

6/25/2007



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF ENVIRONMENTAL REMEDIATION  
PRAP/ROD ROUTING SLIP



TO: Sal Ervolina, Assistant Division Director

FROM: The attached is submitted for your approval by:

NAME	INITIAL	DATE
Project Manager: Kevin Sarnowicz	KS	6/25/07
Section Chief/RHWRE: James Quinn	JQ	6/25/7
Bureau Director: P. David Smith	PDS	6/25/7

DATE: 6/25/2007

RE: Site Name 93 Main Street  
City Binghamton

Site Code 704027

County Broome

☐ PRAP

- ☐ Draft PRAP
- ☐ Clean copy of the PRAP
- ☐ Redline/Strikeout version of the PRAP
- ☐ Copies of edits to PRAP (Sal's/Dale's)
- ☐ Site Briefing Report
- ☐ NYSDOH concurrence letter
- ☐ USEPA concurrence letter

PRAP Release Approvals

Ass't Div Director: \_\_\_\_\_  
Sal Ervolina

Division Director: \_\_\_\_\_  
Dale Desnoyers

☒ ROD Amendment

- ☐ Draft ROD
- ☒ Signature-ready copy of the ROD
- ☒ Redline/Strikeout version of the ROD
- ☒ Copies of edits to ROD (Sal's/Dale's)
- ☒ Site Briefing Report
- ☒ NYSDOH concurrence letter
- ☐ USEPA concurrence letter

ROD Signoff

Ass't Div Director: \_\_\_\_\_  
Sal Ervolina 6/27/07

☐ BRIEFING

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Room: \_\_\_\_\_

c: Dale Desnoyers  
Other reviewers who are invited to Briefing



**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**  
**DIVISION OF ENVIRONMENTAL REMEDIATION**  
**Site Briefing Report**



<b>Site Code</b>	704027	<b>Site Name</b>	93 Main Street	
<b>Classification</b>	02	<b>Address</b>	93 Main Street	
<b>Region</b>	7	<b>City</b>	Binghamton	<b>Zip</b> 13905
<b>Latitude</b>	42.10	<b>Town</b>	Binghamton	<b>Project Manager</b> Kevin Sarnowicz
<b>Longitude</b>	-75.92	<b>County</b>	Broome	
<b>Site Type</b>	Structure		<b>Estimated Size</b>	0.8000

### Site Description

The site is located in a commercial part of the City of Binghamton, NY. The property was occupied by a pest exterminator company up until 1980. Analysis of the subsurface soil revealed three areas that were contaminated with pesticides, herbicides, volatiles organic compounds (VOCs) and semi-volatiles on the 89-91 and 93 Main Street properties. The buildings occupying 89-91 and 93 Main were demolished by the City of Binghamton in September 1999. A Remedial Investigation/Feasibility Study (RI/FS) was completed with a Record of Decision (ROD) signed on March 31, 2000. A remedial design work plan has been written and the design is being developed.

<b>Materials Disposed at Site</b>	<b>Quantity Disposed</b>
CHOLRODANE (U036 AND K097)	UNKNOWN
GAMMA BHC / 4,4DDD+2 / 2'DDD / 4,4DDT / 4,4'DDE	UNKNOWN
BETA BHC	UNKNOWN
ALDRIN	UNKNOWN
DIELDRIN (P037)	UNKNOWN
ENDOSULFAN SULFATE	UNKNOWN
HEPTACHLOR (P059 AND K097)	UNKNOWN
ENDRINE	UNKNOWN
ENDRINE KETONE	UNKNOWN

**Analytical Data Available for :** Groundwater, Soil

**Applicable Standards Exceeded for:** Groundwater, Drinking Water

### Assessment of Environmental Problems

Pesticide contamination of soil and groundwater within a principal aquifer has been confirmed at this site. Contaminant levels are several orders of magnitude above the applicable standards. However, the hard till soil that is present approximately 23 feet down seems to be limiting any further downward migration of contaminants.

### Assessment of Health Problems

Pesticide contamination of subsurface soil, some building materials, and groundwater has been documented at this site. The results of the State's soil vapor intrusion investigation indicate that the site's contaminants have not impacted the air quality of neighboring buildings. Former site buildings have been demolished, and the majority of the site is covered with the concrete slab remains of the

former buildings. A storage area on the site, where a small amount of contaminated material from excavation and demolition work is stored, is fenced from potential trespassers. Exposures to contaminants in groundwater are not expected since the area is served by a municipal water supply. The NYSDOH and NYSDEC will evaluate the need to collect additional soil vapor samples in buildings near the site to confirm that actions are not needed to address exposures related to soil vapor intrusion.

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## **Remedy Description and Cost**

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### **Remedy Description for Operable Unit 01**

NYSDEC has selected Hydraulic Containment and Chemical Oxidation as the remedy for this site. This remedy would involve the collection of contaminated groundwater and leachate generated during treatment. An oxidizing agent, such as hydrogen peroxide, would be introduced and allowed to infiltrate through the areas of contamination to break down the compounds of concern in the subsurface soils.

A pilot study was recently performed at the site. Ozone injection was the chemical oxidation technology chosen for the pilot study. The data collected concluded this type of technology will not work to remediate the pesticide contamination at the site.

<b>Total Cost</b>	\$450,903
<b>Capital Cost</b>	\$230,063
<b>OM&amp;M Cost</b>	\$28,600

### **Issues / Recommendations**

Based upon this recent information, the NYSDEC has considered changing the remedy called for by the March 2000 ROD.

Actual costs for excavation and disposal of this waste stream is significantly less than estimated during the feasibility study.

Using the information from the RI/FS and predisign field sampling, a cost estimate for excavation and off-site disposal of the pesticide contamination at 93 Main Street has been developed. Rather than the \$1,849,000 present worth cost estimated in the FS, the present worth cost is now estimated to be approximately \$528,000. This new cost estimate compares more favorably to the ROD-selected remedy of hydraulic Containment w/ Chemical Oxidation, at a present worth of \$451,000.

**From:** Kevin Sarnowicz  
**To:** Paulsen, Lucretia  
**Date:** 7/9/2007 12:13:40 PM  
**Subject:** Fwd: Re: ROD amendment question

Lu,  
This is the information I got about the Declaration Statement for Dale Signiture on ROD amendments.  
Kevin

>>> Larry Alden 7/9/2007 10:14 AM >>>  
Kevin,

If you haven't already gotten your answer (I was in vacation), you do not need a declaration statement.  
Dale signs off on the briefing cover sheet.

Larry

>>> Kevin Sarnowicz 6/29/2007 10:20:35 AM >>>  
Larry,  
Does the final ROD amendment need a declaration statement for Dale to sign and date like a ROD?  
Kevin

BOBC  
LE - Please add a  
cover sheet / Declaration  
Page per our Discussion.  
Twp  
Dale

Declaration Page has been added  
for Dale's signature  
Kevin

# **DECLARATION STATEMENT - RECORD OF DECISION AMENDMENT**

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## **93 Main Street Inactive Hazardous Waste Disposal Site City of Binghamton, Broome County, New York Site No. 7-04-027**

### **Statement of Purpose and Basis**

The Record of Decision (ROD) Amendment presents the selected remedy for the 93 Main Street site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the 93 Main Street inactive hazardous waste disposal site, and the public's input to the Proposed ROD Amendment presented by the NYSDEC.

### **Assessment of the Site**

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD Amendment, presents a current or potential significant threat to public health and/or the environment.

### **Description of Selected Remedy**

Based on the results of the Remedial Investigation, Feasibility Study (RI/FS) and revised cost estimates for the 93 Main Street site and the criteria identified for evaluation of alternatives, the NYSDEC has selected "Excavation and Off-Site Disposal". The components of the remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. Excavation and off-site disposal of approximately 1,059 cubic yards of contaminated soil. Localized groundwater contamination will be treated on-site by a temporary treatment system as part of the dewatering process during soil excavation.

3. Site restoration by bringing in approved backfill free of industrial and/or other contamination, grading to insure proper drainage, placement of additional topsoil as necessary, and seeding.
4. Implementation of a groundwater monitoring program to document the attenuation of residual groundwater contamination.
5. Development of a site management plan to provide the details of the groundwater monitoring plan.
6. Imposition of an institutional control in the form of an environmental easement that will require (a) compliance with the approved site management plan; (b) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; (c) the property owner or person implementing the remedy to complete and submit to the Department a periodic certification of institutional controls; (d) the property owner or persons implementing the remedy to complete, prior to the development of any occupied structures or buildings on the site, an evaluation of the potential for soil vapor intrusion to occur, including a provision for mitigation of any impacts identified; and (e) limit the use of the property to "restricted-residential use" as defined by 6NYCRR Part 375. The property may also be used for commercial or industrial uses if approved by local zoning.
7. The property owner or person implementing the remedy will provide a periodic certification of institutional controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: (a) contain certification that the institutional controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

#### **New York State Department of Health Acceptance**

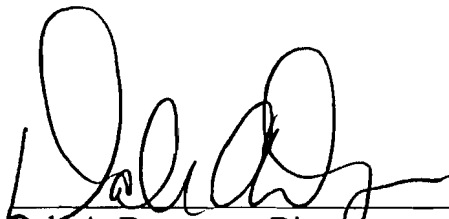
The New York State Department of Health (NYSDOH) concurs that the amended remedy selected for this site is protective of human health.

**Declaration**

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

JUL 17 2007

Date

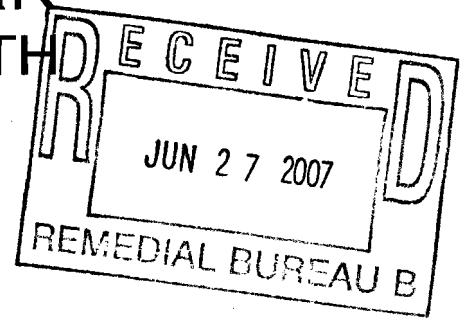
A handwritten signature in black ink, appearing to read 'Dale A. Desnoyers', written over a horizontal line.

Dale A. Desnoyers, Director  
Division of Environmental Remediation



# STATE OF NEW YORK DEPARTMENT OF HEALTH

Flanigan Square, 547 River Street, Troy, New York 12180-2216



June 22, 2007

Mr. Dale Desnoyers, Director  
Division of Environmental Remediation  
NYS Department of Environmental Conservation  
625 Broadway, 12<sup>th</sup> Floor  
Albany, NY 12233-7016

Re: Record of Decision Amendment  
93 Main Street Site  
Site #704027  
Binghamton (C), Broome County

Dear Mr. Desnoyers,

Staff reviewed the June 2007 Record of Decision Amendment for the 93 Main Street Site, located in Binghamton, Broome County. Prior investigations completed at the site have identified soil and groundwater contaminated with volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and pesticides.

A Record of Decision (ROD) was previously signed for this site on March 27, 2000, in which "Alternative 5: Hydraulic Containment and Chemical Oxidation" was the selected site remedy. However, following the completion of a pilot study conducted in 2005, it has been determined that the site remedy will not meet the remedial goals of the ROD. Results of the pilot study indicate that although chemical oxidation will reduce VOC and SVOC contamination at the site, it is not an effective technology to remediate pesticide contamination.

In response to this determination, the site remedy will be changed to "Excavation and Off-Site Disposal." As part of the remedy, approximately 1,059 cubic yards of contaminated soil will be removed from three areas of the site (i.e., areas near a former dry well and two floor drains) using conventional methods and equipment. Excavation operations will require dewatering of the soil, on-site treatment of groundwater by a temporary treatment system, and transportation of contaminated soils off-site to an approved disposal facility, followed by appropriate site restoration (i.e., backfilling, grading, and seeding).

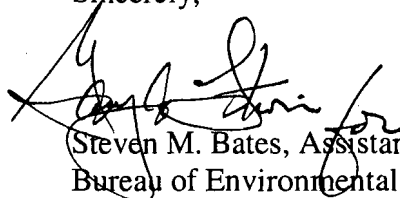
As part of the remedy, a site management plan will be developed that includes the implementation of a post-excavation groundwater monitoring program that will assess the attenuation of residual groundwater contamination. In addition, the remedy will include institutional controls in the form of an environmental easement that will require: (a) compliance



with the approved site management plan; (b) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; (c) the property owner to complete and submit to the state a periodic certification of institutional controls; (d) the property owner to complete, prior to the development of any occupied structures or buildings on the site, an evaluation of the potential for soil vapor intrusion to occur, including a provision for mitigation of any potential impacts identified; and (e) restricting the future use of the property to a use no less restrictive than "restricted-residential use" as defined by 6NYCRR Part 375.

Based on the available information, I believe the amended remedy is protective of public health and concur with it. If you have any questions, please call Mark VanValkenburg at (518) 402-7860.

Sincerely,

A handwritten signature in black ink, appearing to read "Steven M. Bates", is written over a printed name and title.

Steven M. Bates, Assistant Director  
Bureau of Environmental Exposure Investigation

cc: G.A. Carlson, Ph.D. / A. Salame-Alfie, Ph.D.  
G. Litwin / M. VanValkenburg / file  
R. Denz – BCHD  
D. Smith – NYSDEC, Central  
J. Quinn / K. Sarnowicz – NYSDEC, Central  
M.J. Peachey / G. Townsend – NYSDEC, Region 7

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# RECORD OF DECISION AMENDMENT

## 93 MAIN STREET SITE



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Binghamton / Broome County / Registry No. 7-04-027 June 2007

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Prepared by the New York State Department of Environmental Conservation  
Division of Environmental Remediation

### 1.0 INTRODUCTION

On March 27, 2000, the New York State Department of Environmental Conservation (Department) signed a Record of Decision (ROD) which selected a remedy to cleanup the 93 Main Street Site. The ROD signed in March 2000 chose "Hydraulic Containment and Chemical Oxidation" as the remedy for the site based on the evaluating criteria presented in the Remedial Feasibility Study. However, since the remedy selection, a pilot study was implemented at the site to gather data to design the chemical oxidation remedy. The pilot study concluded that even though chemical oxidation may reduce the volatile organic compound (VOC) and semi-volatile organic compound (SVOC) contamination at the site, chemical oxidation could not remediate the pesticide contamination at the site to meet the remedial goals of the ROD.

In response, a revised cost estimate for an alternate remedy, Excavation and Off-site Disposal, was developed. Based on the new and significantly lower cost estimate, the Department has elected to change the remedy for the 93 Main Street site to "Excavation and Off-Site Disposal".

A public comment period was scheduled from April 18, 2007 to May 19, 2007 and a public meeting was held at 7:00 PM on May 2 at the Binghamton State Office Building.

### 2.0 SITE INFORMATION

#### 2.1 Site Description

The 93 Main Street Site consists of four parcels of land, 89-91 and 93 Main Street and 27 and 29 Arthur Street, located in the City of Binghamton, Broome County (Figure 1). An abandoned former apartment building existed on the 93 Main Street parcel and a partially completed motel building existed on the 89-91 Main Street parcels. Both of these deteriorated structures were demolished by the city of Binghamton in September of 1999. The 93 Main Street parcel was at one time home to the McMahon Brothers Pest Control company. The areas of contamination are centered around a dry well located on 89-91 Main Street and two drains on 93 Main Street. Figure 2 shows the properties described above. The surrounding area is a mix of residential and commercial buildings.

#### 2.2 Site History

From the 1950's to the 1980's the McMahon Brothers Pest Control company operated at the 93 Main Street Site. It was reported that the site was used as a pesticide/herbicide storage and handling location for the company. There were also allegations of spills having taken place at the site.

In 1995 Gaynor Associates of Cortland, NY performed a Phase II environmental audit on the 93 Main Street

property for a financial institution. The results of the investigation revealed elevated concentrations of herbicides and pesticides in the subsurface soil, specifically 2,4,5-trichlorophenol at 12,000 parts per million (ppm); 2,4-dichlorophenol at 4,030 ppm; and chlordane at 15,000 ppm.

During the investigation, Gaynor determined that a back area of the building had been used by McMahon for pesticide storage and handling. This area had since been converted to apartments, and the concrete floor covered with tile or carpet. During the Gaynor study, strong pesticide odors were noted in the vacant apartments, which were in serious disrepair.

In 1995 the City, in response to these and other complaints, entered into a Voluntary Cleanup Agreement (VCA) with the NYSDEC in order to perform a limited investigation of the site. This investigation focused on the rear of the 93 Main Street building and consisted of Geoprobe® sampling of the soil and groundwater. The results of this investigation revealed elevated concentrations of pesticides/herbicides such as chlordane, aldrin, dieldrin, and 2,4,5-Trichlorophenol in the Site's groundwater and/or subsurface soil which exceeded applicable standard, criteria, or guidance values (SCGs). The presence of these pesticides indicate a threat to the area's sole source aquifer and was the basis for the Site's class "2" designation on the New York State Registry of Inactive Hazardous Waste Disposal Sites.

In October 1998 NYSDEC initiated a Remedial Investigation/Feasibility Study (RI/FS) at the site to define the nature and extent of the contamination and develop remedial alternatives which would be protective of human health and the environment.

The Record of Decision for the site, calling for Hydraulic Containment and Chemical Oxidation, was issued by the New York State Department of Environmental Conservation in March 2000.

