



FACT SHEET

State Superfund Program

Morse Industrial Corporation
Operable Unit No. 3
Site Number: 755010
City of Ithaca, NY

June 2010

Remedy Proposed for State Superfund Site; Public Comment Period and Public Meeting Announced

The public is invited to comment on a remedy proposed by the New York State Department of Environmental Conservation (NYSDEC) to address contamination related to the Morse Industrial Corporation Site, Operable Unit (OU) No. 3 ("site"). The site is located in the City of Ithaca, Tompkins County. See map for site location.

The Proposed Remedy

The remedy proposed for the site includes removal and replacement of approximately 300 feet of sanitary sewer line along East Spencer Street beginning at its intersection with Turner Place, along with continued operation of the previously installed vapor mitigation systems to mitigate soil vapor intrusion into the indoor air of homes and other structures in the area.

The proposed remedy is described in a draft cleanup plan called a "Proposed Remedial Action Plan" (PRAP) developed under New York's State Superfund Program. The document is available for public review at the locations identified below under "Where to Find Information." The document also is available on the NYSDEC web site at <http://www.dec.ny.gov/chemical/8669.html> and at the Ithaca-South Hill Industrial Pollution (SHIP) web site at <http://ithaca-ship.org/>.

Public Meeting
Thursday June 17, 2010
7:30 pm

Ithaca Town Hall
215 North Tioga Street
Ithaca, New York

NYSDEC invites you to a public meeting to discuss the remedy proposed for the site. You are encouraged to provide comments at the meeting, and during the 30-day comment period described in this Fact Sheet.

State Superfund Program: New York's State Superfund Program (SSF) identifies and characterizes suspected inactive hazardous waste disposal sites. Sites that pose a significant threat to public health and the environment go through a process of investigation, evaluation, cleanup and monitoring.

NYSDEC generally attempts to identify parties responsible for site contamination and require cleanup before committing State funds.

For more information about the SSF, visit:
www.dec.ny.gov/chemical/8439.html

How to Comment

NYSDEC is accepting written comments about the proposed remedy for 30 days, from June 7 through July 9, 2010.

Submit written comments to:

Karen A. Cahill
New York State Dept. of Environmental Conservation
Region 7
615 Erie Boulevard West
Syracuse, NY 13204-2400

Summary of the Proposed Remedy

The proposed remedy represents the alternative supported by NYSDEC and the New York State Department of Health (NYSDOH) to address site contamination. The draft cleanup plan has several goals:

- identify cleanup levels to be achieved;
- summarize other alternatives considered;
- explain why NYSDEC and NYSDOH believe the proposed remedy is protective of public health and the environment; and
- provide a detailed description of the proposed remedy.

The proposed remedy was chosen following a detailed investigation of the site and evaluation of alternatives to address contamination, called a “Remedial Investigation/Feasibility Study.”

The primary elements of the proposed remedy include:

- Removal and replacement of approximately 300 feet of sanitary sewer line (and removal of associated overburden and bedding material, if present) along East Spencer Street beginning at its intersection with Turner Place;
- Installation of slotted or perforated pipe to passively vent soil vapor that re-enters the sewer trench and maintenance and monitoring of the system;
- Continued operation, maintenance, and monitoring of the previously installed vapor mitigation systems to mitigate the potential for soil vapor intrusion into the indoor air of homes and other structures in the area; and
- A provision for the evaluation of the potential for soil vapor intrusion into any buildings developed on the site, or for a significant change in use of existing buildings, or if a vacant building becomes occupied.

Under this proposed remedy, potential contact with site contamination would be reduced and/or eliminated by venting and mitigation of volatile organic compounds (VOCs) associated with soil vapor intrusion. The proposed remedy is protective of public health and the environment, provides reasonable long-term effectiveness, and allows compliance with environmental laws, regulations, and other standards and criteria to be monitored.

The estimated total cost to implement the remedy is \$1,143,200.

Next Steps

NYSDEC will consider public comments as it finalizes the remedy for the site. The selected remedy will be described in a document called a “Record of Decision” that will explain why the remedy was selected and respond to public comments. This document will be made available to the public (see “Where to Find Information” below).

Following release of the Record of Decision, the project will then move into the remedial design and remedial action phase. The NYSDEC will keep the public informed during this process.

Background

The Morse Industrial Corporation site occupies 100 acres along the west side of South Aurora Street/Danby Road (Route 96B) in the South Hill portion of the City of Ithaca, Tompkins County, New York (Figure 1). The plant consists of three main buildings flanked by a number of smaller buildings to the southwest and a series of access roads and parking lots that terrace the hillside above the plant to the east. The site is listed as a Class “2” site in the State Registry of Inactive Hazardous Waste Sites (list of State Superfund sites). A Class 2 site represents a significant threat to public health or the environment; action is required.

Operable Unit (OU) No. 3, which is the subject of the PRAP, consists of the neighborhoods, sewer lines and residential structures to the north and west of the plant site. The residential neighborhood is bordered by Six Mile Creek to the west, which flows north along the base of South Hill and eventually empties into Cayuga Lake approximately two miles northwest of the plant site.

The original plant building was constructed in 1906 by Morse Industrial Corporation, which manufactured steel roller chain for the automobile industry. Up until the late 1970s, Borg-Warner used trichloroethene (TCE), a common solvent at the time, for cleaning and degreasing metal parts. TCE and other solvents containing VOCs appear to have been flushed into the plant’s sanitary sewer system and are believed to have leaked out from the sewer system through cracks and joints in the sewer lines in the vicinity of the residential neighborhood to the north and west of the plant.

In 1983, Morse Industrial Corporation was purchased from Borg-Warner by Emerson Electric Company, and in the late 1980s the facility became known as Emerson Power Transmission (EPT). EPT currently manufactures industrial roller chain, bearings, and clutching for the power transmission industry. Under Emerson’s ownership, TCE has not been used at the facility.

An interim remedial measure (IRM) was conducted at the site which consisted of the installation of soil vapor mitigation systems at several structures to address both current and potential indoor air contamination of volatile organic compounds associated with soil vapor intrusion. Some of the mitigation systems were installed on a voluntary basis by EPT.

FOR MORE INFORMATION

Where to Find Information

Project documents are available at the following locations to help the public to stay informed. These documents include the PRAP.

