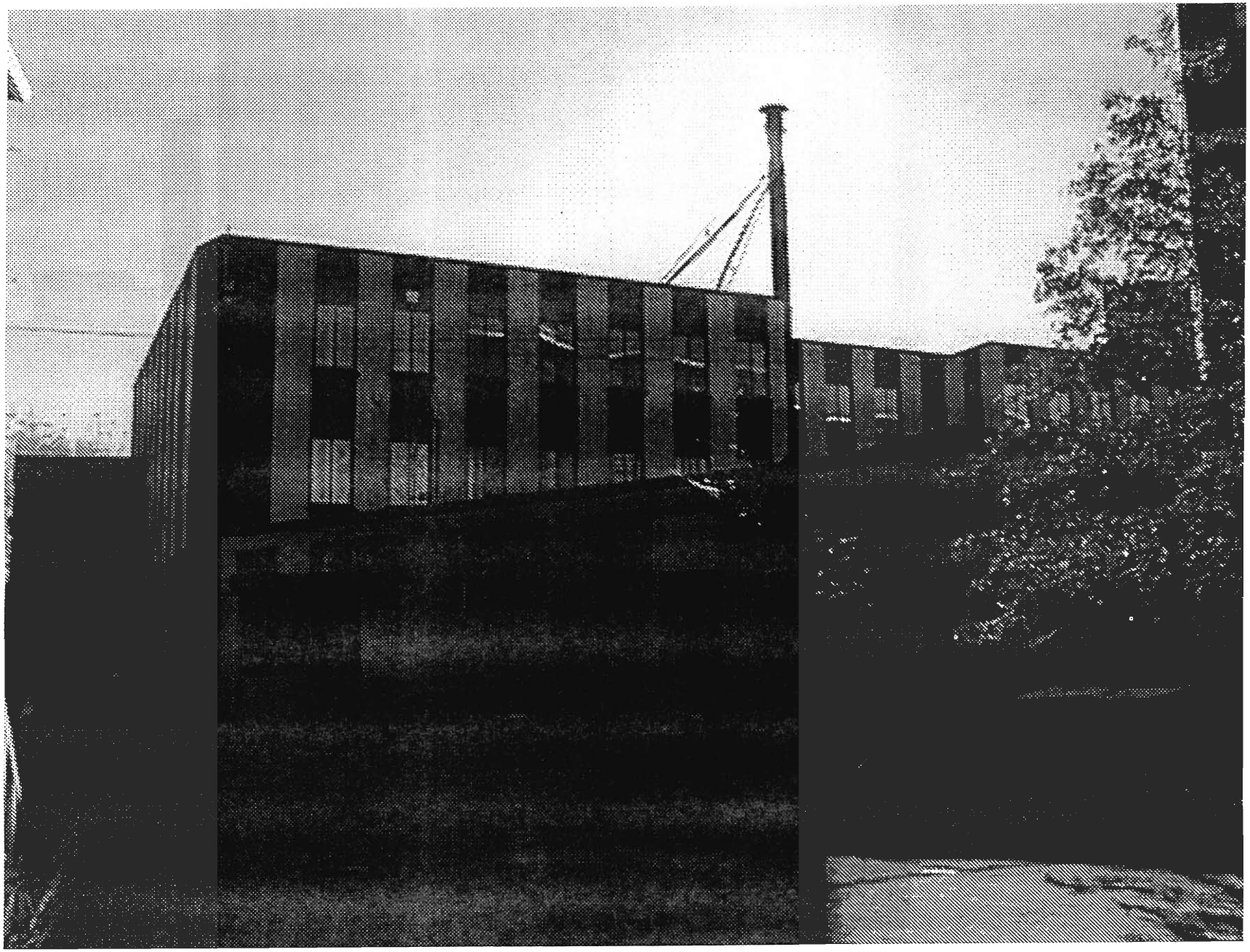
Picture 6 – New England Plating Company



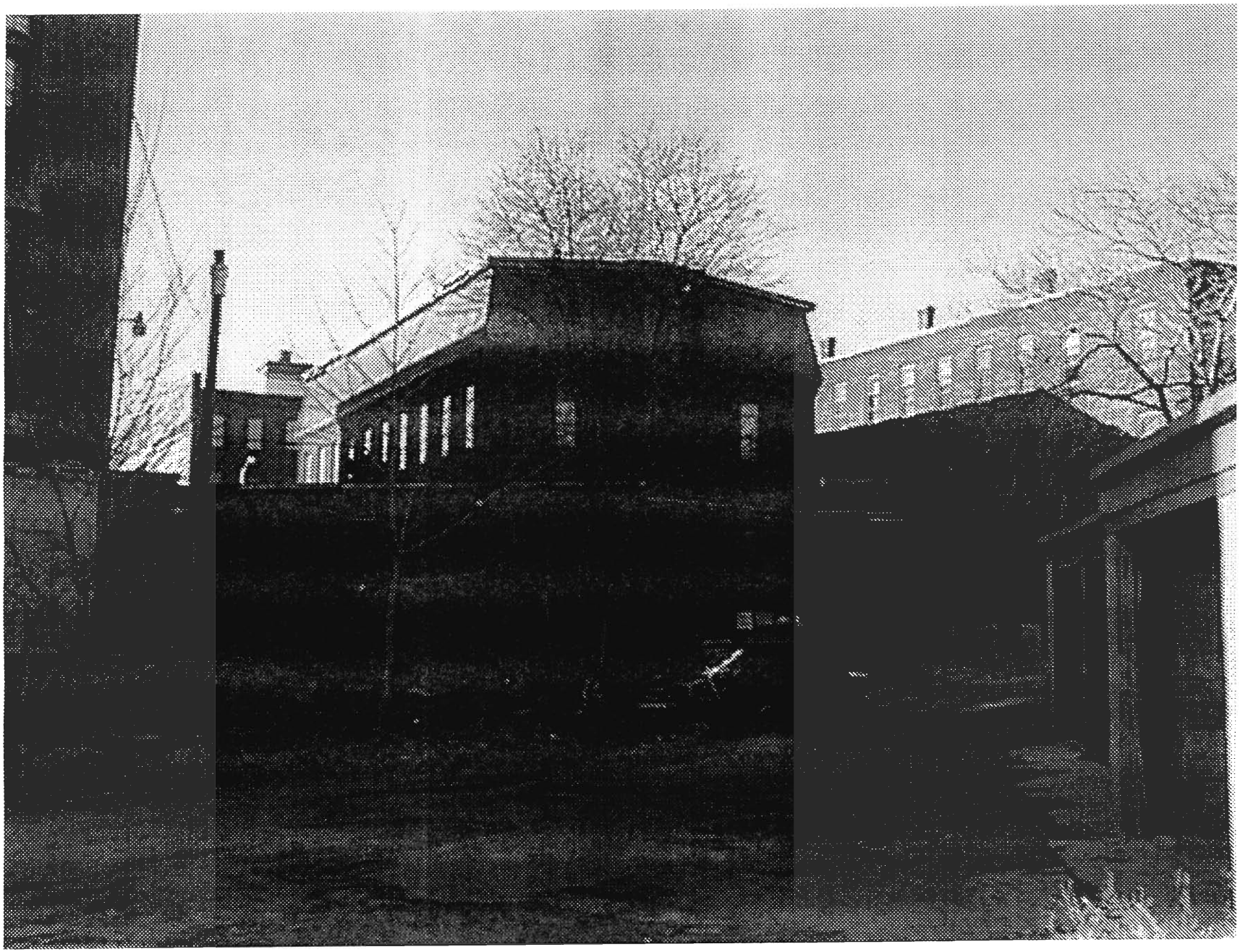