### **2.3 Nature and Extent of Site Contamination**

As described in the original ROD and other documents, many soil, groundwater and sediment samples were collected at the site to characterize the nature and extent of contamination. The primary contaminants of concern include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and pesticides.

The VOC contaminants of concern are xylene, ethylbenzene, chlorobenzene, and 1,2-dichloroethane.

The SVOC contaminants of concern are 1,2,4-trichlorobenzene, naphthalene, 2-methylnaphthalene, 2,4,5-trichlorophenol, 2,4-dichlorophenol, pentachlorophenol, phenol, 2-chlorophenol, 1,4-dichlorobenzene, 2-methylphenol, bis(2-ethylhexyl)phthalate and 4-nitrophenol. Other SVOC contaminants of concern include the carcinogenic polycyclic aromatic hydrocarbons (PAHs), benzo(a)anthracene, benzo(k)anthracene, chrysene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene.

The pesticide contaminants of concern are lindane, aldrin, dieldrin, 4,4'-DDT, 4,4'-DDD, 4,4'-DDE, heptachlor, heptachlor epoxide, 2,4-D, chlordane, 4,4'-DDE, endrin, endosulfan I, endosulfan II, beta-BHC, and delta-BHC. These are all listed hazardous wastes and some, such as DDT and chlordane, have been banned from use as pesticides.

## Soil

Three areas of subsurface soil contamination were identified at the 93 Main Street site. One area, the drywell, is located on the 89-91 Main Street property. The other two areas, the drain and the former garage area, are located on the 93 Main Street property.

An extensive survey of the remainder of the site did not identify any other areas of subsurface contamination. Since the site was either covered by buildings or paved, limited surface soil sampling was conducted, which determined that surface soils were not contaminated. However, the buildings were demolished shortly after the RI/FS was complete. Additional soil and groundwater samples were collected during the design that redefined the limits of contamination. This sampling data gathered during the design was used to determine the area that needs to be remediated. Table 1 contains the contaminants that exceeded SCGs for soil and groundwater and their corresponding guidance values and standards.

The drywell area consists primarily of subsurface pesticide contamination. The contaminated area is approximately a 10 foot by 20 foot area of the ground surface that extends to a depth of approximately 18 feet. This area contains approximately 133 cubic yards of contaminated soil. In this area the predominate contaminant was chlordane which was detected at 149 parts per million (ppm).

In the area of the former drain on the 93 Main Street parcel, subsurface soils are contaminated with pesticides and petroleum products. Contamination extends from a 25 foot by 25 foot area of the ground surface to depth of 20 feet. The total volume of contaminated soil in this area is estimated to be approximately 463 cubic yards. Chlordane was detected in this area at up to 490 ppm and xylene was also detected at 100 ppm. Lindane, aldrin, 4,4-DDD, and 4,4-DDT were also detected at concentrations orders of magnitude higher than their respective SCGs.

Demolition of the 93 Main Street building revealed a floor drain in the slab of the garage floor. Subsurface soil samples taken from this area were found to be contaminated with pesticides and herbicides. The contamination extends from an area 25 feet by 25 feet surrounding the garage drain to a depth of approximately 20 feet. This area contains an estimated 463 cubic yards of contaminated soil. Chlordane was detected at 560 ppm in this area, along with silvex at 2.7 ppm and 4,4-DDT at 28 ppm.

## Groundwater

Of the monitoring wells installed during Phase I of the remedial investigation, MW-1 and MW-6 were the only two which showed groundwater exceeding SCGs for VOCs, SVOCs, and pesticides. MW-6 was located directly in the area of highest contamination, associated with the drain on 93 Main Street, and exhibited levels of xylene, 2,4,5-trichlorophenol and dieldrin many times higher than their respective SCGs. Xylene was detected at 130 parts per billion (ppb) in MW-6 along with 2,4,5-trichlorophenol at 440 ppb and dieldrin at 11 ppb. MW-1 was located down gradient and northeast of MW-6. Only pesticide contamination was detected in MW-1, but at levels significantly lower than those in MW-6, such as dieldrin at 1.5 ppb.

During the Phase II investigation contamination was also detected in two of the four newly installed monitoring wells, MW-8 and MW-10. MW-8 and MW-10 are located down gradient of MW 6. MW-8 and MW-10 were also contaminated with low levels of the same pesticides as found during the Phase I in wells MW-1 and MW-6. Overall pesticide levels in the groundwater decline from MW-6 to MW-10. During the most recent round of groundwater sampling MW-6 exhibited dieldrin contamination of 11 ppb and, down

gradient, MW-10 exhibited dieldrin contamination of 0.27 ppb.

## **2.4 Summary of Human Exposure Pathways**

This section describes the types of potential human exposures that could present added health risks to persons at or around the site. A more detailed discussion of the exposure can be found in Section 6.3 of the RI report, which can be found in the document repositories listed above.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- Dermal contact could exist as a pathway at the site if the surface soil is removed and the contaminated subsurface soil is exposed.
- Ingestion/dermal contact could exist as a pathway at the site if a drinking water well was installed immediately down gradient of the source areas on 93 Main Street.

## **2.5 Summary of Environmental Assessment**

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. During the RI it was determined that a Fish and Wildlife Impact Assessment was not necessary, due to its urban location and lack of any migration pathways to sensitive environmental areas. No pathways for environmental exposure and/or ecological risks have been identified other than a threat to the sole source aquifer.

## **2.6 Original Remedy**

Upon signing the March 2000 ROD, the NYSDEC selected Alternative 5, Hydraulic Containment and Chemical Oxidation, as the remedy for the site. The elements of that remedy were as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance and monitoring of the remedial program. This would have included batch and/or pilot testing of oxidizing agents.
2. The area surrounding the drywell on the 89-91 Main street property would have been excavated to a depth of six feet. Confirmatory samples would have been collected from the walls and floor of the excavation to insure that all contaminated soil above remedial objectives was removed. Contaminated soil would have been treated on-site and/or disposed of off-site as appropriate.
3. Infiltration galleries would have been constructed, in each of the remaining areas of concern, as necessary to facilitate application of the oxidizing agent to the contaminated subsurface soil. It was anticipated that injection wells would have also been necessary to properly distribute the oxidizing agent to the lower portion of the contaminated subsurface soil. The infiltration galleries would have consisted of an excavated area directly above the area of subsurface soil which would have been

filled with gravel, to allow for rapid infiltration of the oxidizing agent. The injection wells would have been constructed with materials amenable to the oxidizing agent to be used and would have been capable of injecting the oxidizer under pressure, if necessary.

4. Groundwater extraction wells would have been constructed in order to create a zone of hydraulic containment large enough to collect any leachate produced during treatment of the contaminated soil, as well as the natural groundwater flow in the areas being treated. The extraction well(s) would have also been connected to a treatment system which would have allowed for the removal of residual contamination by additional oxidation, carbon treatment or a combination of the two. In the event that hydraulic containment could not have been achieved, alternative methods of groundwater control would have been evaluated such as physical containment (i.e., slurry wall, grout curtain, etc.).
5. Since the remedy would have resulted in the on-site treatment of hazardous waste over a period of time, a long-term monitoring program would have been instituted. Impacted monitoring wells would have continued to be monitored, along with the leachate collected by the hydraulic containment system. Groundwater quality outside the treatment areas was expected to attenuate once the source of contamination is treated or controlled. Monitoring of the leachate collected by the hydraulic containment system would have given an indication of the effectiveness of the chemical oxidation and the volume of untreated contaminants remaining. This program would have allowed the effectiveness of the hydraulic containment and chemical oxidation to be monitored and would have been a component of the operation and maintenance for the site.

### **3.0 DESCRIPTION OF PROPOSED CHANGES**

#### **3.1 New Information**

A pilot study was performed in November 2005 as part of the preliminary design activities. The goal of the pilot study was to determine the parameters of implementing chemical oxidation injection as the remedy for the site. The pilot study consisted of injecting ozone into the subsurface soil and collecting the ozone and contamination by using a soil vapor extraction system. The pilot study included two sampling events, one in January 2006 and the other in July 2006. Based on the results of the two sampling events and the total mass remaining in the test area, it appears that chemical oxidation is not an effective technology to remediate the site because it will not sufficiently reduce the pesticide component of the contamination.

#### **3.2 ROD Changes**

The excavation and off-site disposal remedy will address the VOC, SVOC, and pesticide impacted soil. The areas of concern delineated in Figure 3 will be excavated using conventional methods and equipment. The estimated removal volume is 1,059 cubic yards of soil, from the drywell and the two areas surrounding the two drains. Excavation operations will require the dewatering of the soil, requiring groundwater to be treated on-site by a temporary treatment system. Excavated soils will be transported off-site to an approved disposal facility. This differs from the original remedy that would have treated the waste on-site by hydraulic containment and chemical oxidation.

## 4.0 EVALUATION OF ROD CHANGES

### 4.1 Remedial Goals

Goals for the cleanup of the site were established in the original ROD and are not being revised by this ROD Amendment. The goals selected for this site are:

- Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.
- Reduce, control, or eliminate to the extent practicable the contamination present within the soils/waste on site.
- Eliminate the threat to the sole source aquifer by removing or treating the source of contamination and curtailing, to the extent possible, migration of contaminated groundwater off the site.
- Eliminate the potential for direct human or animal contact with the contaminated soils or groundwater at the site.
- Attain groundwater standards to the extent practicable.

### 4.2 Evaluation Criteria

The criteria used to compare the remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste disposal sites in New York State (6 NYCRR Part 375). For each criterion, a brief description is provided.

**The first two evaluation criteria are called threshold criteria and must be satisfied in order for an alternative to be considered for selection.**

**1. Protection of Human Health and the Environment.** This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Excavation and Off-Site Disposal will be protective of human health and the environment since contaminated soil will be removed from the site. However, the pilot test showed that the on-site treatment alternative chosen in the March 2000 Record of Decision, "Hydraulic Containment/Chemical Oxidation", is not feasible because chemical oxidation will not completely destroy the pesticide component of the waste and would not have been protective of human health and the environment.

**2. Compliance with New York State Standards, Criteria, and Guidance (SCGs).** Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The primary SCGs to be attained are soil SCGs based on the Department's Cleanup Objectives (Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels." and 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives).

Excavation and off-site disposal will achieve soil SCGs. However, the pilot test performed at the site shows that hydraulic containment and chemical oxidation would not meet SCGs for the pesticides in soil.

**The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.**

**3. Short-term Effectiveness.** The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated.

Both alternatives would involve some degree of excavation, although the excavation and handling of contaminated media is relatively minor for Hydraulic Containment/Chemical Oxidation. These actions could potentially impact worker health and safety, the environment, and the local community.

The Excavation and Off-site Disposal alternative will involve hauling contaminated materials offsite. This will involve a short-term risk due to possible spilling of contaminated media offsite. This will be mitigated by properly covering contaminated media and by establishing proper emergency spill response measures.

**4. Long-term Effectiveness and Permanence.** This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Excavation and Off-site Disposal will be effective in the long-term since all likely exposure pathways will be eliminated. This will be achieved by removing the contaminated soil.

It has been demonstrated by the pilot test that Hydraulic Containment/Chemical Oxidation would not be effective in the long-term since all likely exposure pathways would not be eliminated.

**5. Reduction of Toxicity, Mobility or Volume.** Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Excavation and Off-site Disposal will reduce the toxicity, mobility and volume of the soil contaminated with pesticides, VOCs and SVOCs by removing it from the site. Hydraulic Containment/Chemical Oxidation may reduce the toxicity, mobility and volume of the VOCs and SVOCs by treating them in place, but as demonstrated by the pilot study, not sufficiently to meet NYS soil cleanup guidance values.

**6. Implementability.** The technical feasibility and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Hydraulic Containment/Chemical Oxidation would be more difficult to implement than Excavation and Off-site Disposal because it is a more complex remedy that involves an injection and treatment system. Furthermore, the pilot test showed that this on-site treatment alternative chosen in the March 2000 Record of Decision, is not feasible because chemical oxidation will not completely destroy the pesticide component of the waste and will not be protective of human health and the environment. Excavation and Off-site



Disposal will be easy to implement using conventional excavation techniques.

**7. Cost-Effectiveness.** Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative, totaled, and then compared on a present worth basis.

The cost of Excavation and Off-site Disposal was the evaluation criterion that originally disqualified this alternative from being selected in the March 2000 ROD. The original present worth cost estimate for Excavation and Off-site Disposal was \$1,849,000, while the estimated present worth to complete Hydraulic Containment/Chemical Oxidation, the remedy selected in the March 2000 ROD, is \$451,000.

However, a recently revised cost estimate for Excavation and Off-site Disposal now estimates the present worth cost for this remedy to be \$528,000. The original cost estimate was based on disposal fees at landfills through out New York State that were permitted to receive this type of hazardous waste. The significant decrease in cost is associated with lower estimated disposal fees considering other disposal options outside of New York State. This new estimate is very close to the original remedy's present worth cost of \$451,000.

Further, Excavation and Off-site Disposal will not leave a source of contamination on-site, which will greatly reduce operation and maintenance (O&M) costs compared to Hydraulic Containment/Chemical Oxidation. O&M for Hydraulic Containment/Chemical Oxidation is estimated for a 5 year period and would cost \$28,600 per year. O&M for Excavation and Off-site Disposal, consisting of groundwater sampling, is also estimated for a 5 year period, but will cost only \$6,500 per year.

With the revised cost estimate, Excavation and Off-Site Disposal appears to be most cost effective alternative of the other alternatives discussed in the March 2000 ROD.

**Record of Decision - March 2000 Cost Estimates**

<b>Remedial Alternative</b>	<b>Capital Cost</b>	<b>Annual OM&amp;M</b>	<b>Total Present Worth</b>
Hydraulic Containment w/ Chemical Oxidation (March 2000 estimate)	\$231,000	\$28,600	\$451,000
Excavation and Off-Site Disposal (March 2000 original estimate)	\$1,829,000	\$4,600	\$1,849,000

**Record of Decision Amendment - August 2006 Cost Estimates**

<b>Remedial Alternative</b>	<b>Capital Cost</b>	<b>Annual OM&amp;M</b>	<b>Total Present Worth</b>
Excavation and Off-Site Disposal (August 2006 revised estimate)	\$500,000	\$6,500	\$528,000

**This final criterion is considered a modifying criterion and is considered after evaluating those above. It is focused upon after public comments on the proposed ROD amendment have been received.**

**8. Community Acceptance.** Concerns of the community regarding the proposed changes were evaluated during the public comment period for this amendment. A responsiveness summary has been prepared that describes public comments received and the manner in which the Department addressed them. The responsiveness summary can be found as Appendix A to this document.

## **5.0 SUMMARY OF ROD CHANGES**

The Department has amended the Record of Decision (ROD) for the 93 Main Street Site.

The elements of the amended remedy are as follow:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. Excavation and off-site disposal of approximately 1059 cubic yards of contaminated soil (Figure 3). Localized groundwater contamination will be treated on-site by a temporary treatment system as part of the dewatering process during soil excavation.
3. Site restoration by bringing in approved backfill free of industrial and/or other contamination, grading to insure proper drainage, placement of additional topsoil as necessary, and seeding.
4. Implementation of a groundwater monitoring program to document the attenuation of residual groundwater contamination.
5. Development of a site management plan to provide the details of the groundwater monitoring plan.
6. Imposition of an institutional control in the form of an environmental easement that will require (a) compliance with the approved site management plan; (b) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; (c) the property owner or person implementing the remedy to complete and submit to the Department a periodic certification of institutional controls; (d) the property owner or persons implementing the remedy to complete, prior to the development of any occupied structures or buildings on the site, an evaluation of the potential for soil vapor intrusion to occur, including a provision for mitigation of any impacts identified; and (e) limit the use of the property to "restricted-residential use" as defined by 6NYCRR Part 375. The property may also be used for commercial or industrial uses if approved by local zoning.
7. The property owner or person implementing the remedy will provide a periodic certification of institutional controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: (a) contain certification that the institutional controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

## **6.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION**

As part of the 93 Main Street Site environmental restoration process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

1. A repository for documents pertaining to the site was established.
2. A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
3. A factsheet was mailed to the nearby property owners announcing the availability of the proposed ROD amendment and the public meeting.
4. A public meeting was held on May 2, 2007 at the Binghamton State Office Building.
5. A public comment period for the proposed ROD amendment was established, beginning on April 18, 2007 and ending on May 19, 2007.
6. A Responsiveness Summary (Appendix A) was prepared and included as part of this document, to address the comments received during the public comment period for the proposed ROD amendment.

