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Environmental Services and Solutions
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April 6, 2006

Michael Ryan
NYS Department of Environmental Conservation
625 Broadway, 11th Floor
Albany, NY 12233

Re: Supplemental Soil Sampling Assessment prepared for properties adjacent to the Perx Site, 7395 South Broadway, Village of Red Hook, Dutchess County, New York
ESI File: DR99140.45

Dear Mr. Ryan:

This Supplemental Soil Sampling Assessment has been prepared, at your request, for four properties (Properties) adjacent to the above referenced Perx site (Site).

The New York State Department of Environmental Conservation (NYSDEC) released the Environmental Restoration Record of Decision, Perx Property Site, Village of Red Hook, Dutchess County, New York, Site Number B-001773 (ROD) in February 2005. Activities designed to implement the remedial alternative chosen by NYSDEC were presented in the Remedial Design Report (RDR) prepared by Ecosystems Strategies, Inc. (ESI), dated September 2005. The RDR included provisions for supplemental soil sampling.

The purpose of this supplemental soil sampling was to define areas where soil remediation is warranted on Properties adjacent to the northern boundary of the Site. The objectives of this work were:

- To document the presence or absence of lead and arsenic in surface and subsurface soils within four properties adjacent to the Site; and,
- Based on these results, to propose, if warranted, soil removal activities in these areas.

A Site Location Map and a Fieldwork Map of Supplemental Soil Sampling are provided as Attachment A and summary data tables for lead and arsenic concentrations are provided as Attachment B. A Draft Scope of Work for removal of soils containing elevated arsenic is included as Attachment C.

Supplemental Soil Sampling

ESI conducted supplemental soil sampling at the Properties on February 2, February 23, March 6 and March 30, 2006.

Soil borings were extended to a maximum depth of two feet below surface grade (bsg) at thirty-seven (37) locations using a hand-held Geoprobe©. Replaceable acetate sleeves were used at each boring location to maintain quality control and minimize sample cross-contamination. The stainless steel outer sleeve and the cutting "shoe" were decontaminated using consecutive rinses of soapy water, nitric acid, methanol, and distilled water. Two samples were collected at each boring location: surface samples (0-4" bsg) and subsurface samples 20-24 inches (or the last four inches of recoverable soil).

Based on subsequent consultation with the NYSDEC and the NYSDOH, samples were collected at the 10 – 12 inch depth at eight locations to more accurately define the vertical extent of soils with elevated arsenic.

Results

Surface soil samples with documented metal concentrations above the ROD guidelines of 11.1 ppm of arsenic and 400 ppm of lead are noted below. Concentrations of lead and arsenic were below guidance levels in all subsurface soil samples. With one exception on the Haddad property, noted below, lead concentrations in surface samples were also below the guidance level.

Lot 220675 (Haddad) 38 Garden Street

Three borings were located on the Haddad property: 2OSC-1, 2OSC-2 and 3OSC-1. Surface samples were analyzed from all three locations and a subsurface sample (10-12") was analyzed from 2OSC-1. Surface soil at 2OSC-1 contained concentrations of lead (1,990 ppm) and arsenic (86.50 ppm), above guidance levels. Arsenic and lead concentrations in soils from the remaining two locations were below the guidance level.

Lot 211679 (Hart) 40 Garden Street

Fifteen borings were located on the Hart property: OSC-1 to OSC-7, 2OSC-3 to 2OSC-8, 3OSC-2 and 3OSC-3. Surface samples were analyzed from all locations. Subsurface samples from 10-12 inches were analyzed from 2OSC-7 and 3OSC-3. Subsurface samples from a depth of 20-24 inches were analyzed from OSC-1, OSC-3 and OSC-5. Soil from twelve surface locations contained concentrations of arsenic above guidance levels, ranging from 11.60 ppm (locations OSC-3 and 2OSC-7) to 22.30 ppm (location 2OSC-3). Arsenic concentrations in soils from the remaining three surface locations were below the guidance level.

Lot 202683 (Gorray) 44 Garden Street

Sixteen borings were located on the Gorray property: OSC-9, OSC-11, OSC-12, 2OSC-9 to 2OSC-14, 3OSC-4 to 3OSC-8, 3OSC-10 and 5OSC-1. Surface samples were analyzed from all locations. Subsurface samples 10-12 inches were analyzed from 2OSC-9 and 3OSC-5. A subsurface sample from 20-24 inches was analyzed from OSC-11. Soil from twelve surface locations contained concentrations of arsenic above guidance levels, ranging from 13.80 ppm (2OSC-14) to 57.30 ppm (2OSC-11). Arsenic concentrations in soils from the remaining three surface locations were below the guidance level.

Lot 194686 (Perfas) 46 Garden Street

Three borings were located on the Perfas property: 3OSC-9, 3OSC-11 and 5OSC-3. Surface samples were analyzed from all locations. A subsurface sample (10-12") was analyzed from 3OSC-11. Soil from 3OSC-11 contained concentrations of arsenic (121 ppm), above the guidance level. Arsenic concentrations in soils from the remaining two locations were below the guidance level.