NYS Dept. of Environmental Conservation
615 Erie Boulevard West
Syracuse, NY 13204-2400
Phone: (315) 426-7400
Attention: Kim Wentworth
Hours: Mon-Fri 8:30AM – 4:45PM

Tompkins County Public Library
101 East Green Street
Ithaca, NY 14850
Phone: (607) 272-4557
Hours: Mon-Thurs, 10AM – 8:15PM;
Fri-Sat 10AM – 5 PM; Sun 1PM – 5PM

Who to Contact

Comments and questions are always welcome and should be directed as follows:

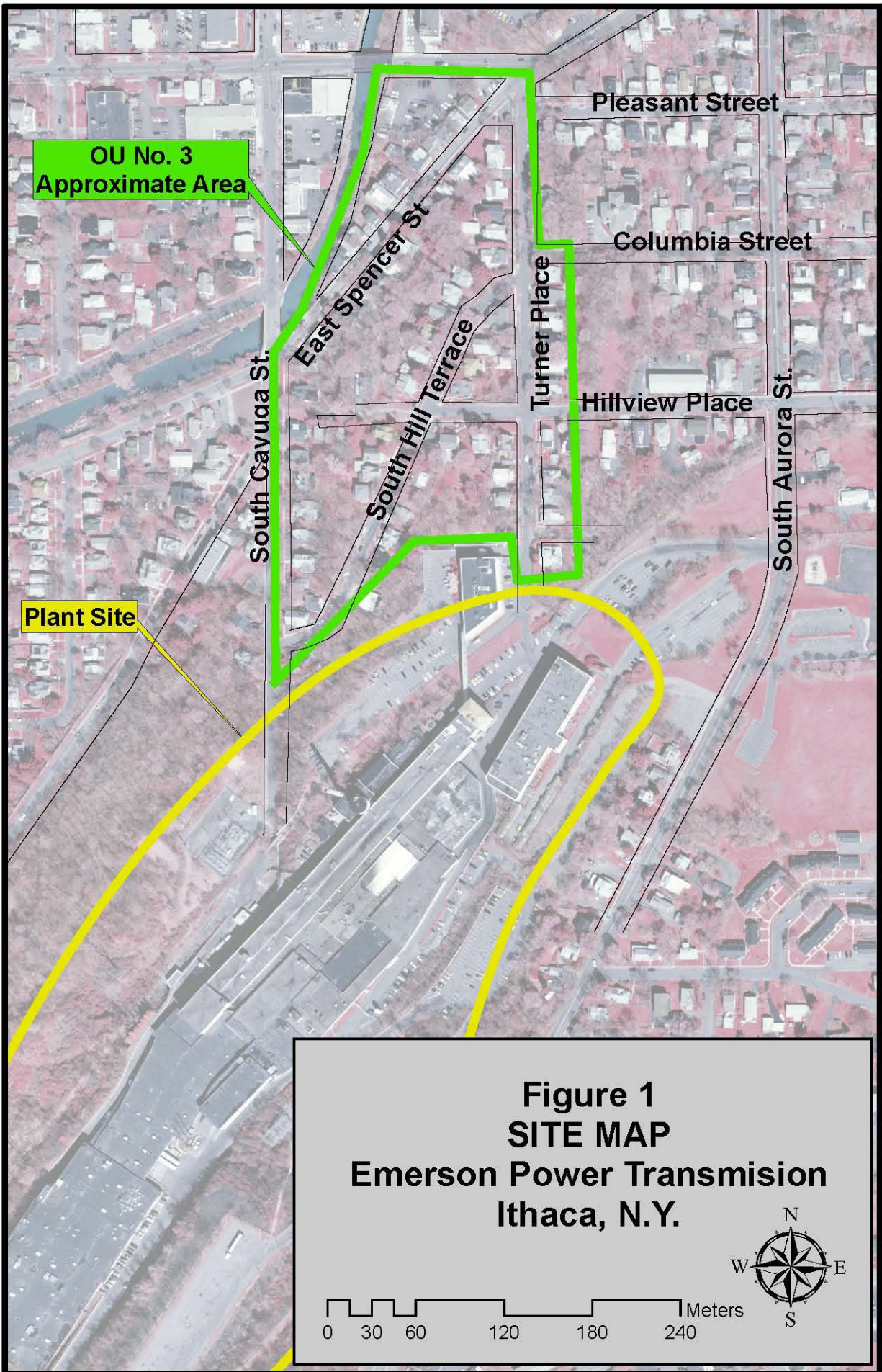
Project Related Questions

Karen A. Cahill
New York State Department of
Environmental Conservation
Region 7
615 Erie Boulevard West
Syracuse, New York 13204-2400
(315) 426-7432
kacahill@gw.dec.state.ny.us

Project Related Health Questions

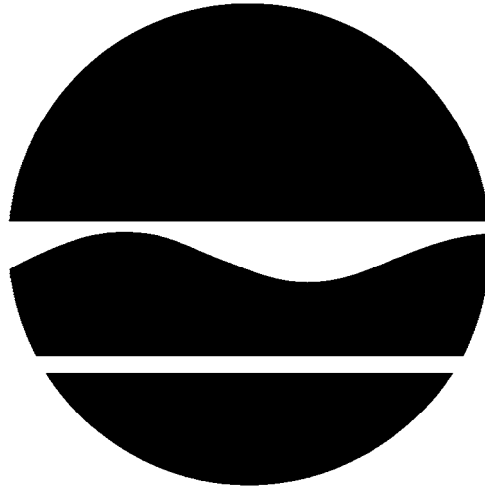
Susan B. Shearer
New York State Department of Health
Bureau of Environmental Exposure Investigation
547 River Street
Troy, New York 12180-2216
(800) 458-1158, Ext. 27860
bee@health.state.ny.us

If you know someone who would like to be added to the site contact list, have them contact the NYSDEC project manager above. We encourage you to share this Fact Sheet with neighbors and tenants, and/or post it in a prominent area of your building for others to see.