**Table 1**  
**Nature and Extent of Contamination**

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	Benzene	ND to 72	3 of 24	1
		Tetrachloroethene	ND to 34	3 of 24	5
		Chlorobenzene	ND to 120	3 of 24	5
		Ethylbenzene	ND to 120	3 of 24	5
		1,2-Dichloroethane	ND to 83	4 of 24	0.6
		Toluene	ND to 89	3 of 24	5
		Xylene	ND to 650	3 of 24	5
Groundwater	Semivolatile Organic Compounds (SVOCs)	2,4-Dichlorophenol	ND to 1,400	4 of 24	5
		Naphthalene	ND to 140	2 of 24	10
		2,4,5-Trichlorophenol	ND to 1,500	4 of 24	1
		Pentachlorophenol	ND to 25	2 of 24	1
		Phenol	ND to 2	1 of 24	1
		2-Chlorophenol	ND to 5	1 of 24	1
		1,4-Dichlorobenzene	ND to 4	1 of 24	3
		2-Methylphenol	ND to 2	1 of 24	1
		4 - Methylphenol	ND to 4	1 of 24	1
		benzo(a)anthracene	ND to 1	1 of 24	0.002
		Chrysene	ND to 1	1 of 24	0.002
		Bis(2-Ethylhexyl)-phthalate	ND to 7	1 of 24	5
		Benzo(b)fluoranthene	ND to 2	1 of 24	0.002
		Benzo(a)pyrene	ND to 1	1 of 24	ND
Groundwater	Pesticides	Endrin	ND to 0.15	2 of 24	ND
		Beta-BHC	ND to 0.89	5 of 24	0.04
		Lindane	ND to 91	3 of 24	0.05
		Alpha-BHC	ND to 1.5	1 of 24	0.01

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Pesticides	Delta-BHC	ND to 1.2	4 of 24	0.04
		Heptachlor Epoxide	ND to 0.11	3 of 24	0.03
		Dieldrin	ND to 13	7 of 24	0.004
		Chlordane	ND to 1	3 of 24	0.05
Groundwater	Herbicides	Dicamba	ND to 3	3 of 24	0.44
Groundwater	Metals	Sodium	ND to 60,200	4 of 24	20,000

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCG (ppm)
Soil	Volatile Organic Compounds (VOCs)	Chlorobenzene	ND to 3.2	1 of 16	1.7
		Ethylbenzene	ND to 17	1 of 16	5.5
		Xylene	ND to 100	2 of 16	1.2
Soil	Semivolatile Organic Compounds (SVOCs)	1,2,4-Trichlorobenzene	ND to 24	2 of 16	3.4
		Naphthalene	ND to 30	2 of 16	13
		2-Methylnaphthalene	ND to 190	1 of 16	36
		2,4,5-Trichlorophenol	ND to 7	1 of 16	0.1
		4-Nitrophenol	ND to 2.6	1 of 16	0.1
		Benzo(a)anthracene	ND to 0.7	2 of 16	0.224
		Chrysene	ND to 0.57	3 of 16	0.4
		Benzo(b)fluoranthene	ND to 0.88	5 of 16	0.224
		Benzo(k)fluoranthene	ND to 0.45	3 of 16	0.224
		Benzo(a)pyrene	ND to 0.54	6 of 16	0.061
		Dibenz(a,h)anthracene	ND to 0.28	3 of 16	0.014

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCG (ppm)
Soil	Pesticides	Heptachlor	ND to 22	5 of 16	0.1
		Heptachlor Epoxide	ND to 8.3	5 of 16	0.02
		Dieldrin	ND to 97	4 of 16	0.044
		4,4'-DDE	ND to 24	6 of 16	2.1
		Endrin	ND to 37	5 of 16	0.1
		Endosulfan II	ND to 1	1 of 16	0.90
		Endosulfan I	ND to 8.2	1 of 16	0.90
		Alpha-BHC	ND to 5.6	5 of 16	0.11
		Beta-BHC	ND to 5.6	3 of 16	0.2
		Delta-BHC	ND to 12	6 of 16	0.3
		Lindane	ND to 44	8 of 16	0.06
		Aldrin	ND to 46	6 of 16	0.041
		4,4'-DDT	ND to 150	9 of 16	2.1
		Chlordane	ND to 560	8 of 16	0.54
Soil	Metals	Arsenic	ND to 39	4 of 16	7.5
		Beryllium	ND to 0.5	7 of 16	0.16
		Copper	ND to 81	5 of 16	25
		Iron	ND to 34,200	7 of 16	2,000
		Mercury	ND to 1.1	4 of 16	0.1
		Zinc	ND to 416	7 of 16	20
		Nickel	ND to 20	3 of 16	13

# **APPENDIX A**

## **Responsiveness Summary**

# **RESPONSIVENESS SUMMARY**

**93 Main Street  
Proposed Record of Decision Amendment  
City of Binghamton, Broome County  
Site No. 7-04-027**

The Proposed Record of Decision Amendment for the 93 Main Street site was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on April 10, 2007. This Proposed Record of Decision Amendment outlined the preferred remedial measure proposed for the remediation of the contaminated soil at the 93 Main Street site. The preferred remedy is excavation of the pesticide contaminated soils and institutional controls.

The release of the Proposed Record of Decision Amendment was announced via a notice to the mailing list, informing the public of the document's availability.

A public meeting was held on May 2, 2007 which included a presentation of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site.

The public comment period for the Proposed Record of Decision Amendment ended on May 19, 2007.

This Responsiveness Summary responds to all questions and comments raised at the May 2, 2007 public meeting. There were no written comments received.

The following are the comments received at the public meeting, with the NYSDEC's and NYSDOH's responses:

**COMMENT 1:** How does this site compare to the Endicott site?

**RESPONSE 1:** The 93 Main Street site is significantly less complicated than "the Endicott site." The Endicott site project is studying the effects of a groundwater plume of chlorinated volatile organic compounds covering approximately 500 acres. The 93 Main Street site involves primarily pesticide contamination in the soil, which is relatively non-mobile in the soil vapor phase. Investigation of soil vapor in the area for chlorinated volatile organic compounds was performed as a precautionary measure in response to the low levels of these compounds found on site.

**COMMENT 2:** Could the contamination at the site get worse and is it leaving the site?

**RESPONSE 2:** No, the contamination will not increase. The highest levels of the contamination are in the soil on site. A groundwater plume has migrated off site according to groundwater samples collected during the 1998 and 1999 sampling events. However, the Pre-Design groundwater samples collected during 2005 show that the contaminants in the groundwater are naturally attenuating and the concentrations of the contamination have decreased to levels below New York State Groundwater Standards at the edge



of the plume. The groundwater contamination at this time is localized to the site.

**COMMENT 3:** What can be built on the property with a “restricted-residential use” easement?

**RESPONSE 3:** "Restricted-residential use" prohibits single family housing and any vegetable gardens, although community vegetable gardens may be considered with Department approval. Any other construction and re-use is permitted, including active recreational uses, which are public uses with a reasonable potential for soil contact.

**COMMENT 4:** If the City of Binghamton takes title to the land would it have to pay for the remedial work performed under the Superfund Program?

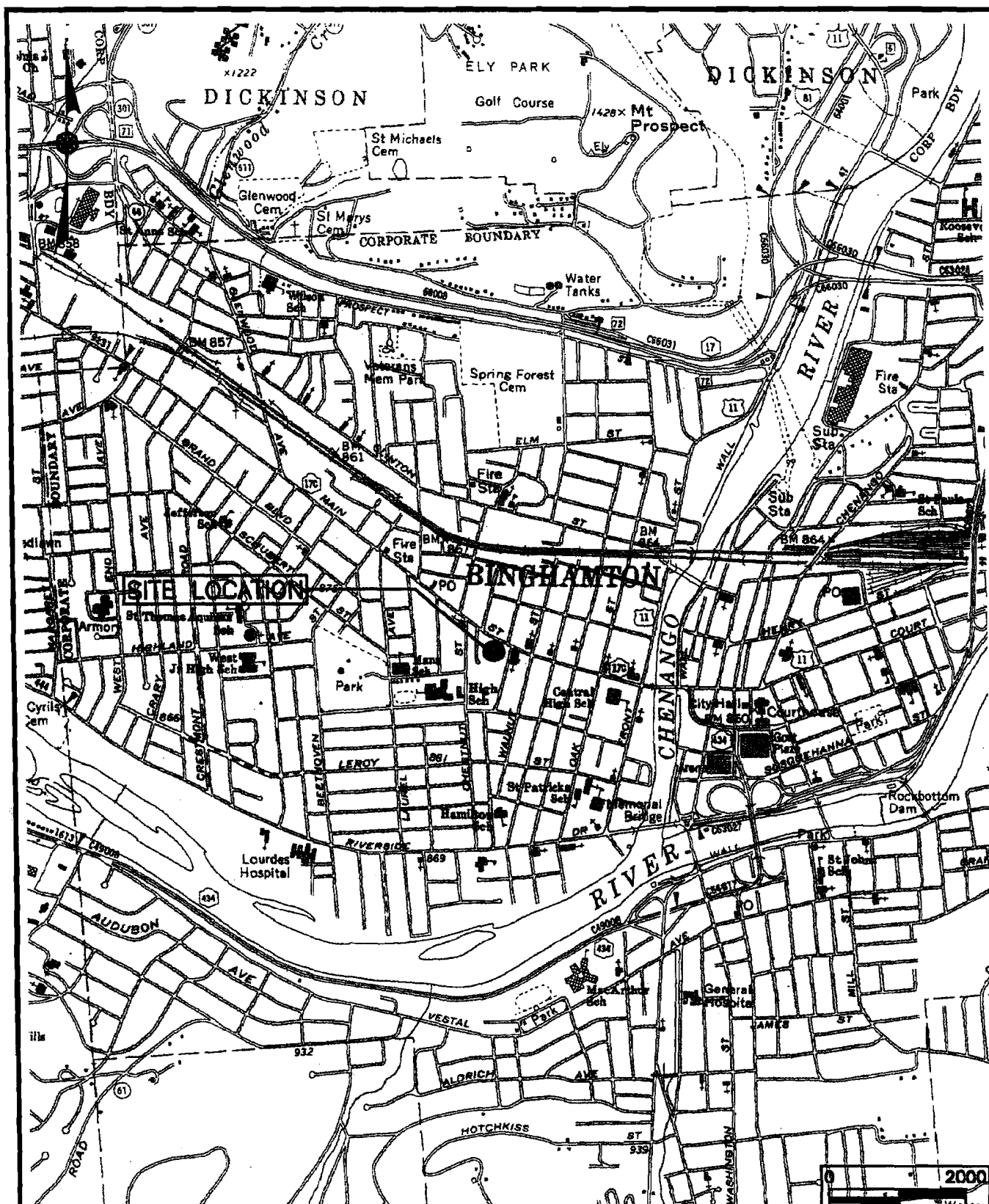
**RESPONSE 4:** At this time the City of Binghamton is not the title holder or a potential responsible party (PRP) under the law and therefore, not required to pay for past costs. Eventually if no PRP pays for past costs associated with the site, a lien will most likely be placed on the real property. With regard to Institutional Controls, should the city take title to the property it will be subject to any environmental easements.

**COMMENT 5:** What can the members of the City of Binghamton Council do to help the project along?

**RESPONSE 5:** Actively participating, like you are doing here tonight, will help the project.

**COMMENT 6:** What will happen next? When will the remedy be implemented?

**RESPONSE 6:** After the Amended Record of Decision is finalized, the project can proceed through remedial design, and a construction contract can be developed, put out for bid, and awarded. At this time, it is anticipated that the bid will be awarded and the remedy will be implemented in the Spring of 2008.



SOURCE: UNITED STATES GEOLOGICAL SURVEY BINGHAMTON WEST QUADRANGLE

93 MAIN STREET SITE REMEDIAL DESIGN  
BINGHAMTON, NEW YORK

SITE LOCATION MAP

**db** Dvirka  
and  
Bartilucci  
CONSULTING ENGINEERS  
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

FIGURE 1

C:\2217\93 main sep rd base.dwg  
OCT 31, 2005 SEP

20' 0' 20'  
SCALE: 1" = 40'

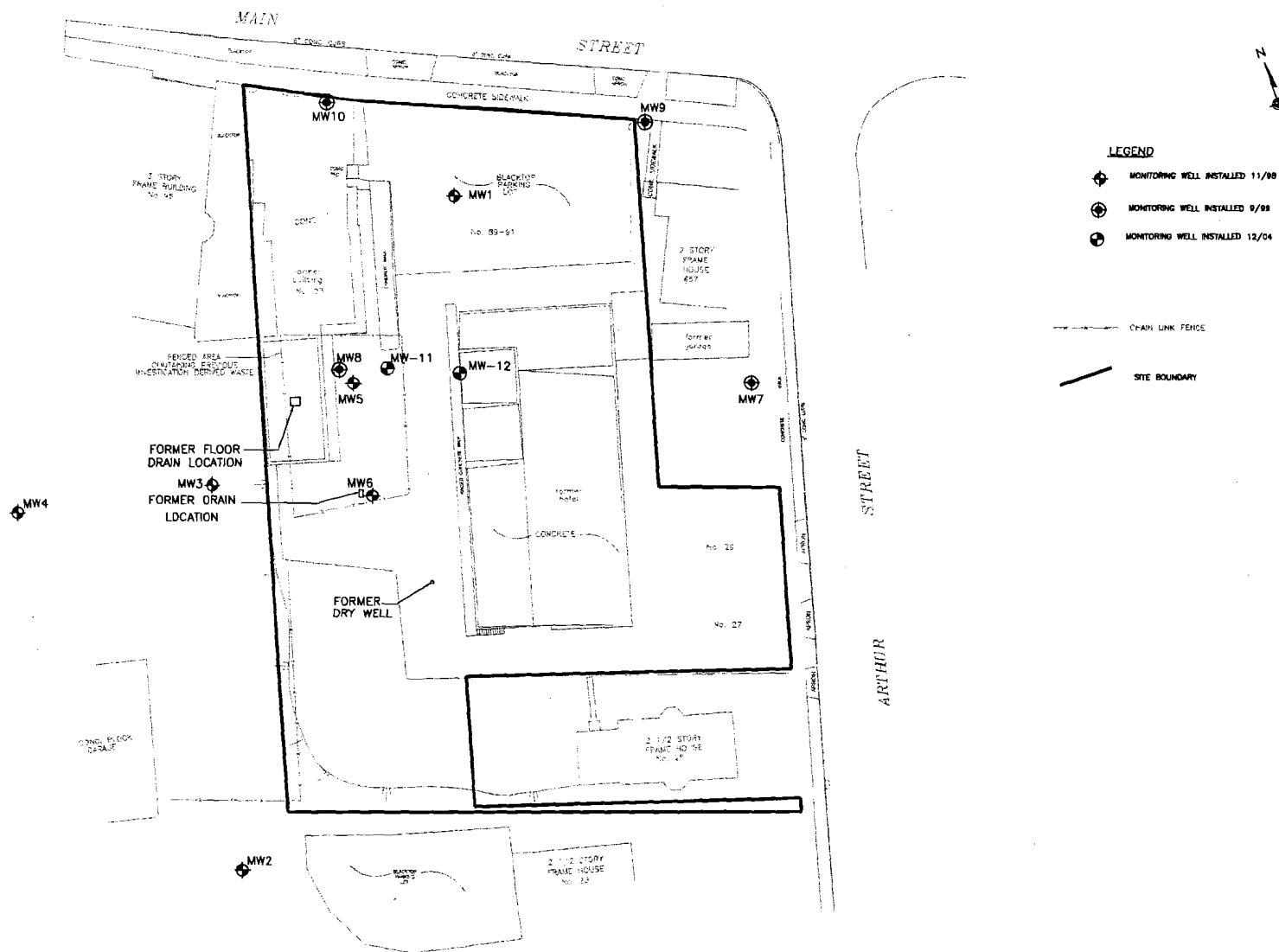


FIGURE 2

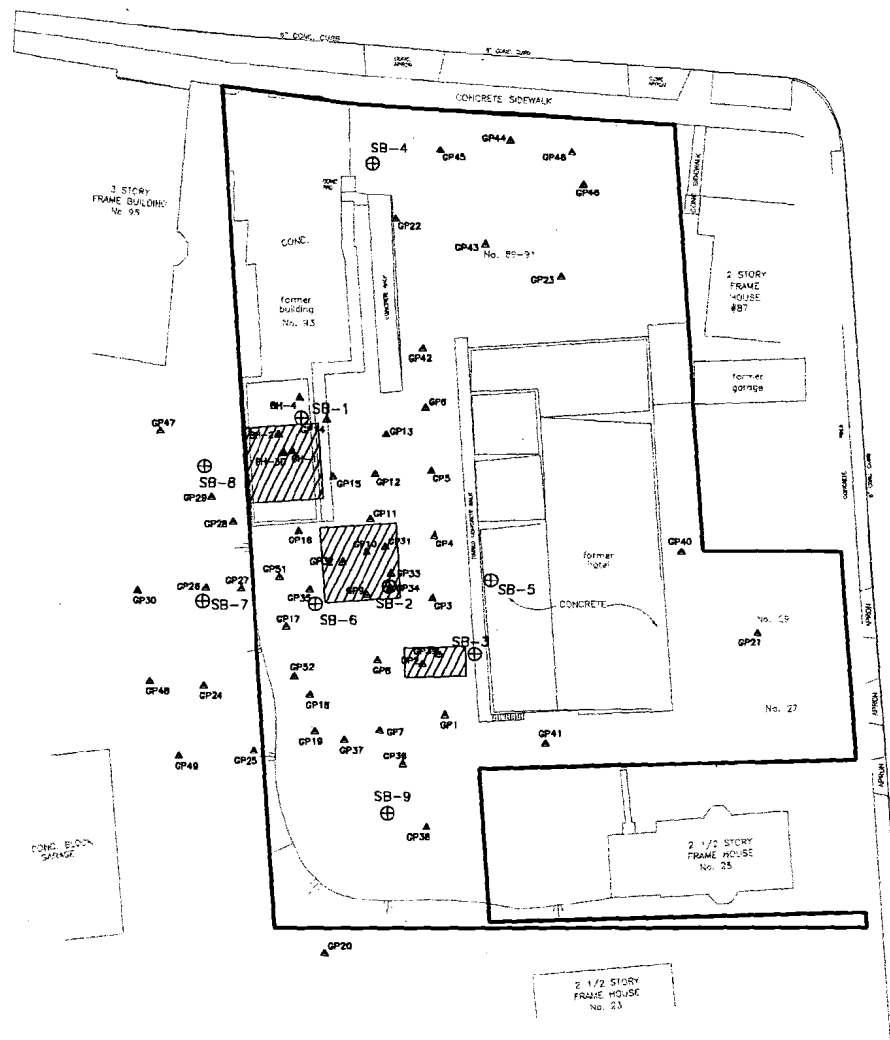
JAN 31, 2005 SEP C:\2217\93 main sep RD base.dwg

20' 0' 20'  
SCALE: 1" = 40'



Dvirko and Bartilucci  
Consulting Engineers  
A Division of William F. Cosulich Associates, P.C.