Picture 7 – Behind the 2 furniture warehouses



Picture 8 – Paper World Party Supplies



Picture 9 – Behind first furniture warehouse



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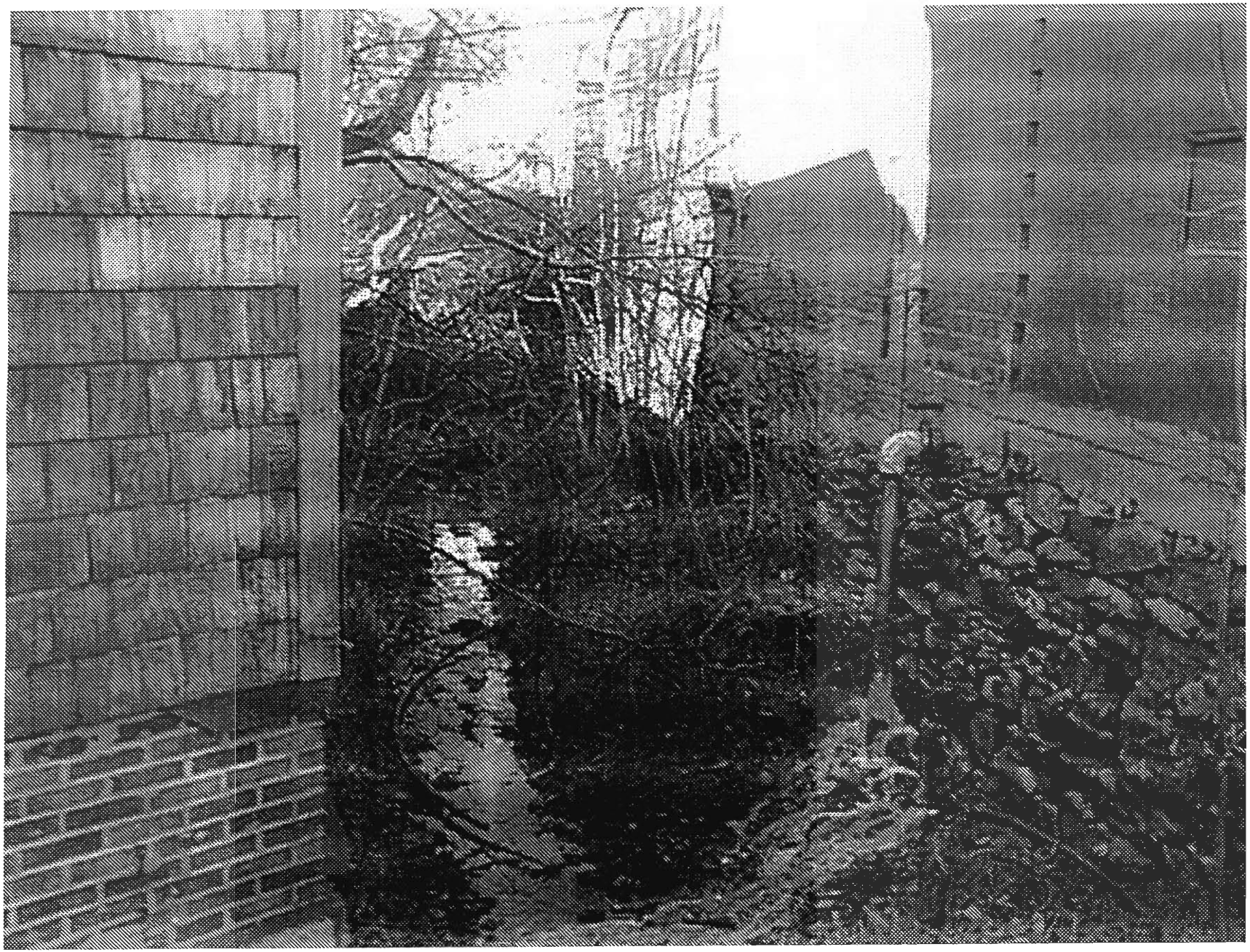
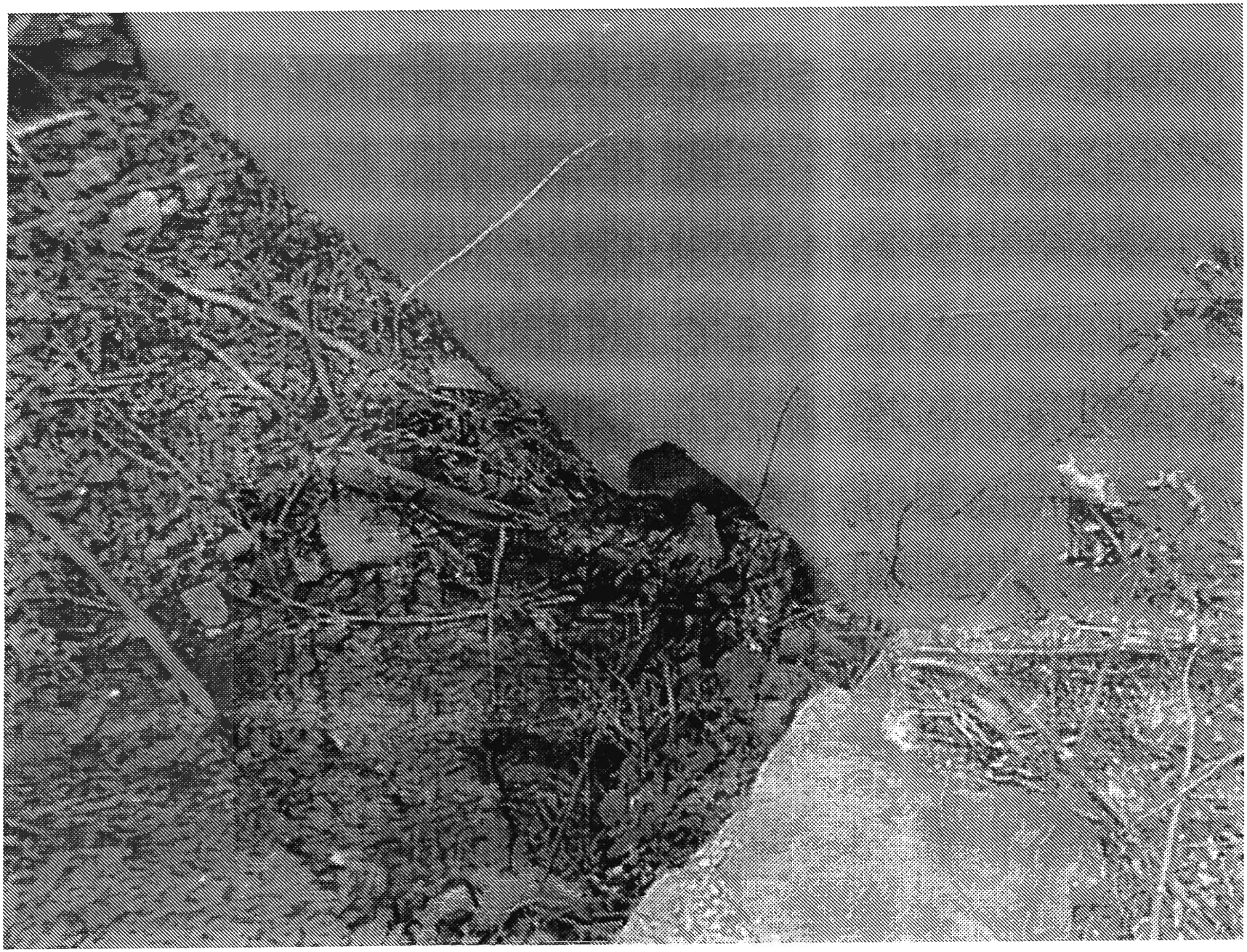


Picture 17 – A discharge from one of the buildings to the stream



Picture 18 – The stream enters into the ground