**PROPOSED REMEDIAL ACTION PLAN
MORSE INDUSTRIAL CORPORATION
Operable Unit No. 3
State Superfund Project**

**City of Ithaca, Tompkins County, New York
Site No. 755010
June 2010**



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

PROPOSED REMEDIAL ACTION PLAN

MORSE INDUSTRIAL CORPORATION Operable Unit No. 3 State Superfund Project

City of Ithaca, Tompkins County, New York
Site No. 755010
June 2010

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous waste at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Sections 5 of this document, have contaminated various environmental media. The proposed remedy, discussed in detail in Section 8, is intended to attain the remedial action objectives identified for this site in Section 6 for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy. The Department will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this PRAP in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, 6 NYCRR Part 375. This document is a summary of the information that can be found in the site related reports and documents which are available for review at the document repositories. The public is encouraged to review the reports and documents, which are available at the following repositories:

NYS Dept. of Environmental Conservation
615 Erie Boulevard West
Syracuse, NY 13204-2400
Phone: (315) 426-7400
Attention: Kim Wentworth
Hours: Mon-Fri 8:30 AM – 4:45 PM

Tompkins County Public Library
101 East Green Street
Ithaca, NY 14850
Phone: (607) 272-4557
Hours: Mon-Thurs 10 AM – 8:15 PM;
Fri-Sat 10 AM – 5 PM; Sun 1 PM – 5 PM

The Department seeks input from the community on all PRAPs. A public comment period has been set from June 7 to July 9, 2010 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for June 17, 2010 at the Ithaca Town Hall beginning at 7:30 PM.

At the meeting, the findings of the remedial investigation (RI) and the alternative analysis (AA) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Karen A. Cahill, Project Manager at the following address through July 9, 2010.

NYS Dept. of Environmental Conservation
Division of Environmental Remediation
615 Erie Boulevard West
Syracuse, NY 13204-2400
Phone: (315) 426-7432

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

SECTION 2: SITE DESCRIPTION AND HISTORY

2.1: Location and Description

The Morse Industrial Corporation site occupies 100 acres along the west side of South Aurora Street/Danby Road (Route 96B) in the South Hill portion of the City of Ithaca, Tompkins County, New York (Figure 1). The site's surface elevation ranges from 450 to 720 feet above mean sea level, resulting in a very hilly topography. The site consists of three main buildings flanked by a number of smaller buildings to the southwest and a series of access roads and parking lots that terrace the hillside above the plant to the east. Undeveloped woodland borders the site to the southwest along the steep embankments of South Hill.

Operable Unit (OU) No. 3, which is the subject of this document, consists of the neighborhoods, sewer lines and residential structures to the north and west of the plant site (Figures 1 and 2). An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. The remaining operable units for this site are located at the plant and are being addressed through a December 1994 ROD and a June 2009 ROD amendment.

North of the plant, the topography drops off at a 40% grade (approximately 80 feet) to a residential area. The residential structures are generally terraced into the steep hillside. Some basement floors are directly on bedrock while others are built on a combination of bedrock and cut-and-fill material. These homes are serviced by municipal subsurface utilities including water, sewer and natural gas.

Bedrock in the area is weathered into the upper eight to twelve feet and has a series of regular vertical joint sets identified both in outcrop and through geophysical techniques. The residential neighborhood is bordered by Six Mile Creek to the west, which flows north along the base of South Hill and eventually empties into Cayuga Lake approximately two miles northwest of the site.

2.2: Operational/Disposal History

The original plant building was constructed in 1906 by Morse Industrial Corporation, which manufactured steel roller chain for the automobile industry. From approximately 1928 to 1983, Borg-Warner Corporation owned the property and manufactured automotive components and power transmission equipment. Up until the late 1970s, Borg-Warner used trichloroethene (TCE), a common solvent at the time, for cleaning and degreasing metal parts. An estimated sixty metal piercing and blanking machines were in operation from the early 1950s to 1977. These machines reportedly operated without drip pans in the 1950s, and solvents used to clean the residual oil from the floors appear to have been flushed into the plant's sanitary sewer system and are believed to have leaked out from the sewer system through cracks and joints in the sewer lines in the vicinity of the residential neighborhood to the north and west of the plant.

In 1983, Morse Industrial Corporation was purchased from Borg-Warner by Emerson Electric Company, and in the late 1980s the facility became known as Emerson Power Transmission (EPT). EPT currently manufactures industrial roller chain, bearings, and clutching for the power transmission industry. Under Emerson's ownership, TCE has not been used at the facility.

2.3: Remedial History

1. Remedial Parties and Program.

The remedial program is being performed by EPT as a Responsible Party in the Department's State Superfund Program. As a result of identified hazardous waste disposal, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York in July 1987. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

2. Investigation/Actions.

- Indoor air sampling of private residences by NYSDOH completed in May 1991
- Vadose zone monitoring completed in June 2004
- Initial soil vapor intrusion assessments of private residences and public structures (Phases I through V, Figure 4) completed in March 2007
- Soil vapor and manhole vapor sampling along sewer lines completed in August 2007
- Installation of mitigation systems on private residences was initiated in 2005
- Vent stack sampling completed in July 2008
- Sewer manhole assessment completed in July 2008
- Focused ambient air sampling completed in July 2008
- Supplemental investigation of sanitary sewers completed in July 2008

SECTION 3: LAND USE

The Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings when assessing the nature and extent of contamination. Neither soil nor groundwater data suggest the need for any land use restrictions in OU No. 3.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The Department and EPT entered into a Consent Order on July 13, 1988. The Order obligates the responsible party to implement a full remedial program.

SECTION 5: SITE CONTAMINATION

A remedial investigation has been conducted to determine the nature and extent of contamination and to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the remedial investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site. Remedial investigation activities for OU No. 3 were conducted between May 1991 and July 2008 as outlined in Section 2.3, and the remedial investigation is considered complete. The field activities and findings are described in the April 4, 2008 Supplemental Remedial Investigation Report and the September 3, 2009 Alternatives Analysis Report.

The following remedial investigation activities were conducted:

- Research of historical information,
- Geophysical survey to determine the lateral extent of subsurface conductive features,
- Soil borings and monitoring well installations,
- Sampling of subsurface soils, groundwater, soil vapor and indoor air,
- Human Health Exposure Assessments.

5.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and surface and subsurface soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see:

<http://www.dec.ny.gov/regulations/61794.html>

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the reports referenced in Section 5.1.