93 MAIN STREET SITE  
BINGHAMTON, NEW YORK  
SOIL EXCAVATION AREAS



- LEGEND**
- ⊕ SOIL BORING LOCATION 12/05
  - ▲ GEOPROBE / SOIL BORING INSTALLED 11/98
  - ▲ BOREHOLE INSTALLED THROUGH CONCRETE 9/23/99
  - ▨ AREA TO BE REMEDIATED
  - SITE BOUNDARY

FIGURE 3

6/14/2007



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF ENVIRONMENTAL REMEDIATION  
PRAP/ROD ROUTING SLIP



TO: Sal Ervolina, Assistant Division Director

FROM: The attached is submitted for your approval by:

NAME	INITIAL	DATE
Project Manager: Kevin Sarnowicz	KS	6/14/07
Section Chief/RHWRE: James Quinn	JQ	6/14/7
Bureau Director: P. David Smith		

DATE: 6/14/2007

RE: Site Name 93 Main Street  
City Binghamton

Site Code 704027  
County Broome

☐ PRAP

- ☐ Draft PRAP
- ☐ Clean copy of the PRAP
- ☐ Redline/Strikeout version of the PRAP
- ☐ Copies of edits to PRAP (Sal's/Dale's)
- ☐ Site Briefing Report
- ☐ NYSDOH concurrence letter
- ☐ USEPA concurrence letter

PRAP Release Approvals

Ass't Div Director: \_\_\_\_\_

Sal Ervolina

Division Director: \_\_\_\_\_

Dale Desnoyers

☐ ROD

- ☐ Draft ROD
- ☐ Signature-ready copy of the ROD
- ☐ Redline/Strikeout version of the ROD
- ☐ Copies of edits to ROD (Sal's/Dale's)
- ☐ Site Briefing Report
- ☐ NYSDOH concurrence letter
- ☐ USEPA concurrence letter

ROD Signoff

Ass't Div Director: \_\_\_\_\_

Sal Ervolina

☐ BRIEFING

Date: 6/19/07 Time: 2:30 Room: 1219

c: Dale Desnoyers  
Other reviewers who are invited to Briefing



**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**  
**DIVISION OF ENVIRONMENTAL REMEDIATION**  
**Site Briefing Report**



<b>Site Code</b>	704027	<b>Site Name</b>	93 Main Street		
<b>Classification</b>	02	<b>Address</b>	93 Main Street		
<b>Region</b>	7	<b>City</b>	Binghamton	<b>Zip</b>	13905
<b>Latitude</b>	42.10	<b>Town</b>	Binghamton	<b>Project Manager</b>	Kevin Sarnowicz
<b>Longitude</b>	-75.92	<b>County</b>	Broome		
<b>Site Type</b>	Structure			<b>Estimated Size</b>	0.8000

### Site Description

The site is located in a commercial part of the City of Binghamton, NY. The property was occupied by a pest exterminator company up until 1980. Analysis of the subsurface soil revealed three areas that were contaminated with pesticides, herbicides, volatiles organic compounds (VOCs) and semi-volatiles on the 89-91 and 93 Main Street properties. The buildings occupying 89-91 and 93 Main were demolished by the City of Binghamton in September 1999. A Remedial Investigation/Feasibility Study (RI/FS) was completed with a Record of Decision (ROD) signed on March 31, 2000. A remedial design work plan has been written and the design is being developed.

<b>Materials Disposed at Site</b>	<b>Quantity Disposed</b>
CHLORODANE (U036 AND K097)	UNKNOWN
GAMMA BHC / 4,4DDD+2 / 2'DDD / 4,4DDT / 4,4'DDE	UNKNOWN
BETA BHC	UNKNOWN
ALDRIN	UNKNOWN
DIELDRIN (P037)	UNKNOWN
ENDOSULFAN SULFATE	UNKNOWN
HEPTACHLOR (P059 AND K097)	UNKNOWN
ENDRINE	UNKNOWN
ENDRINE KETONE	UNKNOWN

**Analytical Data Available for :** Groundwater, Soil

**Applicable Standards Exceeded for:** Groundwater, Drinking Water

### Assessment of Environmental Problems

Pesticide contamination of soil and groundwater within a principal aquifer has been confirmed at this site. Contaminant levels are several orders of magnitude above the applicable standards. However, the hard till soil that is present approximately 23 feet down seems to be limiting any further downward migration of contaminants.

### Assessment of Health Problems

Pesticide contamination of subsurface soil, limited building materials, and groundwater has been documented at this site. The buildings have been demolished and the majority of the site is covered with the concrete slab remains of the former buildings. A storage area on the site, where a small amount of contaminated material from excavation and demolition work is stored, is fenced. The area

is served by a municipal water supply. Remedial activities planned for this site include excavation and treatment and/or disposal of accessible contaminated subsurface soils. Remaining contaminated soils will be treated by in-situ chemical oxidation. Groundwater will be monitored to ensure attenuation and success of treatment. Soil vapor samples are being collected as part of remedial design activities to evaluate the potential for soil vapor intrusion in neighboring buildings.

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## **Remedy Description and Cost**

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### **Remedy Description for Operable Unit 01**

NYSDEC has selected Hydraulic Containment and Chemical Oxidation as the remedy for this site. This remedy would involve the collection of contaminated groundwater and leachate generated during treatment. An oxidizing agent, such as hydrogen peroxide, would be introduced and allowed to infiltrate through the areas of contamination to break down the compounds of concern in the subsurface soils.

A pilot study was recently performed at the site. Ozone injection was the chemical oxidation technology chosen for the pilot study. The data collected concluded this type of technology will not work to remediate the pesticide contamination at the site.

<b>Total Cost</b>	\$450,903
<b>Capital Cost</b>	\$230,063
<b>OM&amp;M Cost</b>	\$28,600

### **Issues / Recommendations**

Based upon this recent information, the NYSDEC has considered changing the remedy called for by the March 2000 ROD.

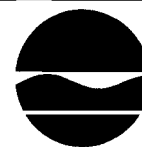
Actual costs for excavation and disposal of this waste stream is significantly less than estimated during the feasibility study.

Using the information from the RI/FS and predisign field sampling, a cost estimate for excavation and off-site disposal of the pesticide contamination at 93 Main Street has been developed. Rather than the \$1,849,000 present worth cost estimated in the FS, the present worth cost is now estimated to be approximately \$528,000. This new cost estimate compares more favorably to the ROD-selected remedy of hydraulic Containment w/ Chemical Oxidation, at a present worth of \$451,000.

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# RECORD OF DECISION AMENDMENT

## 93 MAIN STREET SITE



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Binghamton / Broome County / Registry No. 7-04-027 June 2007

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Prepared by the New York State Department of Environmental Conservation  
Division of Environmental Remediation

### 1.0 INTRODUCTION

On March 27, 2000, the New York State Department of Environmental Conservation (Department) signed a Record of Decision (ROD) which selected a remedy to cleanup the 93 Main Street Site. The ROD signed in March 2000 chose "Hydraulic Containment and Chemical Oxidation" as the remedy for the site based on the evaluating criteria presented in the Remedial Feasibility Study. However, since the remedy selection, a pilot study was implemented at the site to gather data to design the chemical oxidation remedy. The pilot study concluded that even though chemical oxidation may reduce the volatile organic compound (VOC) and semi-volatile organic compound (SVOC) contamination at the site, chemical oxidation could not remediate the pesticide contamination at the site to meet the remedial goals of the ROD.

In response, a revised cost estimate for an alternate remedy, Excavation and Off-site Disposal, was developed. Based on the new and significantly lower cost estimate, the Department has elected to change the remedy for the 93 Main Street site to "Excavation and Off-Site Disposal".

A public comment period was scheduled from April 18, 2007 to May 19, 2007 and a public meeting was held at 7:00 PM on May 2 at the Binghamton State Office Building.

### 2.0 SITE INFORMATION

#### 2.1 Site Description

The 93 Main Street Site consists of four parcels of land, 89-91 and 93 Main Street and 27 and 29 Arthur Street, located in the City of Binghamton, Broome County (Figure 1). An abandoned former apartment building existed on the 93 Main Street parcel and a partially completed motel building existed on the 89-91 Main Street parcels. Both of these deteriorated structures were demolished by the city of Binghamton in September of 1999. The 93 Main Street parcel was at one time home to the McMahon Brothers Pest Control company. The areas of contamination are centered around a dry well located on 89-91 Main Street and two drains on 93 Main Street. Figure 2 shows the properties described above. The surrounding area is a mix of residential and commercial buildings.

#### 2.2 Site History

From the 1950's to the 1980's the McMahon Brothers Pest Control company operated at the 93 Main Street Site. It was reported that the site was used as a pesticide/herbicide storage and handling location for the company. There were also allegations of spills having taken place at the site.

In 1995 Gaynor Associates of Cortland, NY performed a Phase II environmental audit on the 93 Main Street



property for a financial institution. The results of the investigation revealed elevated concentrations of herbicides and pesticides in the subsurface soil, specifically 2,4,5-trichlorophenol at 12,000 parts per million (ppm); 2,4-dichlorophenol at 4,030 ppm; and chlordane at 15,000 ppm.

During the investigation, Gaynor determined that a back area of the building had been used by McMahon for pesticide storage and handling. This area had since been converted to apartments, and the concrete floor covered with tile or carpet. During the Gaynor study, strong pesticide odors were noted in the vacant apartments, which were in serious disrepair.

In 1995 the City, in response to these and other complaints, entered into a Voluntary Cleanup Agreement (VCA) with the NYSDEC in order to perform a limited investigation of the site. This investigation focused on the rear of the 93 Main Street building and consisted of Geoprobe® sampling of the soil and groundwater. The results of this investigation revealed elevated concentrations of pesticides/herbicides such as chlordane, aldrin, dieldrin, and 2,4,5-trichlorophenol in the Site's groundwater and/or subsurface soil which exceeded applicable standard, criteria, or guidance values (SCGs). The presence of these pesticides indicate a threat to the area's sole source aquifer and was the basis for the Site's class "2" designation on the New York State Registry of Inactive Hazardous Waste Disposal Sites.

In October 1998 NYSDEC initiated a Remedial Investigation/Feasibility Study (RI/FS) at the site to define the nature and extent of the contamination and develop remedial alternatives which would be protective of human health and the environment.

The Record of Decision for the site, calling for Hydraulic Containment and Chemical Oxidation, was issued by the New York State Department of Environmental Conservation in March 2000.

### **2.3 Nature and Extent of Site Contamination**

As described in the original ROD and other documents, many soil, groundwater and sediment samples were collected at the site to characterize the nature and extent of contamination. The primary contaminants of concern include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and pesticides.

The VOC contaminants of concern are xylene, ethylbenzene, chlorobenzene, and 1,2-dichloroethane.

The SVOC contaminants of concern are 1,2,4-trichlorobenzene, naphthalene, 2-methylnaphthalene, 2,4,5-trichlorophenol, 2,4-dichlorophenol, pentachlorophenol, phenol, 2-chlorophenol, 1,4-dichlorobenzene, 2-methylphenol, bis(2-ethylhexyl)phthalate and 4-nitrophenol. Other SVOC contaminants of concern include the carcinogenic polycyclic aromatic hydrocarbons (PAHs), benzo(a)anthracene, benzo(k)anthracene, chrysene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene.

The pesticide contaminants of concern are lindane, aldrin, dieldrin, 4,4'-DDT, 4,4'-DDD, 4,4'-DDE, heptachlor, heptachlor epoxide, 2,4-D, chlordane, 4,4'-DDE, endrin, endosulfan I, endosulfan II, beta-BHC, and delta-BHC. These are all listed hazardous wastes and some, such as DDT and chlordane, have been banned from use as pesticides.

## **Soil**

Three areas of subsurface soil contamination were identified at the 93 Main Street site. One area, the drywell, is located on the 89-91 Main Street property. The other two areas, the drain and the former garage area, are located on the 93 Main Street property.

An extensive survey of the remainder of the site did not identify any other areas of subsurface contamination. Since the site was either covered by buildings or paved, limited surface soil sampling was conducted, which determined that surface soils were not contaminated. However, the buildings were demolished shortly after the RI/FS was complete. Additional soil and groundwater samples were collected during the design that redefined the limits of contamination. This sampling data gathered during the design was used to determine the area that needs to be remediated. Table 1 contains the contaminants that exceeded SCGs for soil and groundwater and their corresponding guidance values and standards.

The drywell area consists primarily of subsurface pesticide contamination. The contaminated area is approximately a 10 foot by 20 foot area of the ground surface that extends to a depth of approximately 18 feet. This area contains approximately 133 cubic yards of contaminated soil. In this area the predominate contaminant was chlordane which was detected at 149 parts per million (ppm).

In the area of the former drain on the 93 Main Street parcel, subsurface soils are contaminated with pesticides and petroleum products. Contamination extends from a 25 foot by 25 foot area of the ground surface to depth of 20 feet. The total volume of contaminated soil in this area is estimated to be approximately 463 cubic yards. Chlordane was detected in this area at up to 490 ppm and xylene was also detected at 100 ppm. Lindane, aldrin, 4,4-DDD, and 4,4-DDT were also detected at concentrations orders of magnitude higher than their respective SCGs.

Demolition of the 93 Main Street building revealed a floor drain in the slab of the garage floor. Subsurface soil samples taken from this area were found to be contaminated with pesticides and herbicides. The contamination extends from an area 25 feet by 25 feet surrounding the garage drain to a depth of approximately 20 feet. This area contains an estimated 463 cubic yards of contaminated soil. Chlordane was detected at 560 ppm in this area, along with silvex at 2.7 ppm and 4,4-DDT at 28 ppm.

### **Groundwater**

Of the monitoring wells installed during Phase I of the remedial investigation, MW-1 and MW-6 were the only two which showed groundwater exceeding SCGs for VOCs, SVOCs, and pesticides. MW-6 was located directly in the area of highest contamination, associated with the drain on 93 Main Street, and exhibited levels of xylene, 2,4,5-trichlorophenol and dieldrin many times higher than their respective SCGs. Xylene was detected at 130 parts per billion (ppb) in MW-6 along with 2,4,5-trichlorophenol at 440 ppb and dieldrin at 11 ppb. MW-1 was located down gradient and northeast of MW-6. Only pesticide contamination was detected in MW-1, but at levels significantly lower than those in MW-6, such as dieldrin at 1.5 ppb.

During the Phase II investigation contamination was also detected in two of the four newly installed monitoring wells, MW-8 and MW-10. MW-8 and MW-10 are located down gradient of MW 6. MW-8 and MW-10 were also contaminated with low levels of the same pesticides as found during the Phase I in wells MW-1 and MW-6. Overall pesticide levels in the groundwater decline from MW-6 to MW-10. During the most recent round of groundwater sampling MW-6 exhibited dieldrin contamination of 11 ppb and, down gradient, MW-10 exhibited dieldrin contamination of 0.27 ppb.

## **2.4 Summary of Human Exposure Pathways**

This section describes the types of potential human exposures that could present added health risks to persons at or around the site. A more detailed discussion of the exposure can be found in Section 6.3 of the RI report, which can be found in the document repositories listed above.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- Dermal contact could exist as a pathway at the site if the surface soil is removed and the contaminated subsurface soil is exposed.
- Ingestion/dermal contact could exist as a pathway at the site if a drinking water well was installed immediately down gradient of the source areas on 93 Main Street.

## **2.5 Summary of Environmental Assessment**

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. During the RI it was determined that a Fish and Wildlife Impact Assessment was not necessary, due to its urban location and lack of any migration pathways to sensitive environmental areas. No pathways for environmental exposure and/or ecological risks have been identified other than a threat to the sole source aquifer.

## **2.6 Original Remedy**

Upon signing the March 2000 ROD, the NYSDEC selected Alternative 5, Hydraulic Containment and Chemical Oxidation, as the remedy for the site. The elements of that remedy were as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance and monitoring of the remedial program. This would have included batch and/or pilot testing of oxidizing agents.
2. The area surrounding the drywell on the 89-91 Main street property would have been excavated to a depth of six feet. Confirmatory samples would have been collected from the walls and floor of the excavation to insure that all contaminated soil above remedial objectives was removed. Contaminated soil would have been treated on-site and/or disposed of off-site as appropriate.
3. Infiltration galleries would have been constructed, in each of the remaining areas of concern, as necessary to facilitate application of the oxidizing agent to the contaminated subsurface soil. It was anticipated that injection wells would have also been necessary to properly distribute the oxidizing agent to the lower portion of the contaminated subsurface soil. The infiltration galleries would have consisted of an excavated area directly above the area of subsurface soil which would have been filled with gravel, to allow for rapid infiltration of the oxidizing agent. The injection wells would

have been constructed with materials amenable to the oxidizing agent to be used and would have been capable of injecting the oxidizer under pressure, if necessary.

4. Groundwater extraction wells would have been constructed in order to create a zone of hydraulic containment large enough to collect any leachate produced during treatment of the contaminated soil, as well as the natural groundwater flow in the areas being treated. The extraction well(s) would have also been connected to a treatment system which would have allowed for the removal of residual contamination by additional oxidation, carbon treatment or a combination of the two. In the event that hydraulic containment could not have been achieved, alternative methods of groundwater control would have been evaluated such as physical containment (i.e., slurry wall, grout curtain, etc.).
5. Since the remedy would have resulted in the on-site treatment of hazardous waste over a period of time, a long-term monitoring program would have been instituted. Impacted monitoring wells would have continued to be monitored, along with the leachate collected by the hydraulic containment system. Groundwater quality outside the treatment areas was expected to attenuate once the source of contamination is treated or controlled. Monitoring of the leachate collected by the hydraulic containment system would have given an indication of the effectiveness of the chemical oxidation and the volume of untreated contaminants remaining. This program would have allowed the effectiveness of the hydraulic containment and chemical oxidation to be monitored and would have been a component of the operation and maintenance for the site.

### **3.0 DESCRIPTION OF PROPOSED CHANGES**

#### **3.1 New Information**

A pilot study was performed in November 2005 as part of the preliminary design activities. The goal of the pilot study was to determine the parameters of implementing chemical oxidation injection as the remedy for the site. The pilot study consisted of injecting ozone into the subsurface soil and collecting the ozone and contamination by using a soil vapor extraction system. The pilot study included two sampling events, one in January 2006 and the other in July 2006. Based on the results of the two sampling events and the total mass remaining in the test area, it appears that chemical oxidation is not an effective technology to remediate the site because it will not sufficiently reduce the pesticide component of the contamination.

#### **3.2 ROD Changes**

The excavation and off-site disposal remedy will address the VOC, SVOC, and pesticide impacted soil. The areas of concern delineated in Figure 3 will be excavated using conventional methods and equipment. The estimated removal volume is 1,059 cubic yards of soil, from the drywell and the two areas surrounding the two drains. Excavation operations will require the dewatering of the soil, requiring groundwater to be treated on-site by a temporary treatment system. Excavated soils will be transported off-site to an approved disposal facility. This differs from the original remedy that would have treated the waste on-site by hydraulic containment and chemical oxidation.

### **4.0 EVALUATION OF ROD CHANGES**

## 4.1 Remedial Goals

Goals for the cleanup of the site were established in the original ROD and are not being revised by this ROD Amendment. The goals selected for this site are:

- Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.
- Reduce, control, or eliminate to the extent practicable the contamination present within the soils/waste on site.
- Eliminate the threat to the sole source aquifer by removing or treating the source of contamination and curtailing, to the extent possible, migration of contaminated groundwater off the site.
- Eliminate the potential for direct human or animal contact with the contaminated soils or groundwater at the site.
- Attain groundwater standards to the extent practicable.

## 4.2 Evaluation Criteria

The criteria used to compare the remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste disposal sites in New York State (6 NYCRR Part 375). For each criterion, a brief description is provided.

**The first two evaluation criteria are called threshold criteria and must be satisfied in order for an alternative to be considered for selection.**

**1. Protection of Human Health and the Environment.** This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Excavation and Off-Site Disposal will be protective of human health and the environment since contaminated soil will be removed from the site. However, the pilot test showed that the on-site treatment alternative chosen in the March 2000 Record of Decision, "Hydraulic Containment/Chemical Oxidation", is not feasible because chemical oxidation will not completely destroy the pesticide component of the waste and would not have been protective of human health and the environment.

**2. Compliance with New York State Standards, Criteria, and Guidance (SCGs).** Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The primary SCGs to be attained are soil SCGs based on the Department's Cleanup Objectives (Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels." and 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives). Excavation and off-site disposal will achieve soil SCGs. However, the pilot test performed at the site shows that hydraulic containment and chemical oxidation would not meet SCGs for the pesticides in soil.

**The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.**

**3. Short-term Effectiveness.** The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated.

Both alternatives would involve some degree of excavation, although the excavation and handling of contaminated media is relatively minor for Hydraulic Containment/Chemical Oxidation. These actions could potentially impact worker health and safety, the environment, and the local community.

The Excavation and Off-site Disposal alternative will involve hauling contaminated materials offsite. This will involve a short-term risk due to possible spilling of contaminated media offsite. This will be mitigated by properly covering contaminated media and by establishing proper emergency spill response measures.

**4. Long-term Effectiveness and Permanence.** This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Excavation and Off-site Disposal will be effective in the long-term since all likely exposure pathways will be eliminated. This will be achieved by removing the contaminated soil.

It has been demonstrated by the pilot test that Hydraulic Containment/Chemical Oxidation would not be effective in the long-term since all likely exposure pathways would not be eliminated.

**5. Reduction of Toxicity, Mobility or Volume.** Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Excavation and Off-site Disposal will reduce the toxicity, mobility and volume of the soil contaminated with pesticides, VOCs and SVOCs by removing it from the site. Hydraulic Containment/Chemical Oxidation may reduce the toxicity, mobility and volume of the VOCs and SVOCs by treating them in place, but as demonstrated by the pilot study, not sufficiently to meet NYS soil cleanup guidance values.

**6. Implementability.** The technical feasibility and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Hydraulic Containment/Chemical Oxidation would be more difficult to implement than Excavation and Off-site Disposal because it is a more complex remedy that involves an injection and treatment system. Furthermore, the pilot test showed that this on-site treatment alternative chosen in the March 2000 Record of Decision, is not feasible because chemical oxidation will not completely destroy the pesticide component of the waste and will not be protective of human health and the environment. Excavation and Off-site Disposal will be easy to implement using conventional excavation techniques.

**7. Cost-Effectiveness.** Capital costs and annual operation, maintenance, and monitoring costs are

estimated for each alternative, totaled, and then compared on a present worth basis.

The cost of Excavation and Off-site Disposal was the evaluation criterion that originally disqualified this alternative from being selected in the March 2000 ROD. The original present worth cost estimate for Excavation and Off-site Disposal was \$1,849,000, while the estimated present worth to complete Hydraulic Containment/Chemical Oxidation, the remedy selected in the March 2000 ROD, is \$451,000.

However, a recently revised cost estimate for Excavation and Off-site Disposal now estimates the present worth cost for this remedy to be \$528,000. The original cost estimate was based on disposal fees at landfills through out New York State that were permitted to receive this type of hazardous waste. The significant decrease in cost is associated with lower estimated disposal fees considering other disposal options outside of New York State. This new estimate is very close to the original remedy's present worth cost of \$451,000.

Further, Excavation and Off-site Disposal will not leave a source of contamination on-site, which will greatly reduce operation and maintenance (O&M) costs compared to Hydraulic Containment/Chemical Oxidation. O&M for Hydraulic Containment/Chemical Oxidation is estimated for a 5 year period and would cost \$28,600 per year. O&M for Excavation and Off-site Disposal, consisting of groundwater sampling, is also estimated for a 5 year period, but will cost only \$6,500 per year.

With the revised cost estimate, Excavation and Off-Site Disposal appears to be most cost effective alternative of the other alternatives discussed in the March 2000 ROD.

**Record of Decision - March 2000 Cost Estimates**

<b>Remedial Alternative</b>	<b>Capital Cost</b>	<b>Annual OM&amp;M</b>	<b>Total Present Worth</b>
Hydraulic Containment w/ Chemical Oxidation (March 2000 estimate)	\$231,000	\$28,600	\$451,000
Excavation and Off-Site Disposal (March 2000 original estimate)	\$1,829,000	\$4,600	\$1,849,000

**Record of Decision Amendment - August 2006 Cost Estimates**

<b>Remedial Alternative</b>	<b>Capital Cost</b>	<b>Annual OM&amp;M</b>	<b>Total Present Worth</b>
Excavation and Off-Site Disposal (August 2006 revised estimate)	\$500,000	\$6,500	\$528,000

**This final criterion is considered a modifying criterion and is considered after evaluating those above. It is focused upon after public comments on the proposed ROD amendment have been received.**

**8. Community Acceptance.** Concerns of the community regarding the proposed changes were evaluated during the public comment period for this amendment. A responsiveness summary has been prepared that describes public comments received and the manner in which the Department addressed them. The

responsiveness summary can be found as Appendix A to this document.

## **5.0 SUMMARY OF ROD CHANGES**

The Department has amended the Record of Decision (ROD) for the 93 Main Street Site.

The elements of the amended remedy are as follow:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. Excavation and off-site disposal of approximately 1059 cubic yards of contaminated soil (Figure 3). Localized groundwater contamination will be treated on-site by a temporary treatment system as part of the dewatering process during soil excavation.
3. Site restoration by bringing in approved backfill free of industrial and/or other contamination, grading to insure proper drainage, placement of additional topsoil as necessary, and seeding.
4. Implementation of a groundwater monitoring program to document the attenuation of residual groundwater contamination.
5. Development of a site management plan to provide the details of the groundwater monitoring plan.
6. Imposition of an institutional control in the form of an environmental easement that will require (a) compliance with the approved site management plan; (b) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; (c) the property owner or person implementing the remedy to complete and submit to the Department a periodic certification of institutional controls; (d) the property owner or persons implementing the remedy to complete, prior to the development of any occupied structures or buildings on the site, an evaluation of the potential for soil vapor intrusion to occur, including a provision for mitigation of any impacts identified; and (e) limit the use of the property to "restricted-residential use" as defined by 6NYCRR Part 375. The property may also be used for commercial or industrial uses if approved by local zoning.
7. The property owner or person implementing the remedy will provide a periodic certification of institutional controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: (a) contain certification that the institutional controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

## **6.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION**



As part of the 93 Main Street Site environmental restoration process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

1. A repository for documents pertaining to the site was established.
2. A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
3. A factsheet was mailed to the nearby property owners announcing the availability of the proposed ROD amendment and the public meeting.
4. A public meeting was held on May 2, 2007 at the Binghamton State Office Building.
5. A public comment period for the proposed ROD amendment was established, beginning on April 18, 2007 and ending on May 19, 2007.
6. A Responsiveness Summary (Appendix A) was prepared and included as part of this document, to address the comments received during the public comment period for the proposed ROD amendment.

**Table 1**  
**Nature and Extent of Contamination**

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	Benzene	ND to 72	3 of 24	1
		Tetrachloroethene	ND to 34	3 of 24	5
		Chlorobenzene	ND to 120	3 of 24	5
		Ethylbenzene	ND to 120	3 of 24	5
		1,2-Dichloroethane	ND to 83	4 of 24	0.6
		Toluene	ND to 89	3 of 24	5
		Xylene	ND to 650	3 of 24	5
Groundwater	Semivolatile Organic Compounds (SVOCs)	2,4-Dichlorophenol	ND to 1,400	4 of 24	5
		Naphthalene	ND to 140	2 of 24	10
		2,4,5-Trichlorophenol	ND to 1,500	4 of 24	1
		Pentachlorophenol	ND to 25	2 of 24	1
		Phenol	ND to 2	1 of 24	1
		2-Chlorophenol	ND to 5	1 of 24	1
		1,4-Dichlorobenzene	ND to 4	1 of 24	3
		2-Methylphenol	ND to 2	1 of 24	1
		4 - Methylphenol	ND to 4	1 of 24	1
		benzo(a)anthracene	ND to 1	1 of 24	0.002
		Chrysene	ND to 1	1 of 24	0.002
		Bis(2-Ethylhexyl)-phthalate	ND to 7	1 of 24	5
		Benzo(b)fluoranthene	ND to 2	1 of 24	0.002
		Benzo(a)pyrene	ND to 1	1 of 24	ND
Groundwater	Pesticides	Endrin	ND to 0.15	2 of 24	ND
		Beta-BHC	ND to 0.89	5 of 24	0.04
		Lindane	ND to 91	3 of 24	0.05
		Aplha-BHC	ND to 1.5	1 of 24	0.01

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Pesticides	Delta-BHC	ND to 1.2	4 of 24	0.04
		Heptachlor Epoxide	ND to 0.11	3 of 24	0.03
		Dieldrin	ND to 13	7 of 24	0.004
		Chlordane	ND to 1	3 of 24	0.05
Groundwater	Herbicides	Dicamba	ND to 3	3 of 24	0.44
Groundwater	Metals	Sodium	ND to 60,200	4 of 24	20,000

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCG (ppm)
Soil	Volatile Organic Compounds (VOCs)	Chlorobenzene	ND to 3.2	1 of 16	1.7
		Ethylbenzene	ND to 17	1 of 16	5.5
		Xylene	ND to 100	2 of 16	1.2
Soil	Semivolatile Organic Compounds (SVOCs)	1,2,4-Trichlorobenzene	ND to 24	2 of 16	3.4
		Naphthalene	ND to 30	2 of 16	13
		2-Methylnaphthalene	ND to 190	1 of 16	36
		2,4,5-Trichlorophenol	ND to 7	1 of 16	0.1
		4-Nitrophenol	ND to 2.6	1 of 16	0.1
		Benzo(a)anthracene	ND to 0.7	2 of 16	0.224
		Chrysene	ND to 0.57	3 of 16	0.4
		Benzo(b)fluoranthene	ND to 0.88	5 of 16	0.224
		Benzo(k)fluoranthene	ND to 0.45	3 of 16	0.224
		Benzo(a)pyrene	ND to 0.54	6 of 16	0.061
		Dibenz(a,h)anthracene	ND to 0.28	3 of 16	0.014

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCG (ppm)
Soil	Pesticides	Heptachlor	ND to 22	5 of 16	0.1
		Heptachlor Epoxide	ND to 8.3	5 of 16	0.02
		Dieldrin	ND to 97	4 of 16	0.044
		4,4'-DDE	ND to 24	6 of 16	2.1
		Endrin	ND to 37	5 of 16	0.1
		Endosulfan II	ND to 1	1 of 16	0.90
		Endosulfan I	ND to 8.2	1 of 16	0.90
		Alpha-BHC	ND to 5.6	5 of 16	0.11
		Beta-BHC	ND to 5.6	3 of 16	0.2
		Delta-BHC	ND to 12	6 of 16	0.3
		Lindane	ND to 44	8 of 16	0.06
		Aldrin	ND to 46	6 of 16	0.041
		4,4'-DDT	ND to 150	9 of 16	2.1
		Chlordane	ND to 560	8 of 16	0.54
Soil	Metals	Arsenic	ND to 39	4 of 16	7.5
		Beryllium	ND to 0.5	7 of 16	0.16
		Copper	ND to 81	5 of 16	25
		Iron	ND to 34,200	7 of 16	2,000
		Mercury	ND to 1.1	4 of 16	0.1
		Zinc	ND to 416	7 of 16	20
		Nickel	ND to 20	3 of 16	13

# **APPENDIX A**

## **Responsiveness Summary**

# RESPONSIVENESS SUMMARY

**93 Main Street  
Proposed Record of Decision Amendment  
City of Binghamton, Broome County  
Site No. 7-04-027**

The Proposed Record of Decision Amendment for the 93 Main Street site was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on April 10, 2007. This Proposed Record of Decision Amendment outlined the preferred remedial measure proposed for the remediation of the contaminated soil at the 93 Main Street site. The preferred remedy is excavation of the pesticide contaminated soils and institutional controls.

The release of the Proposed Record of Decision Amendment was announced via a notice to the mailing list, informing the public of the document's availability.

A public meeting was held on May 2, 2007 which included a presentation of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site.

The public comment period for the Proposed Record of Decision Amendment ended on May 19, 2007.

This Responsiveness Summary responds to all questions and comments raised at the May 2, 2007 public meeting. There were no written comments received.

The following are the comments received at the public meeting, with the NYSDEC's and NYSDOH's responses:

**COMMENT 1:** How does this site compare to the Endicott site?

**RESPONSE 1:** The Endicott site is a much larger site that has impacted a much larger area with higher concentrations of VOCs than the 93 Main St. site, ~~has~~. The 93 Main St. site is a much smaller and less complicated project than Endicott.