5.1.2: Nature and Extent of Contamination

As discussed in Section 2.2, spent solvents containing volatile organic compounds (VOCs) from plant operations were historically discharged into the municipal sewer system. The sewer lines servicing the plant run in a northwesterly direction through the South Hill neighborhood along Turner Place and South Cayuga Street. According to City of Ithaca utility drawings, the majority of the sanitary sewer lines along both Turner Place and South Cayuga Street are trenched directly into unsaturated, highly fractured bedrock. Releases from these sewers can be conceptualized as leaks through cracks and joints of an aging system that migrated along the surrounding bedding material, where present, or directly into the fractured bedrock. Subsequently, VOC-contaminated wastewater which seeped into the fractured bedrock continued to migrate into the deeper sediment-filled fractures (joints and bedding planes) in the bedrock or was held by capillary forces within the pore spaces. VOCs subsequently volatilize into the gaseous phase and are transported by diffusion both laterally and vertically (based on a pressure differential) through the fractures and along the sewers and laterals, eventually reaching the basements of certain homes within the South Hill neighborhood (Figure 3). This conceptual site model is supported by the results of the soil vapor and soil vapor intrusion sampling that has been conducted throughout the area. The highest concentrations of TCE and other VOCs have consistently been detected in samples collected directly over the sewer lines, while contaminant concentrations dropped off appreciably in samples collected as few as ten feet off the sewer lines.

Where present, soils in the immediate vicinity of the sewer lines within OU No. 3 were evaluated for potential impacts from historical releases. A total of 25 soil samples were collected from the soil/bedrock interface approximately three to six feet below grade as part of the RI work. TCE was detected in 16 of the samples, but at concentrations that were below the NYSDEC's Soil Cleanup Objective (SCO) for unrestricted use. In most instances, the concentrations were several orders of magnitude below the SCO.

Groundwater resources at the site include a shallow fractured bedrock horizon and a deeper, competent bedrock in which groundwater resides in a vertical fracture network. Six monitoring wells were installed within OU No. 3 in both the shallow and the deeper bedrock horizons to evaluate possible groundwater impacts. TCE concentrations in groundwater were either non-detect, or were below ambient water quality standards in all sample locations.

Soil Vapor Intrusion

The evaluation of the potential for soil vapor was conducted by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air inside structures. At this site, due to the presence of buildings in the impacted area, a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

The initial sampling was conducted in five phases between the fall of 2004 and the fall/winter of 2006/2007 and involved approximately 100 structures (Figure 4). The results indicated that soil vapors were impacting the indoor air of several structures. Based on the concentrations of TCE and other VOCs detected in sub-slab soil vapor and indoor air in comparison to the NYSDOH Soil Vapor Intrusion Guidance and EPT's voluntary mitigation offers, soil vapor contamination identified during the RI was addressed during the IRM described in Section 5.2.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

Mitigation measures were taken at several structures to address both current and potential indoor air contamination of VOCs associated with soil vapor intrusion. As of mid-May 2010, 50 sub-slab depressurization systems (i.e., vapor mitigation systems) had been installed by EPT and another nine were pending. There were also outstanding offers from EPT for the installation of seven additional systems.

It is important to note that a comparison of indoor air and sub-slab soil vapor data to the NYSDOH Soil Vapor Intrusion Guidance resulted in the installation of only nine mitigation systems. All of the remaining systems (and offers) were voluntary on the part of EPT based upon the detection of TCE in indoor air.

5.3: Summary of Human Exposure Pathways:

This section describes the current or potential human exposures (the way people may come in contact with contamination) that may result from the site contamination. A more detailed discussion of the human exposure pathways can be found in the reports available at the document repository. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

As discussed in Section 5.2 above, vapor mitigation systems have already been provided to the nine homes within OU No. 3 where, based upon a comparison of indoor air and sub-slab soil vapor data, the NYSDOH Soil Vapor Intrusion Guidance recommended mitigation. Continued operation of the vapor mitigation systems reduces the potential for exposure from soil vapor intrusion into the homes.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site.

The environmental medium of concern within OU No. 3 is soil vapor, in particular the ability of VOC-contaminated soil vapor to migrate to homes and other structures in the area and adversely impact indoor air.

As discussed in Section 5.1.2, no site-related soil or groundwater contamination was identified during RI activities. Therefore, no remedial alternatives need to be evaluated for soil or groundwater.

Further, given the site's residential setting, there are no ecological resources of concern present.

SECTION 6: SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objective for this site is:

Public Health Protection

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into the indoor air of buildings near a site.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Site were identified, screened and evaluated in the alternative analysis report which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site is presented below. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis.

As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following alternatives were considered to address the contaminated media identified at the site as describe in Section 5:

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM described in Section 5.2. This alternative leaves the site in its present condition and does not provide any additional protection of public health. The No Further Action Alternative serves as a baseline for comparison of the overall effectiveness of the other remedial alternatives. There are no costs associated with this alternative.

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM described in Section 5.2 and Site Management and Engineering Controls and Institutional Control as necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of a Site Management Plan, necessary to protect public health and the environment from contamination remaining at the site after the IRM.

Present Worth: \$536,100
Annual Costs: \$43,200

Alternative 3: East Spencer Street Sewer Line Focused Excavation and Venting

Alternative 3 involves the removal and replacement of approximately 300 feet of sanitary sewer line (and removal of associated overburden and bedding material, if present) along East Spencer Street beginning at its intersection with Turner Place (Figure 5). This designated length of sewer line is where the highest concentrations of TCE were detected in soil vapor samples collected within the South Hill neighborhood. This is also the area where the highest concentrations of TCE were detected in sub-slab soil vapor samples and, not coincidentally, where five of the nine homes requiring mitigation are located. Two prominent bedrock fractures are present directly below these homes (as well as three others on South Hill Terrace that also required mitigation), and it is believed that the fractures represent a primary migration pathway for contaminated soil vapor from the East Spencer Street sewer line to the homes.

Any overburden or bedding material that is excavated would be tested and properly disposed. The replacement line would be constructed using air- and water-tight joints to prevent the intrusion of soil vapor into the line from the surrounding formation. The pipe bedding would be composed of a highly permeable material to promote the venting of soil vapor. This would be enhanced by the installation of a slotted or perforated pipe within the bedding material. Soil vapor that re-enters the pipe trench would be vented to the atmosphere via a single or series of standpipes connected to the perforated pipe. The standpipe(s) would be fitted with a wind turbine or a barometric pressure-actuated device. As is the case with the residential systems, vented vapors are not anticipated to have any measurable impact to ambient air.