*Different contaminants - pesticides  
plume*

**COMMENT 2:** Could the contamination at the site get worse and is it leaving the site?

**RESPONSE 2:** No, the contamination will not increase. The highest levels of the contamination are in the soil on site. A groundwater plume has migrated off site according to groundwater samples collected during the 1998 and 1999 sampling events. However, the Pre-Design groundwater samples collected during 2005 show that the contaminants in the groundwater are naturally attenuating and the concentrations of the contamination have decreased to levels below New York State Groundwater Standards at the edge of the plume. The groundwater contamination at this time is localized to the site.

**COMMENT 3:** What can be built on the property with a “restricted-residential use” easement?

**RESPONSE 3:** "Restricted-residential use" prohibits single family housing and any vegetable gardens, although community vegetable gardens may be considered with Department approval. Any other construction and re-use is permitted, including active recreational uses, which are public uses with a reasonable potential for soil contact.

**COMMENT 4:** If the City of Binghamton takes title to the land would it have to pay for the remedial work performed under the Superfund Program?

**RESPONSE 4:** At this time the City of Binghamton is not the title holder or a potential responsible party (PRP) under the law and therefore, not required to pay for past costs. Eventually if no PRP pays for past costs associated with the site, a lien will most likely be placed on the real property. With regard to Institutional Controls, should the city take title to the property it will be subject to any environmental easements.

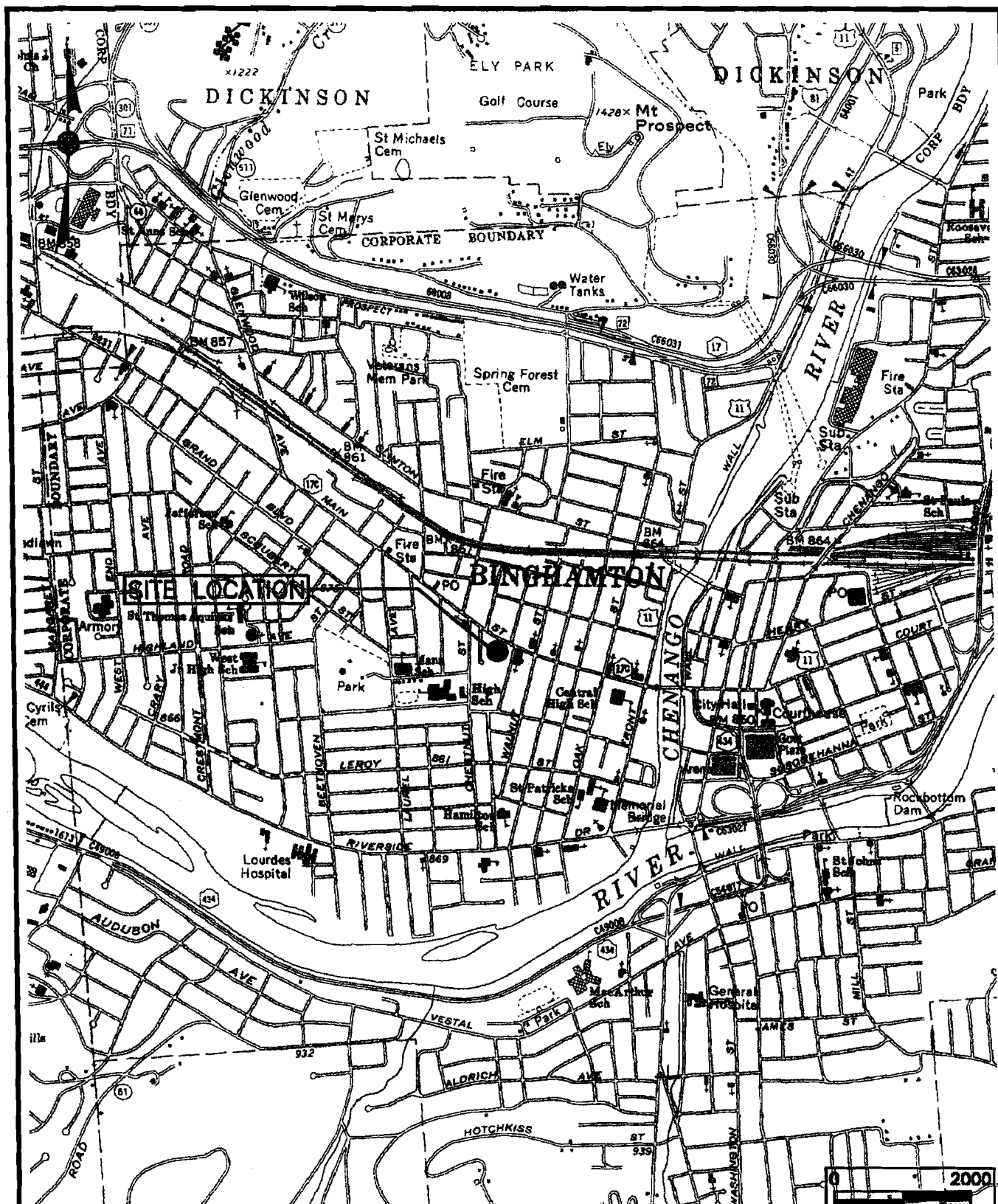
*DEB  
Renew*

**COMMENT 5:** What can the members of the City of Binghamton Council do to help the project along?

**RESPONSE 5:** Actively participating, like you are doing here tonight, will help the project.

**COMMENT 6:** What will happen next? When will the remedy be implemented?

**RESPONSE 6:** After the Amended Record of Decision is finalized, the project can proceed through remedial design, and a construction contract can be developed, put out for bid, and awarded. At this time, it is anticipated that the bid will be awarded and the remedy will be implemented in the Spring of 2008.



SOURCE: UNITED STATES GEOLOGICAL SURVEY BINGHAMTON WEST QUADRANGLE

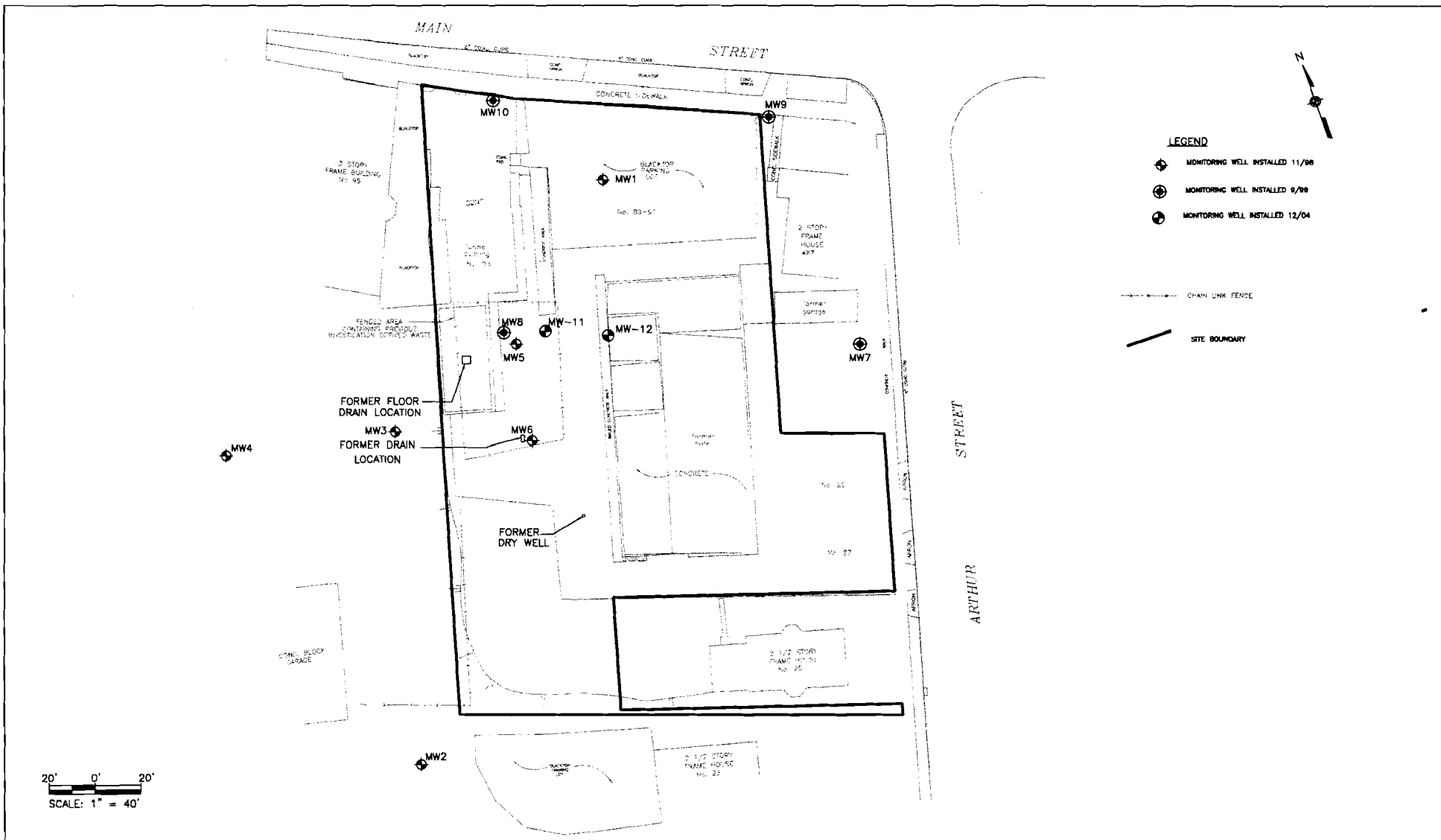
93 MAIN STREET SITE REMEDIAL DESIGN  
BINGHAMTON, NEW YORK

SITE LOCATION MAP

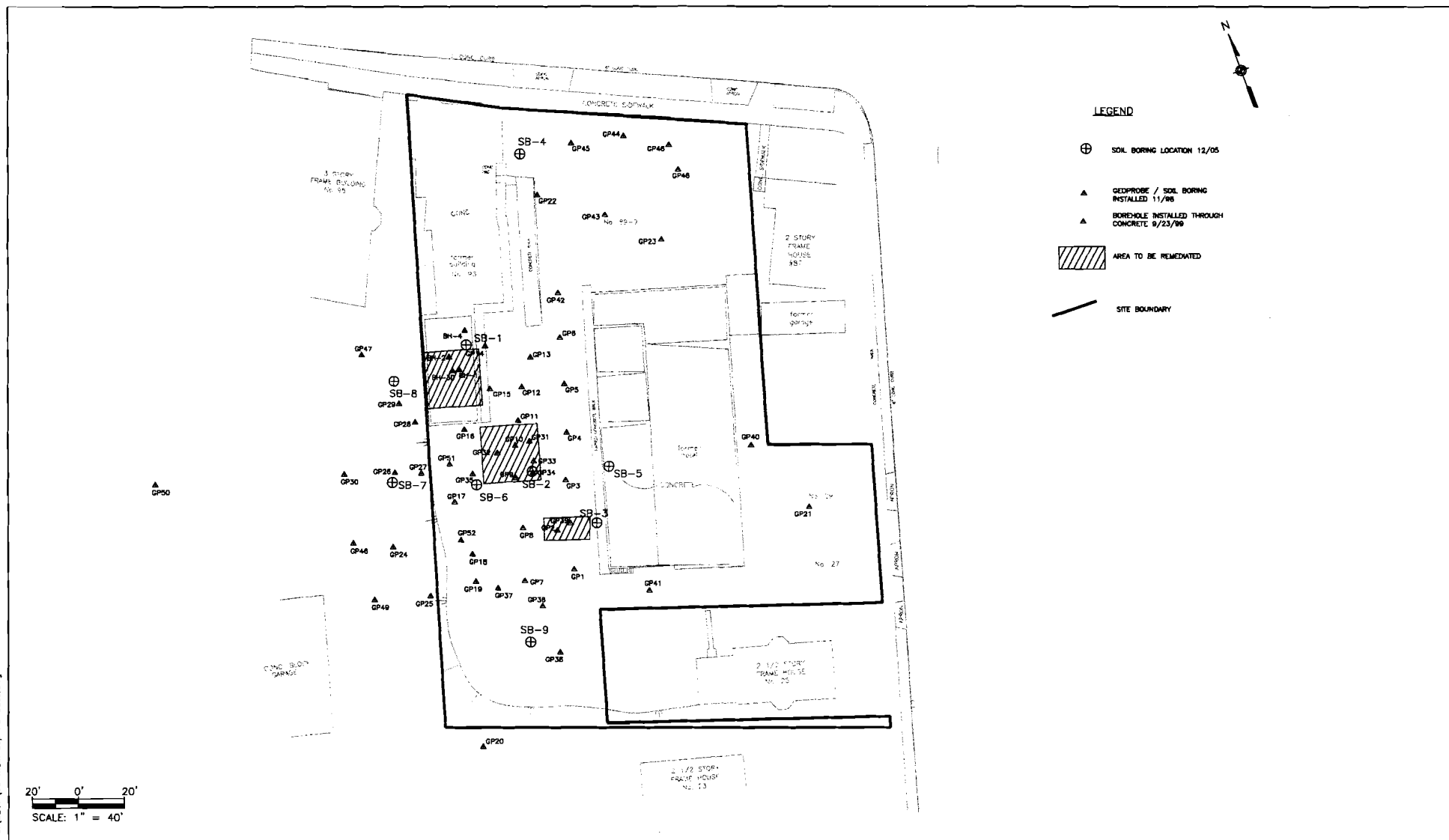
**db** Dvirka  
and  
Bartilucci  
CONSULTING ENGINEERS  
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

FIGURE 1





JAN 31, 2005 SEP C:\2217\93 main sep RD base.dwg



**db** Dvirka and Bartilucci  
Consulting Engineers  
A Division of William F. Cosulich Associates, P.C.

FIGURE 3

## WordPerfect Document Compare Summary

Original document: C:\Section B\Sarnowicz\93 Main Street RODAmendment 06-11-07 revision.wpd

Revised document: @PFDesktop\MyComputer\C:\Section B\Sarnowicz\93 Main Street Final RODAmendment 06-21-07 revision.wpd

Deletions are shown with the following attributes and color:

~~Strikeout~~, Blue RGB(0,0,255).

Deleted text is shown as full text.

Insertions are shown with the following attributes and color:

Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 5 Deletions, 5 Insertions, 0 Moves.

# RECORD OF DECISION AMENDMENT

## 93 MAIN STREET SITE



Binghamton / Broome County / Registry No. 7-04-027 June 2007

Prepared by the New York State Department of Environmental Conservation  
Division of Environmental Remediation

### 1.0 INTRODUCTION

On March 27, 2000, the New York State Department of Environmental Conservation (Department) signed a Record of Decision (ROD) which selected a remedy to cleanup the 93 Main Street Site. The ROD signed in March 2000 chose "Hydraulic Containment and Chemical Oxidation" as the remedy for the site based on the evaluating criteria presented in the Remedial Feasibility Study. However, since the remedy selection, a pilot study was implemented at the site to gather data to design the chemical oxidation remedy. The pilot study concluded that even though chemical oxidation may reduce the volatile organic compound (VOC) and semi-volatile organic compound (SVOC) contamination at the site, chemical oxidation could not remediate the pesticide contamination at the site to meet the remedial goals of the ROD.

In response, a revised cost estimate for an alternate remedy, Excavation and Off-site Disposal, was developed. Based on the new and significantly lower cost estimate, the Department has elected to change the remedy for the 93 Main Street site to "Excavation and Off-Site Disposal".

A public comment period was scheduled from April 18, 2007 to May 19, 2007 and a public meeting was held at 7:00 PM on May 2 at the Binghamton State Office Building.

### 2.0 SITE INFORMATION

#### 2.1 Site Description

The 93 Main Street Site consists of four parcels of land, 89-91 and 93 Main Street and 27 and 29 Arthur Street, located in the City of Binghamton, Broome County (Figure 1). An abandoned former apartment building existed on the 93 Main Street parcel and a partially completed motel building existed on the 89-91 Main Street parcels. Both of these deteriorated structures were demolished by the city of Binghamton in September of 1999. The 93 Main Street parcel was at one time home to the McMahon Brothers Pest Control company. The areas of contamination are centered around a dry well located on 89-91 Main Street and two drains on 93 Main Street. Figure 2 shows the properties described above. The surrounding area is a mix of residential and commercial buildings.

#### 2.2 Site History

From the 1950's to the 1980's the McMahon Brothers Pest Control company operated at the 93 Main Street Site. It was reported that the site was used as a pesticide/herbicide storage and handling location for the company. There were also allegations of spills having taken place at the site.

In 1995 Gaynor Associates of Cortland, NY performed a Phase II environmental audit on the 93 Main Street

property for a financial institution. The results of the investigation revealed elevated concentrations of herbicides and pesticides in the subsurface soil, specifically 2,4,5-trichlorophenol at 12,000 parts per million (ppm); 2,4-dichlorophenol at 4,030 ppm; and chlordane at 15,000 ppm.

During the investigation, Gaynor determined that a back area of the building had been used by McMahon for pesticide storage and handling. This area had since been converted to apartments, and the concrete floor covered with tile or carpet. During the Gaynor study, strong pesticide odors were noted in the vacant apartments, which were in serious disrepair.

In 1995 the City, in response to these and other complaints, entered into a Voluntary Cleanup Agreement (VCA) with the NYSDEC in order to perform a limited investigation of the site. This investigation focused on the rear of the 93 Main Street building and consisted of Geoprobe® sampling of the soil and groundwater. The results of this investigation revealed elevated concentrations of pesticides/herbicides such as chlordane, aldrin, dieldrin, and 2,4,5-Trichlorophenol in the Site's groundwater and/or subsurface soil which exceeded applicable standard, criteria, or guidance values (SCGs). The presence of these pesticides indicate a threat to the area's sole source aquifer and was the basis for the Site's class "2" designation on the New York State Registry of Inactive Hazardous Waste Disposal Sites.

In October 1998 NYSDEC initiated a Remedial Investigation/Feasibility Study (RI/FS) at the site to define the nature and extent of the contamination and develop remedial alternatives which would be protective of human health and the environment.

The Record of Decision for the site, calling for Hydraulic Containment and Chemical Oxidation, was issued by the New York State Department of Environmental Conservation in March 2000.

### **2.3 Nature and Extent of Site Contamination**

As described in the original ROD and other documents, many soil, groundwater and sediment samples were collected at the site to characterize the nature and extent of contamination. The primary contaminants of concern include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and pesticides.

The VOC contaminants of concern are xylene, ethylbenzene, chlorobenzene, and 1,2-dichloroethane.

The SVOC contaminants of concern are 1,2,4-trichlorobenzene, naphthalene, 2-methylnaphthalene, 2,4,5-trichlorophenol, 2,4-dichlorophenol, pentachlorophenol, phenol, 2-chlorophenol, 1,4-dichlorobenzene, 2-methylphenol, bis(2-ethylhexyl)phthalate and 4-nitrophenol. Other SVOC contaminants of concern include the carcinogenic polycyclic aromatic hydrocarbons (PAHs), benzo(a)anthracene, benzo(k)anthracene, chrysene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene.

The pesticide contaminants of concern are lindane, aldrin, dieldrin, 4,4'-DDT, 4,4-DDD, 4,4'-DDE, heptachlor, heptachlor epoxide, 2,4-D, chlordane, 4,4'-DDE, endrin, endosulfan I, endosulfan II, beta-BHC, and delta-BHC. These are all listed hazardous wastes and some, such as DDT and chlordane, have been banned from use as pesticides.

## Soil

Three areas of subsurface soil contamination were identified at the 93 Main Street site. One area, the drywell, is located on the 89-91 Main Street property. The other two areas, the drain and the former garage area, are located on the 93 Main Street property.

An extensive survey of the remainder of the site did not identify any other areas of subsurface contamination. Since the site was either covered by buildings or paved, limited surface soil sampling was conducted, which determined that surface soils were not contaminated. However, the buildings were demolished shortly after the RI/FS was complete. Additional soil and groundwater samples were collected during the design that redefined the limits of contamination. This sampling data gathered during the design was used to determine the area that needs to be remediated. Table 1 contains the contaminants that exceeded SCGs for soil and groundwater and their corresponding guidance values and standards.

The drywell area consists primarily of subsurface pesticide contamination. The contaminated area is approximately a 10 foot by 20 foot area of the ground surface that extends to a depth of approximately 18 feet. This area contains approximately 133 cubic yards of contaminated soil. In this area the predominate contaminant was chlordane which was detected at 149 parts per million (ppm).

In the area of the former drain on the 93 Main Street parcel, subsurface soils are contaminated with pesticides and petroleum products. Contamination extends from a 25 foot by 25 foot area of the ground surface to depth of 20 feet. The total volume of contaminated soil in this area is estimated to be approximately 463 cubic yards. Chlordane was detected in this area at up to 490 ppm and xylene was also detected at 100 ppm. Lindane, aldrin, 4,4-DDD, and 4,4-DDT were also detected at concentrations orders of magnitude higher than their respective SCGs.

Demolition of the 93 Main Street building revealed a floor drain in the slab of the garage floor. Subsurface soil samples taken from this area were found to be contaminated with pesticides and herbicides. The contamination extends from an area 25 feet by 25 feet surrounding the garage drain to a depth of approximately 20 feet. This area contains an estimated 463 cubic yards of contaminated soil. Chlordane was detected at 560 ppm in this area, along with silvex at 2.7 ppm and 4,4-DDT at 28 ppm.

## Groundwater

Of the monitoring wells installed during Phase I of the remedial investigation, MW-1 and MW-6 were the only two which showed groundwater exceeding SCGs for VOCs, SVOCs, and pesticides. MW-6 was located directly in the area of highest contamination, associated with the drain on 93 Main Street, and exhibited levels of xylene, 2,4,5-trichlorophenol and dieldrin many times higher than their respective SCGs. Xylene was detected at 130 parts per billion (ppb) in MW-6 along with 2,4,5-trichlorophenol at 440 ppb and dieldrin at 11 ppb. MW-1 was located down gradient and northeast of MW-6. Only pesticide contamination was detected in MW-1, but at levels significantly lower than those in MW-6, such as dieldrin at 1.5 ppb.

During the Phase II investigation contamination was also detected in two of the four newly installed monitoring wells, MW-8 and MW-10. MW-8 and MW-10 are located down gradient of MW 6. MW-8 and MW-10 were also contaminated with low levels of the same pesticides as found during the Phase I in wells MW-1 and MW-6. Overall pesticide levels in the groundwater decline from MW-6 to MW-10. During the most recent round of groundwater sampling MW-6 exhibited dieldrin contamination of 11 ppb and, down

gradient, MW-10 exhibited dieldrin contamination of 0.27 ppb.

## **2.4 Summary of Human Exposure Pathways**

This section describes the types of potential human exposures that could present added health risks to persons at or around the site. A more detailed discussion of the exposure can be found in Section 6.3 of the RI report, which can be found in the document repositories listed above.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- Dermal contact could exist as a pathway at the site if the surface soil is removed and the contaminated subsurface soil is exposed.
- Ingestion/dermal contact could exist as a pathway at the site if a drinking water well was installed immediately down gradient of the source areas on 93 Main Street.

## **2.5 Summary of Environmental Assessment**

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. During the RI it was determined that a Fish and Wildlife Impact Assessment was not necessary, due to its urban location and lack of any migration pathways to sensitive environmental areas. No pathways for environmental exposure and/or ecological risks have been identified other than a threat to the sole source aquifer.

## **2.6 Original Remedy**

Upon signing the March 2000 ROD, the NYSDEC selected Alternative 5, Hydraulic Containment and Chemical Oxidation, as the remedy for the site. The elements of that remedy were as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance and monitoring of the remedial program. This would have included batch and/or pilot testing of oxidizing agents.
2. The area surrounding the drywell on the 89-91 Main street property would have been excavated to a depth of six feet. Confirmatory samples would have been collected from the walls and floor of the excavation to insure that all contaminated soil above remedial objectives was removed. Contaminated soil would have been treated on-site and/or disposed of off-site as appropriate.
3. Infiltration galleries would have been constructed, in each of the remaining areas of concern, as necessary to facilitate application of the oxidizing agent to the contaminated subsurface soil. It was anticipated that injection wells would have also been necessary to properly distribute the oxidizing agent to the lower portion of the contaminated subsurface soil. The infiltration galleries would have consisted of an excavated area directly above the area of subsurface soil which would have been

filled with gravel, to allow for rapid infiltration of the oxidizing agent. The injection wells would have been constructed with materials amenable to the oxidizing agent to be used and would have been capable of injecting the oxidizer under pressure, if necessary.

4. Groundwater extraction wells would have been constructed in order to create a zone of hydraulic containment large enough to collect any leachate produced during treatment of the contaminated soil, as well as the natural groundwater flow in the areas being treated. The extraction well(s) would have also been connected to a treatment system which would have allowed for the removal of residual contamination by additional oxidation, carbon treatment or a combination of the two. In the event that hydraulic containment could not have been achieved, alternative methods of groundwater control would have been evaluated such as physical containment (i.e., slurry wall, grout curtain, etc.).
5. Since the remedy would have resulted in the on-site treatment of hazardous waste over a period of time, a long-term monitoring program would have been instituted. Impacted monitoring wells would have continued to be monitored, along with the leachate collected by the hydraulic containment system. Groundwater quality outside the treatment areas was expected to attenuate once the source of contamination is treated or controlled. Monitoring of the leachate collected by the hydraulic containment system would have given an indication of the effectiveness of the chemical oxidation and the volume of untreated contaminants remaining. This program would have allowed the effectiveness of the hydraulic containment and chemical oxidation to be monitored and would have been a component of the operation and maintenance for the site.

### **3.0 DESCRIPTION OF PROPOSED CHANGES**

#### **3.1 New Information**

A pilot study was performed in November 2005 as part of the preliminary design activities. The goal of the pilot study was to determine the parameters of implementing chemical oxidation injection as the remedy for the site. The pilot study consisted of injecting ozone into the subsurface soil and collecting the ozone and contamination by using a soil vapor extraction system. The pilot study included two sampling events, one in January 2006 and the other in July 2006. Based on the results of the two sampling events and the total mass remaining in the test area, it appears that chemical oxidation is not an effective technology to remediate the site because it will not sufficiently reduce the pesticide component of the contamination.

#### **3.2 ROD Changes**

The excavation and off-site disposal remedy will address the VOC, SVOC, and pesticide impacted soil. The areas of concern delineated in Figure 3 will be excavated using conventional methods and equipment. The estimated removal volume is 1,059 cubic yards of soil, from the drywell and the two areas surrounding the two drains. Excavation operations will require the dewatering of the soil, requiring groundwater to be treated on-site by a temporary treatment system. Excavated soils will be transported off-site to an approved disposal facility. This differs from the original remedy that would have treated the waste on-site by hydraulic containment and chemical oxidation.



## **4.0 EVALUATION OF ROD CHANGES**

### **4.1 Remedial Goals**

Goals for the cleanup of the site were established in the original ROD and are not being revised by this ROD Amendment. The goals selected for this site are:

- Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.
- Reduce, control, or eliminate to the extent practicable the contamination present within the soils/waste on site.
- Eliminate the threat to the sole source aquifer by removing or treating the source of contamination and curtailing, to the extent possible, migration of contaminated groundwater off the site.
- Eliminate the potential for direct human or animal contact with the contaminated soils or groundwater at the site.
- Attain groundwater standards to the extent practicable.

### **4.2 Evaluation Criteria**

The criteria used to compare the remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste disposal sites in New York State (6 NYCRR Part 375). For each criterion, a brief description is provided.

**The first two evaluation criteria are called threshold criteria and must be satisfied in order for an alternative to be considered for selection.**

**1. Protection of Human Health and the Environment.** This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Excavation and Off-Site Disposal will be protective of human health and the environment since contaminated soil will be removed from the site. However, the pilot test showed that the on-site treatment alternative chosen in the March 2000 Record of Decision, "Hydraulic Containment/Chemical Oxidation", is not feasible because chemical oxidation will not completely destroy the pesticide component of the waste and would not have been protective of human health and the environment.

**2. Compliance with New York State Standards, Criteria, and Guidance (SCGs).** Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The primary SCGs to be attained are soil SCGs based on the Department's Cleanup Objectives (Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels." and 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives).

Excavation and off-site disposal will achieve soil SCGs. However, the pilot test performed at the site shows that hydraulic containment and chemical oxidation would not meet SCGs for the pesticides in soil.

**The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.**

**3. Short-term Effectiveness.** The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated.

Both alternatives would involve some degree of excavation, although the excavation and handling of contaminated media is relatively minor for Hydraulic Containment/Chemical Oxidation. These actions could potentially impact worker health and safety, the environment, and the local community.

The Excavation and Off-site Disposal alternative will involve hauling contaminated materials offsite. This will involve a short-term risk due to possible spilling of contaminated media offsite. This will be mitigated by properly covering contaminated media and by establishing proper emergency spill response measures.

**4. Long-term Effectiveness and Permanence.** This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Excavation and Off-site Disposal will be effective in the long-term since all likely exposure pathways will be eliminated. This will be achieved by removing the contaminated soil.

It has been demonstrated by the pilot test that Hydraulic Containment/Chemical Oxidation would not be effective in the long-term since all likely exposure pathways would not be eliminated.

**5. Reduction of Toxicity, Mobility or Volume.** Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Excavation and Off-site Disposal will reduce the toxicity, mobility and volume of the soil contaminated with pesticides, VOCs and SVOCs by removing it from the site. Hydraulic Containment/Chemical Oxidation may reduce the toxicity, mobility and volume of the VOCs and SVOCs by treating them in place, but as demonstrated by the pilot study, not sufficiently to meet NYS soil cleanup guidance values.

**6. Implementability.** The technical feasibility and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Hydraulic Containment/Chemical Oxidation would be more difficult to implement than Excavation and Off-site Disposal because it is a more complex remedy that involves an injection and treatment system. Furthermore, the pilot test showed that this on-site treatment alternative chosen in the March 2000 Record of Decision, is not feasible because chemical oxidation will not completely destroy the pesticide component of the waste and will not be protective of human health and the environment. Excavation and Off-site

Disposal will be easy to implement using conventional excavation techniques.

**7. Cost-Effectiveness.** Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative, totaled, and then compared on a present worth basis.

The cost of Excavation and Off-site Disposal was the evaluation criterion that originally disqualified this alternative from being selected in the March 2000 ROD. The original present worth cost estimate for Excavation and Off-site Disposal was \$1,849,000, while the estimated present worth to complete Hydraulic Containment/Chemical Oxidation, the remedy selected in the March 2000 ROD, is \$451,000.

However, a recently revised cost estimate for Excavation and Off-site Disposal now estimates the present worth cost for this remedy to be \$528,000. The original cost estimate was based on disposal fees at landfills through out New York State that were permitted to receive this type of hazardous waste. The significant decrease in cost is associated with lower estimated disposal fees considering other disposal options outside of New York State. This new estimate is very close to the original remedy's present worth cost of \$451,000.

Further, Excavation and Off-site Disposal will not leave a source of contamination on-site, which will greatly reduce operation and maintenance (O&M) costs compared to Hydraulic Containment/Chemical Oxidation. O&M for Hydraulic Containment/Chemical Oxidation is estimated for a 5 year period and would cost \$28,600 per year. O&M for Excavation and Off-site Disposal, consisting of groundwater sampling, is also estimated for a 5 year period, but will cost only \$6,500 per year.

With the revised cost estimate, Excavation and Off-Site Disposal appears to be most cost effective alternative of the other alternatives discussed in the March 2000 ROD.

**Record of Decision - March 2000 Cost Estimates**

<b>Remedial Alternative</b>	<b>Capital Cost</b>	<b>Annual OM&amp;M</b>	<b>Total Present Worth</b>
Hydraulic Containment w/ Chemical Oxidation (March 2000 estimate)	\$231,000	\$28,600	\$451,000
Excavation and Off-Site Disposal (March 2000 original estimate)	\$1,829,000	\$4,600	\$1,849,000

**Record of Decision Amendment - August 2006 Cost Estimates**

<b>Remedial Alternative</b>	<b>Capital Cost</b>	<b>Annual OM&amp;M</b>	<b>Total Present Worth</b>
Excavation and Off-Site Disposal (August 2006 revised estimate)	\$500,000	\$6,500	\$528,000

**This final criterion is considered a modifying criterion and is considered after evaluating those above. It is focused upon after public comments on the proposed ROD amendment have been received.**

**8. Community Acceptance.** Concerns of the community regarding the proposed changes were evaluated during the public comment period for this amendment. A responsiveness summary has been prepared that describes public comments received and the manner in which the Department addressed them. The responsiveness summary can be found as Appendix A to this document.

## **5.0 SUMMARY OF ROD CHANGES**

The Department has amended the Record of Decision (ROD) for the 93 Main Street Site.

The elements of the amended remedy are as follow:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. Excavation and off-site disposal of approximately 1059 cubic yards of contaminated soil (Figure 3). Localized groundwater contamination will be treated on-site by a temporary treatment system as part of the dewatering process during soil excavation.
3. Site restoration by bringing in approved backfill free of industrial and/or other contamination, grading to insure proper drainage, placement of additional topsoil as necessary, and seeding.
4. Implementation of a groundwater monitoring program to document the attenuation of residual groundwater contamination.
5. Development of a site management plan to provide the details of the groundwater monitoring plan.
6. Imposition of an institutional control in the form of an environmental easement that will require (a) compliance with the approved site management plan; (b) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; (c) the property owner or person implementing the remedy to complete and submit to the Department a periodic certification of institutional controls; (d) the property owner or persons implementing the remedy to complete, prior to the development of any occupied structures or buildings on the site, an evaluation of the potential for soil vapor intrusion to occur, including a provision for mitigation of any impacts identified; and (e) limit the use of the property to "restricted-residential use" as defined by 6NYCRR Part 375. The property may also be used for commercial or industrial uses if approved by local zoning.
7. The property owner or person implementing the remedy will provide a periodic certification of institutional controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: (a) contain certification that the institutional controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

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## **6.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION**

As part of the 93 Main Street Site environmental restoration process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

1. A repository for documents pertaining to the site was established.
2. A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
3. A factsheet was mailed to the nearby property owners announcing the availability of the proposed ROD amendment and the public meeting.
4. A public meeting was held on May 2, 2007 at the Binghamton State Office Building.
5. A public comment period for the proposed ROD amendment was established, beginning on April 18, 2007 and ending on May 19, 2007.
6. A Responsiveness Summary (Appendix A) was prepared and included as part of this document, to address the comments received during the public comment period for the proposed ROD amendment.