This alternative would be implemented in combination with the continued operation of the previously installed vapor mitigation systems to achieve the Remedial Action Objective (RAO) of mitigating soil vapor intrusion into the indoor air of homes and other structures in the area.

An institutional control, in the form of a Site Management Plan, would be necessary to insure proper operation and maintenance of the venting system and the vapor mitigation systems.

Present Worth: \$1,143,200
Capital Cost: \$596,000
Annual Costs: \$44,100

Alternative 4: Soil Vapor Extraction on Sewer Lines

Alternative 4 involves the installation of a soil vapor extraction (SVE) system on the sanitary sewer lines in the area of concern (Figures 1 and 2) with the goal of removing any accumulated vapors located within the bedding material surrounding the lines. This alternative may also include the installation of a vacuum on the inside of the lines. The vapors removed by the extraction system would be treated using conventional treatment methods (e.g., vapor-phase activated carbon).

This alternative would be implemented in combination with the continued operation of the previously installed vapor mitigation systems to achieve the Remedial Action Objective (RAO) of mitigating soil vapor intrusion into the indoor air of homes and other structures in the area.

An institutional control, in the form of a Site Management Plan, would be necessary to insure proper operation and maintenance of the SVE system and the vapor mitigation systems.

Present Worth: \$4,147,000
Capital Cost: \$2,214,000
Annual Costs: \$155,700

Alternative 5: Blanket Mitigation

Alternative 5 involves the installation of additional vapor mitigation systems at all homes and other structures across the area of concern (Figures 1 and 2) without additional pre-mitigation air sampling.

This alternative would be implemented in combination with the continued operation of the previously installed vapor mitigation systems to achieve the Remedial Action Objective (RAO) of mitigating soil vapor intrusion into the indoor air of homes and other structures in the area.

An institutional control, in the form of a Site Management Plan, would be necessary to insure proper operation and maintenance of the vapor mitigation systems.

Present Worth: \$2,999,650
Capital Cost: \$1,827,000
Annual Costs: \$94,500

7.2: Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which sets forth the requirements for the remediation of inactive hazardous waste disposal sites in New York. A detailed discussion of the evaluation criteria and comparative analysis is included in the Alternatives Analysis Report.

The first two evaluation criteria are termed “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.

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 next six “primary balancing criteria” are used to compare the positive and negative aspects of each of the remedial strategies.

3. 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.

4. 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.

5. Short-term Impacts and 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. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

6. Implementability. The technical 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.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in the Remedial Alternatives Cost Table 1.

Table 1
Remedial Alternative Costs

| Remedial Alternative | Capital Cost (\$) | Annual Costs (\$) | Total Present Worth (\$) |
|-----------------------------|--------------------------|--------------------------|---------------------------------|
| Alternative 1 (No Action) | 0 | 0 | 0 |
| Alternative 2 | 0 | 43,200 | 536,100 |
| Alternative 3 | 596,000 | 44,100 | 1,143,200 |
| Alternative 4 | 2,214,000 | 155,700 | 4,147,000 |
| Alternative 5 | 1,827,000 | 94,500 | 2,999,650 |

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, is considered a “modifying criterion” and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3 as the remedy for this site. The elements of the remedy are described at the end of this section.

8.1: Basis for Selection

The proposed remedy is based on the results of the RI, the evaluation of alternatives presented in Section 8 of the Alternatives Analysis Report, and the Responsible Party’s recommended remedial alternative.

Alternative 3 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the balancing criterion described in Section 7.2. It would achieve the remediation goals for the site by preventing the intrusion of contaminated soil vapor into homes through the continued operation of the existing vapor mitigation systems. Although the NYSDEC and the NYSDOH believe that such action is sufficient to mitigate potential exposure, the Responsible Party has proposed additional measures for the collection and venting of contaminated soil vapor closer to a suspected source area that otherwise would likely continue to migrate to, and accumulate beneath homes.

Alternative 1 (No Action) does not provide any protection to public health and will not be evaluated further. Like Alternative 3, Alternatives 2, 4 and 5 include the continued operation of the existing vapor mitigation systems and therefore meet the threshold criteria. Thus, the remaining criteria are particularly important in selecting a final remedy for the site.

There are no short-term impacts associated with Alternative 2. Alternatives 3 and 4 involve disruptions to the local community typical of a road construction project (e.g., street closure, heavy equipment noise, dust). Alternative 5 involves disruptions to individual homeowners or tenants associated with the scheduling and installation of additional vapor mitigation systems. Each of the alternatives is effective in the short term since each includes the continued operation of the existing vapor mitigation systems (and venting or SVE system, as applicable).

Alternatives 2 through 5 are all effective in the long term since a Site Management Plan will be implemented to insure continued operation and maintenance of the existing vapor mitigation systems.

Each of the alternatives (2 through 5) reduces the volume of contaminated soil vapor present in the subsurface through the continued operation of the existing vapor mitigation systems. Alternative 3 also reduces the mobility of the soil vapor by collecting and venting the vapor before it can migrate to, and accumulate beneath homes. Alternative 4 has the potential to reduce the mobility of the soil vapor as well, although there are a number of technical concerns regarding successful implementation of a full-scale SVE system (e.g., short-circuiting of air flow through bedding material, surrounding utility corridors and poorly sealed road surfaces).

Alternative 2 has already been implemented, as has a portion of Alternatives 3 through 5 (i.e., the existing vapor mitigation systems). Replacement of the sewer line and installation of a venting system as part of Alternative 3 relies on conventional construction methods and is readily implementable, although coordination with the City of Ithaca is necessary. Alternative 4 would require pre-design work (i.e., confirmation of existing sewer line locations and depths) to insure proper implementation. SVE pilot tests would also need to be completed to assess the appropriateness of full-scale implementation, and additional soil vapor samples would be needed to eliminate data gaps that exist along portions of the suspected pathways. Alternative 4 would also require the installation of large vacuum blowers as part of the SVE system, and finding a suitable location for the equipment would be difficult. It is not feasible to place the equipment on the EPT facility due to the length of conveyance piping needed and the change in elevation, which would result in substantial frictional head loss within the piping. Locating the equipment within the neighborhood is also not feasible due to the significant noise associated with the blowers. Alternative 5 includes the installation of additional vapor mitigation systems. Forty-eight systems have already been installed throughout the neighborhood utilizing conventional construction methods, and the systems are well understood by the community. However, gaining access to a property may increase the time necessary to install a mitigation system. In addition, the construction process itself may be slowed because of access limitations and City of Ithaca involvement in the residential construction permitting process.