**Table 1**  
**Nature and Extent of Contamination**

<b>MEDIUM</b>	<b>CATEGORY</b>	<b>CONTAMINANT OF CONCERN</b>	<b>DETECTED CONCENTRATION RANGE (ppb)</b>	<b>FREQUENCY of EXCEEDING SCGs</b>	<b>SCG (ppb)</b>
Groundwater	Volatile Organic Compounds (VOCs)	Benzene	ND to 72	3 of 24	1
		Tetrachloroethene	ND to 34	3 of 24	5
		Chlorobenzene	ND to 120	3 of 24	5
		Ethylbenzene	ND to 120	3 of 24	5
		1,2-Dichloroethane	ND to 83	4 of 24	0.6
		Toluene	ND to 89	3 of 24	5
		Xylene	ND to 650	3 of 24	5
Groundwater	Semivolatile Organic Compounds (SVOCs)	2,4-Dichlorophenol	ND to 1,400	4 of 24	5
		Naphthalene	ND to 140	2 of 24	10
		2,4,5-Trichlorophenol	ND to 1,500	4 of 24	1
		Pentachlorophenol	ND to 25	2 of 24	1
		Phenol	ND to 2	1 of 24	1
		2-Chlorophenol	ND to 5	1 of 24	1
		1,4-Dichlorobenzene	ND to 4	1 of 24	3
		2-Methylphenol	ND to 2	1 of 24	1
		4 - Methylphenol	ND to 4	1 of 24	1
		benzo(a)anthracene	ND to 1	1 of 24	0.002
		Chrysene	ND to 1	1 of 24	0.002
		Bis(2-Ethylhexyl)- phthalate	ND to 7	1 of 24	5
		Benzo(b)fluoranthene	ND to 2	1 of 24	0.002
		Benzo(a)pyrene	ND to 1	1 of 24	ND
Groundwater	Pesticides	Endrin	ND to 0.15	2 of 24	ND
		Beta-BHC	ND to 0.89	5 of 24	0.04
		Lindane	ND to 91	3 of 24	0.05
		Alpha-BHC	ND to 1.5	1 of 24	0.01

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Pesticides	Delta-BHC	ND to 1.2	4 of 24	0.04
		Heptachlor Epoxide	ND to 0.11	3 of 24	0.03
		Dieldrin	ND to 13	7 of 24	0.004
		Chlordane	ND to 1	3 of 24	0.05
Groundwater	Herbicides	Dicamba	ND to 3	3 of 24	0.44
Groundwater	Metals	Sodium	ND to 60,200	4 of 24	20,000

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCG (ppm)
Soil	Volatile Organic Compounds (VOCs)	Chlorobenzene	ND to 3.2	1 of 16	1.7
		Ethylbenzene	ND to 17	1 of 16	5.5
		Xylene	ND to 100	2 of 16	1.2
Soil	Semivolatile Organic Compounds (SVOCs)	1,2,4-Trichlorobenzene	ND to 24	2 of 16	3.4
		Naphthalene	ND to 30	2 of 16	13
		2-Methylnaphthalene	ND to 190	1 of 16	36
		2,4,5-Trichlorophenol	ND to 7	1 of 16	0.1
		4-Nitrophenol	ND to 2.6	1 of 16	0.1
		Benzo(a)anthracene	ND to 0.7	2 of 16	0.224
		Chrysene	ND to 0.57	3 of 16	0.4
		Benzo(b)fluoranthene	ND to 0.88	5 of 16	0.224
		Benzo(k)fluoranthene	ND to 0.45	3 of 16	0.224
		Benzo(a)pyrene	ND to 0.54	6 of 16	0.061
		Dibenz(a,h)anthracene	ND to 0.28	3 of 16	0.014

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	DETECTED CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCG (ppm)
Soil	Pesticides	Heptachlor	ND to 22	5 of 16	0.1
		Heptachlor Epoxide	ND to 8.3	5 of 16	0.02
		Dieldrin	ND to 97	4 of 16	0.044
		4,4'-DDE	ND to 24	6 of 16	2.1
		Endrin	ND to 37	5 of 16	0.1
		Endosulfan II	ND to 1	1 of 16	0.90
		Endosulfan I	ND to 8.2	1 of 16	0.90
		Alpha-BHC	ND to 5.6	5 of 16	0.11
		Beta-BHC	ND to 5.6	3 of 16	0.2
		Delta-BHC	ND to 12	6 of 16	0.3
		Lindane	ND to 44	8 of 16	0.06
		Aldrin	ND to 46	6 of 16	0.041
		4,4'-DDT	ND to 150	9 of 16	2.1
		Chlordane	ND to 560	8 of 16	0.54
Soil	Metals	Arsenic	ND to 39	4 of 16	7.5
		Beryllium	ND to 0.5	7 of 16	0.16
		Copper	ND to 81	5 of 16	25
		Iron	ND to 34,200	7 of 16	2,000
		Mercury	ND to 1.1	4 of 16	0.1
		Zinc	ND to 416	7 of 16	20
		Nickel	ND to 20	3 of 16	13



# **APPENDIX A**

## **Responsiveness Summary**

# RESPONSIVENESS SUMMARY

**93 Main Street  
Proposed Record of Decision Amendment  
City of Binghamton, Broome County  
Site No. 7-04-027**

The Proposed Record of Decision Amendment for the 93 Main Street site was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on April 10, 2007. This Proposed Record of Decision Amendment outlined the preferred remedial measure proposed for the remediation of the contaminated soil at the 93 Main Street site. The preferred remedy is excavation of the pesticide contaminated soils and institutional controls.

The release of the Proposed Record of Decision Amendment was announced via a notice to the mailing list, informing the public of the document's availability.

A public meeting was held on May 2, 2007 which included a presentation of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site.

The public comment period for the Proposed Record of Decision Amendment ended on May 19, 2007.

This Responsiveness Summary responds to all questions and comments raised at the May 2, 2007 public meeting. There were no written comments received.

The following are the comments received at the public meeting, with the NYSDEC's and NYSDOH's responses:

**COMMENT 1:** How does this site compare to the Endicott site?

**RESPONSE 1:** The 93 Main Street site is significantly less complicated than "the Endicott site." The Endicott site is a much larger site that has impacted a much larger area with higher concentrations of VOCs than the 93 Main St. site has project is studying the effects of a groundwater plume of chlorinated volatile organic compounds covering approximately 500 acres. The 93 Main St. Street site is a much smaller and less complicated project than Endicott involves primarily pesticide contamination in the soil, which is relatively non-mobile in the soil vapor phase. Investigation of soil vapor in the area for chlorinated volatile organic compounds was performed as a precautionary measure in response to the low levels of these compounds found on site.

**COMMENT 2:** Could the contamination at the site get worse and is it leaving the site?

**RESPONSE 2:** No, the contamination will not increase. The highest levels of the contamination are in the soil on site. A groundwater plume has migrated off site according to groundwater samples collected during the 1998 and 1999 sampling events. However, the Pre-Design groundwater samples collected

during 2005 show that the contaminants in the groundwater are naturally attenuating and the concentrations of the contamination have decreased to levels below New York State Groundwater Standards at the edge of the plume. The groundwater contamination at this time is localized to the site.

**COMMENT 3:** What can be built on the property with a “restricted-residential use” easement?

**RESPONSE 3:** "Restricted-residential use" prohibits single family housing and any vegetable gardens, although community vegetable gardens may be considered with Department approval. Any other construction and re-use is permitted, including active recreational uses, which are public uses with a reasonable potential for soil contact.

**COMMENT 4:** If the City of Binghamton takes title to the land would it have to pay for the remedial work performed under the Superfund Program?

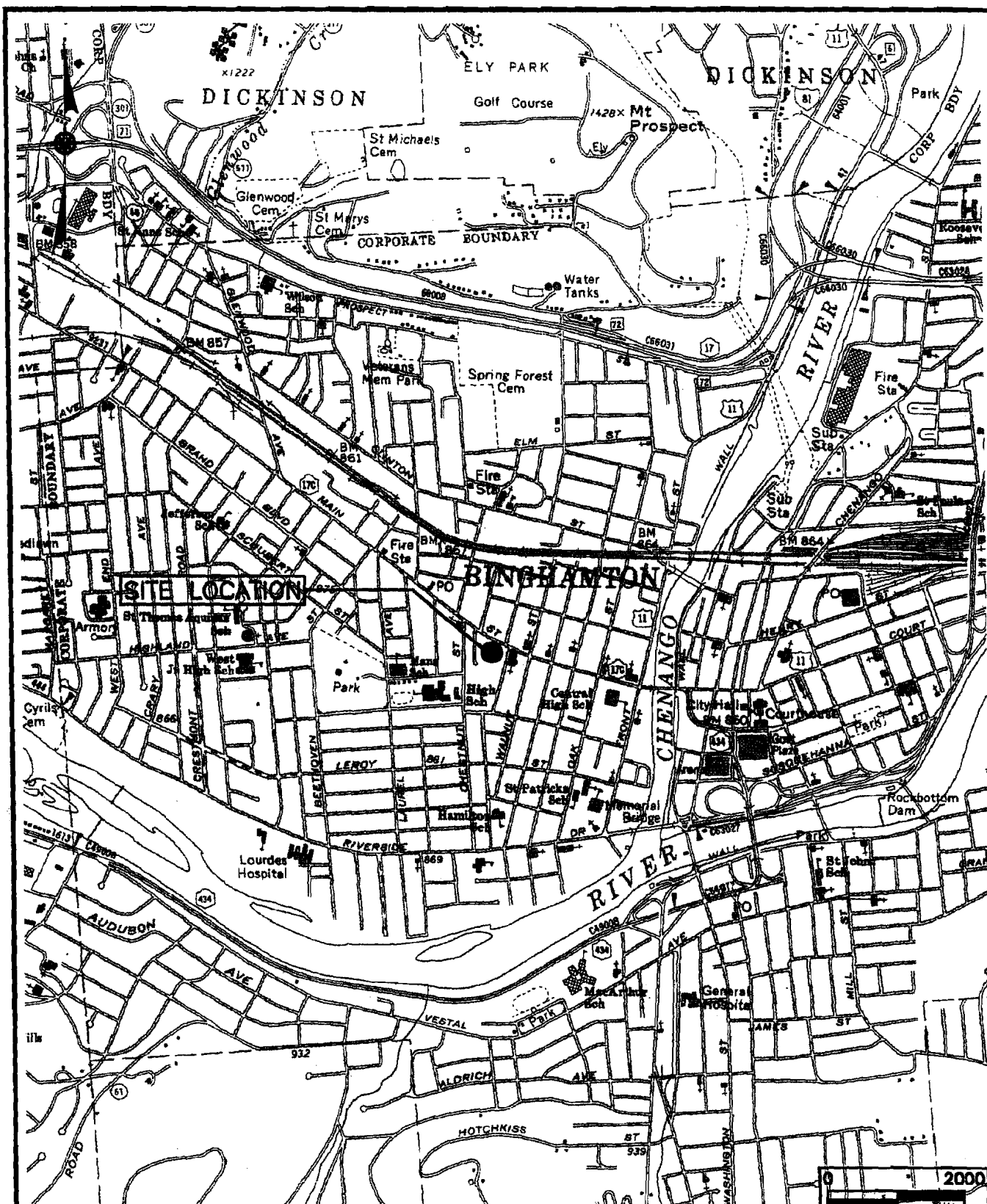
**RESPONSE 4:** At this time the City of Binghamton is not the title holder or a potential responsible party (PRP) under the law and therefore, not required to pay for past costs. Eventually if no PRP pays for past costs associated with the site, a lien will most likely be placed on the real property. With regard to Institutional Controls, should the city take title to the property it will be subject to any environmental easements.

**COMMENT 5:** What can the members of the City of Binghamton Council do to help the project along?

**RESPONSE 5:** Actively participating, like you are doing here tonight, will help the project.

**COMMENT 6:** What will happen next? When will the remedy be implemented?

**RESPONSE 6:** After the Amended Record of Decision is finalized, the project can proceed through remedial design, and a construction contract can be developed, put out for bid, and awarded. At this time, it is anticipated that the bid will be awarded and the remedy will be implemented in the Spring of 2008.



SOURCE: UNITED STATES GEOLOGICAL SURVEY BINGHAMTON WEST QUADRANGLE

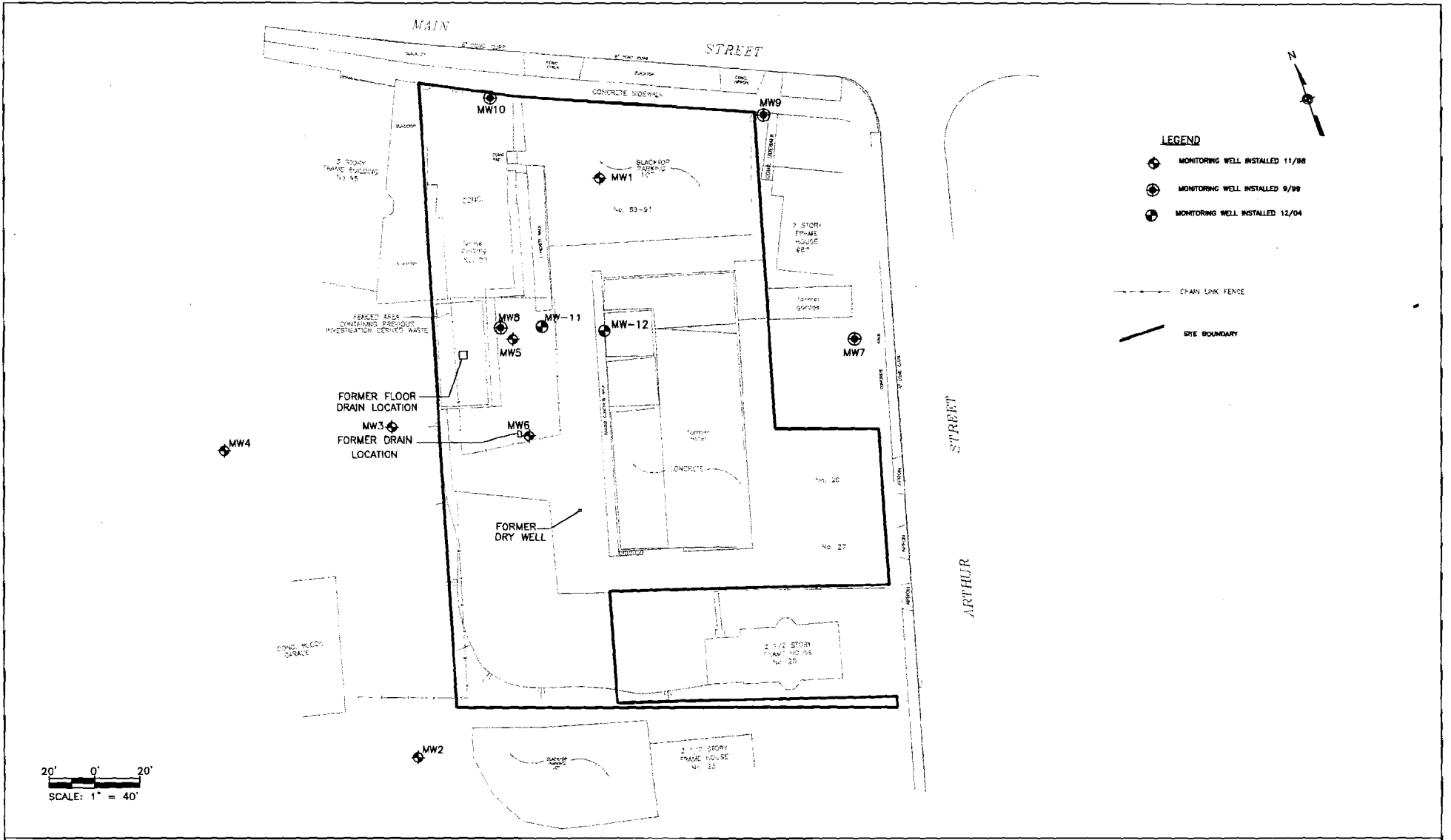
93 MAIN STREET SITE REMEDIAL DESIGN  
BINGHAMTON, NEW YORK

SITE LOCATION MAP

**db** Dvirka  
and  
Bartilucci  
CONSULTING ENGINEERS  
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

FIGURE 1

OCT 31, 2005 SEP C:\22\17\93 main map rd base.dwg



**db** Dvirka and Bortolucci  
Consulting Engineers  
A Division of William F. Cosulich Associates, P.C.

FIGURE 2