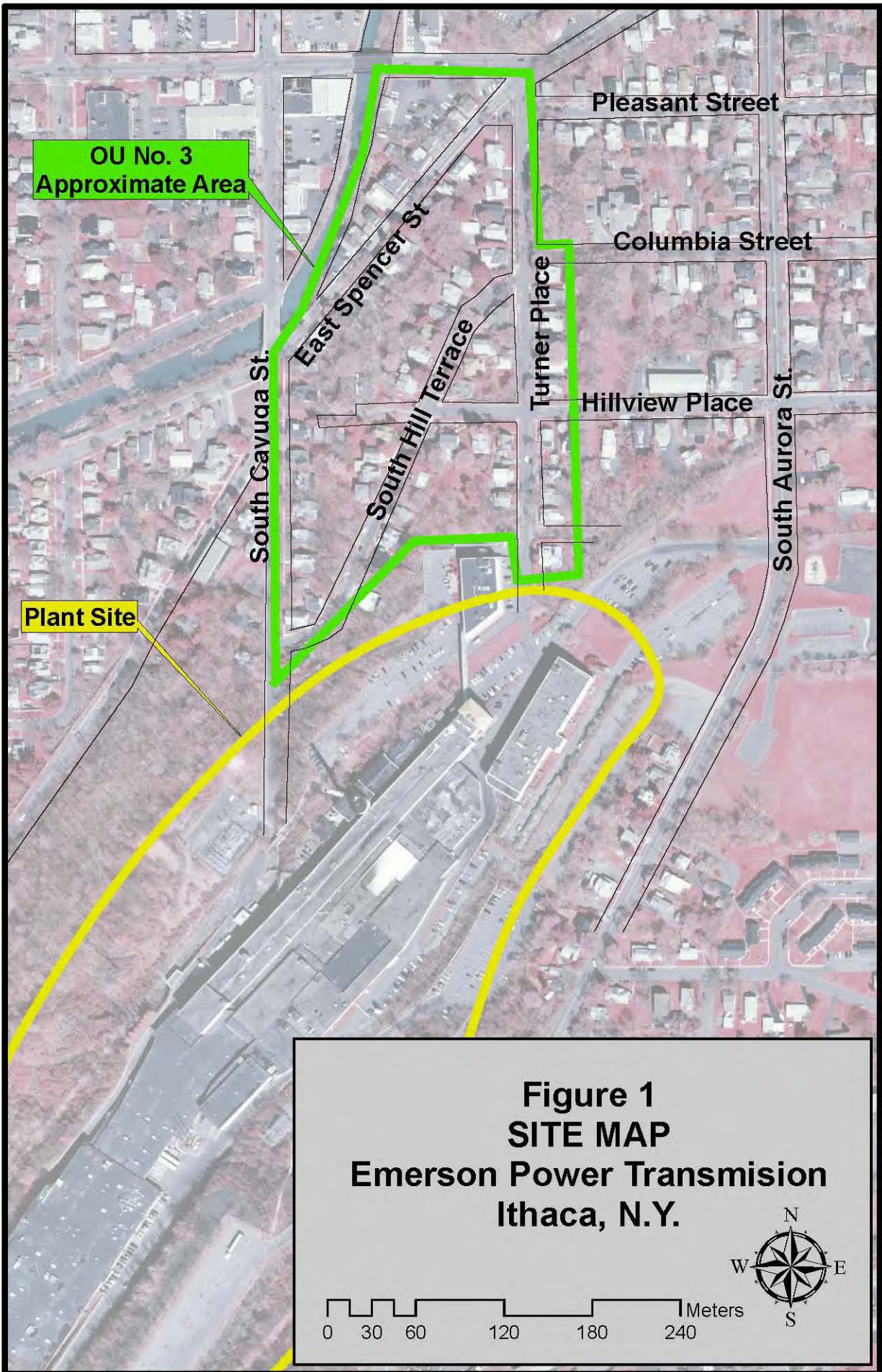
The costs of the alternatives vary significantly. Alternative 2 has the lowest overall cost, yet it includes no provisions to directly address the migration of contaminated soil vapor present in the subsurface. Alternative 3 has the next lowest cost, and it is the only alternative that provides a reliable means of directly addressing the migration of contaminated soil vapor. Alternative 4 is the most costly alternative, and the feasibility of successfully constructing and operating a full-scale SVE system is not likely. Alternative 5 is more costly than Alternative 3, and the need for the installation of additional vapor mitigation systems is not supported by the existing database in comparison to the NYSDOH Soil Vapor Intrusion Guidance. In addition, like Alternative 2, it does not include provisions to directly address the migration of contaminated soil vapor.

The estimated present worth cost to implement the remedy is \$1,143,200. The cost to construct the remedy is estimated to be \$596,000 and the estimated average annual costs for 30 years is \$44,100.

8.2: Elements of the Proposed Remedy

The elements of the proposed unrestricted use remedy are as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. The removal and replacement of approximately 300 feet of sanitary sewer line (and removal of associated overburden and bedding material, if present) along East Spencer Street beginning at its intersection with Turner Place (Figure 5). Any overburden or bedding material that is excavated would be tested and properly disposed. The replacement line would be constructed using air- and water-tight joints to prevent the intrusion of soil vapor into the line from the surrounding formation. The pipe bedding would be composed of a highly permeable material to promote the venting of soil vapor. This would be enhanced by the installation of a slotted or perforated pipe within the bedding material. Soil vapor that re-enters the trench would be vented to the atmosphere via a single or series of standpipes connected to the perforated pipe. The standpipe(s) would be fitted with a wind turbine or barometric pressure-actuated device.
3. Continued operation of the previously installed vapor mitigation systems to achieve the Remedial Action Objective (RAO) of mitigating soil vapor intrusion into the indoor air of homes and other structures in the area.
4. The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.
5. Since the remedy results in contamination remaining at the site, a Site Management Plan is required, which includes the following:
 - (a) an Engineering Control Plan that identifies all engineering controls for the site and details the steps and media-specific requirements necessary to assure the following engineering controls remain in place and are effective: the venting system discussed in Paragraph 2 above and the vapor mitigation systems discussed in Paragraph 3.
 - (b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but is not limited to:
 - (i) a schedule of monitoring and frequency of submittals to the Department;
 - (ii) a provision to evaluate the potential for vapor intrusion for any buildings developed on the site, including a provision for mitigation of any impacts identified;
 - (iii) a provision to evaluate the potential for soil vapor intrusion for existing buildings if building use changes significantly or if a vacant building become occupied.

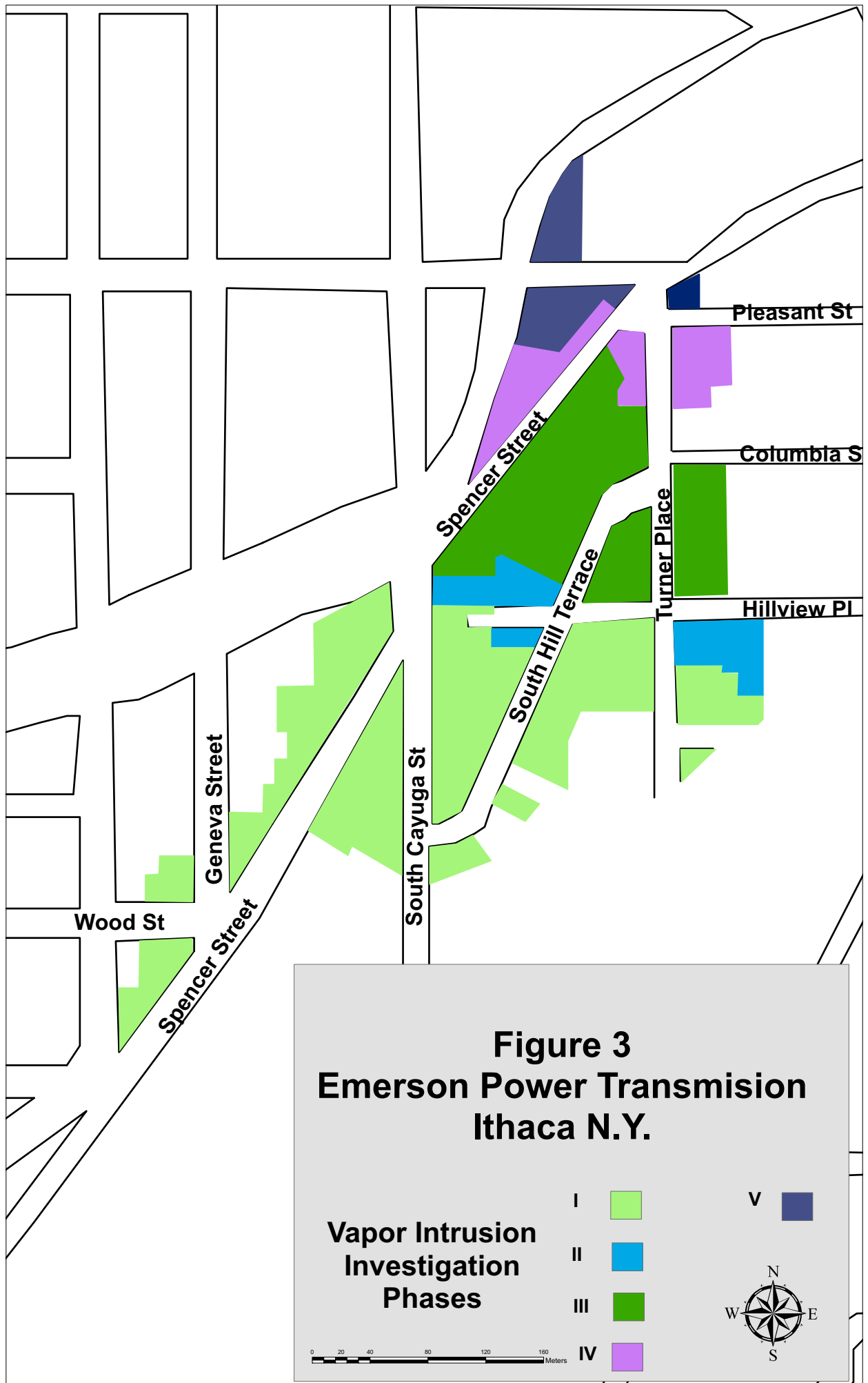






**OU No.3
Approximate Boundaries**

**Figure 2
OU No. 3
Emerson Power Transmission
Ithaca, N.Y.**





Legend

-  Conceptualized Historic Sewer Discharge
-  Vapor Migration Path

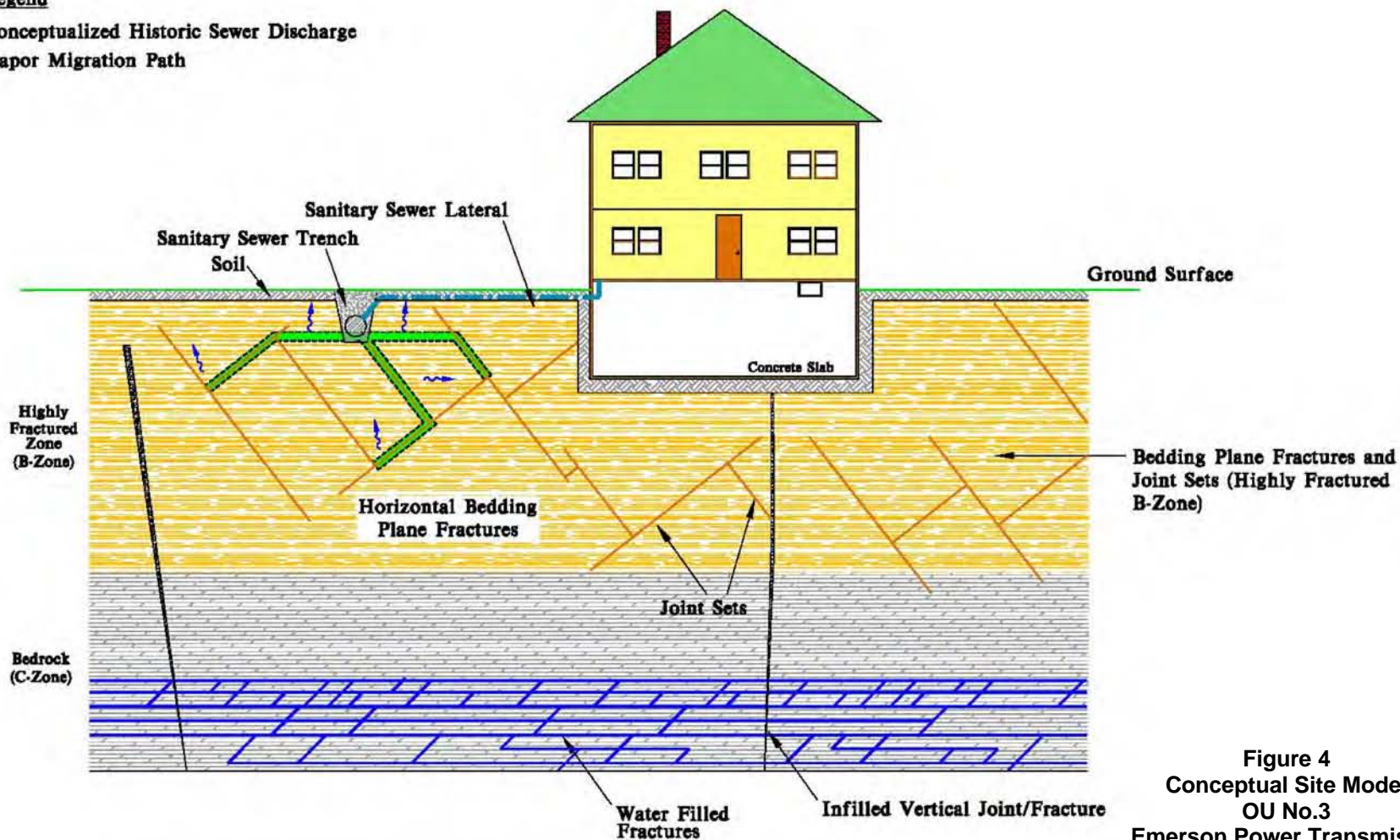
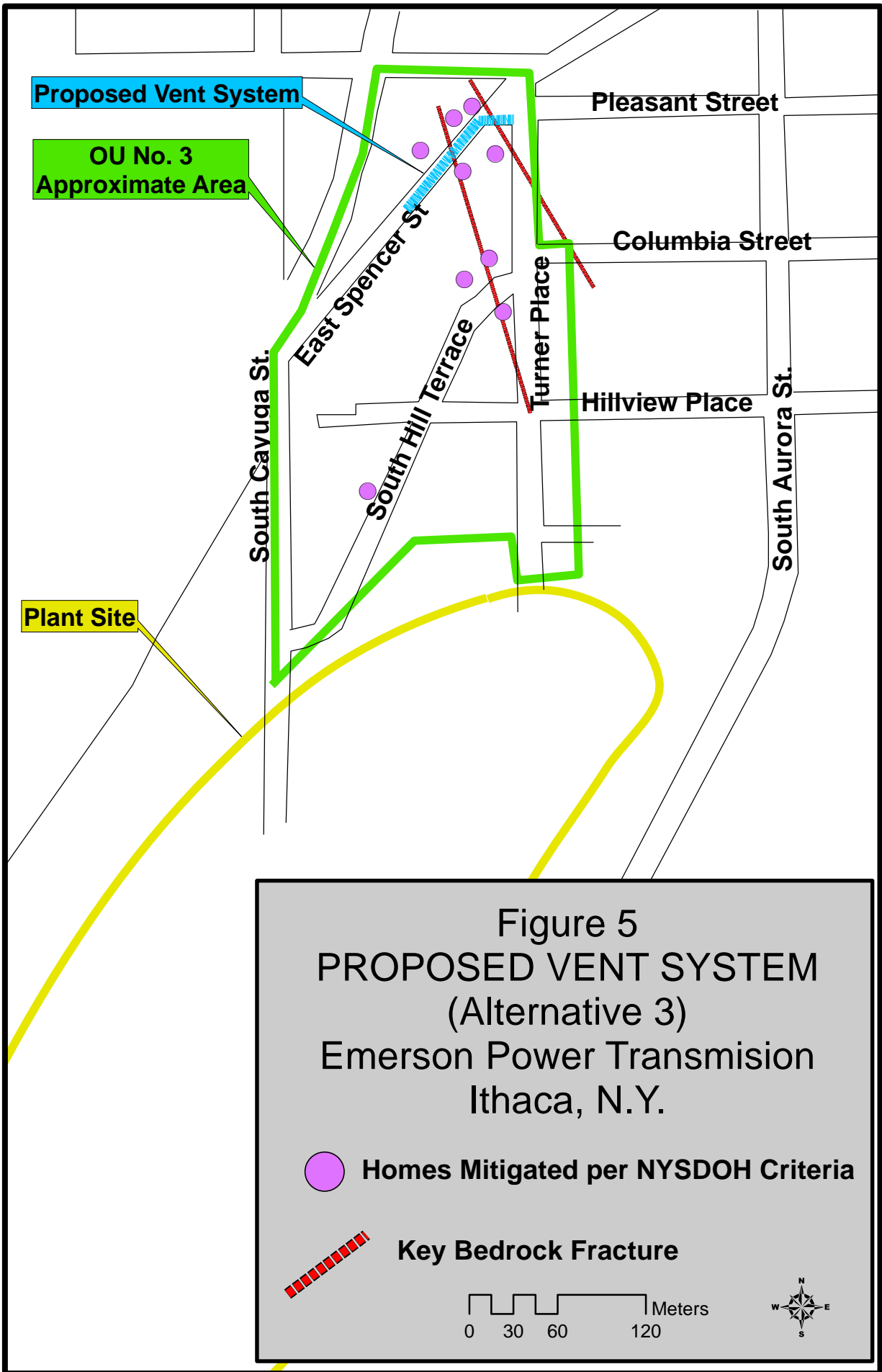


Figure 4
Conceptual Site Model
OU No.3
Emerson Power Transmission
Ithaca, N.Y.



Proposed Vent System

**OU No. 3
Approximate Area**

Plant Site

South Cayuga St.

East Spencer St

South Hill Terrace

Turner Place

Pleasant Street

Columbia Street

Hillview Place

South Aurora St.

**Figure 5
PROPOSED VENT SYSTEM
(Alternative 3)
Emerson Power Transmission
Ithaca, N.Y.**

Homes Mitigated per NYSDOH Criteria

Key Bedrock Fracture

0 30 60 120 Meters