Conclusions and Recommendations

The following conclusions are made based on the work performed by ESI:

1. Elevated concentrations of arsenic were found in 26 of 37 surface soil samples analyzed. The boundaries of surface soils containing elevated arsenic have been defined from these tests; therefore no further testing is warranted.

2. Soil samples collected at the 10 – 12 inch depth document the absence of elevated arsenic or lead in subsurface soils. Based on these data, ESI concludes that soil removal need extend only to the 12 inch depth.

3. Removal of soils containing elevated arsenic is warranted, based on the laboratory results. The total volume of impacted soil is estimated at 600 – 650 yd^3.

It is recommended that surface soils on these adjoining properties be excavated and removed (see Attachment C).

Please review this document and call me at (845) 452-1658 should you have any questions or comments.

Sincerely,

ECOSYSTEMS STRATEGIES, INC.

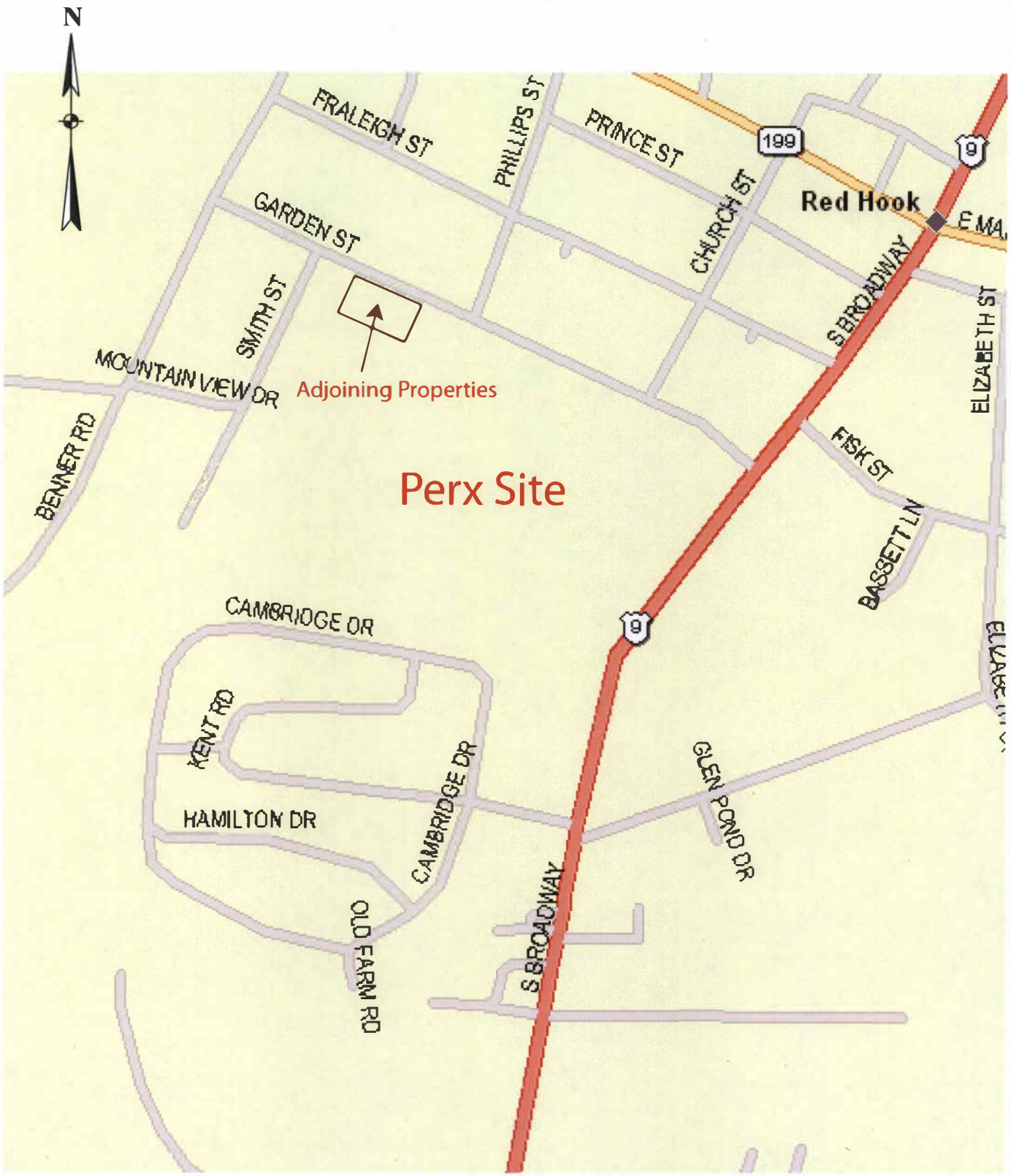
Paul H. Ciminello
President

Attachments: A – Maps
B – Summary Data Tables
C – Draft Scope of Work for Soil Removal

cc: M. Hubicki, NYSDEC Environmental Remediation
C. Obermeyer, NYSDOH
N. Hooper, Dutchess County, Dept of Planning and Development
N. Adams, Dewkett Engineering
File

ATTACHMENT A

Maps

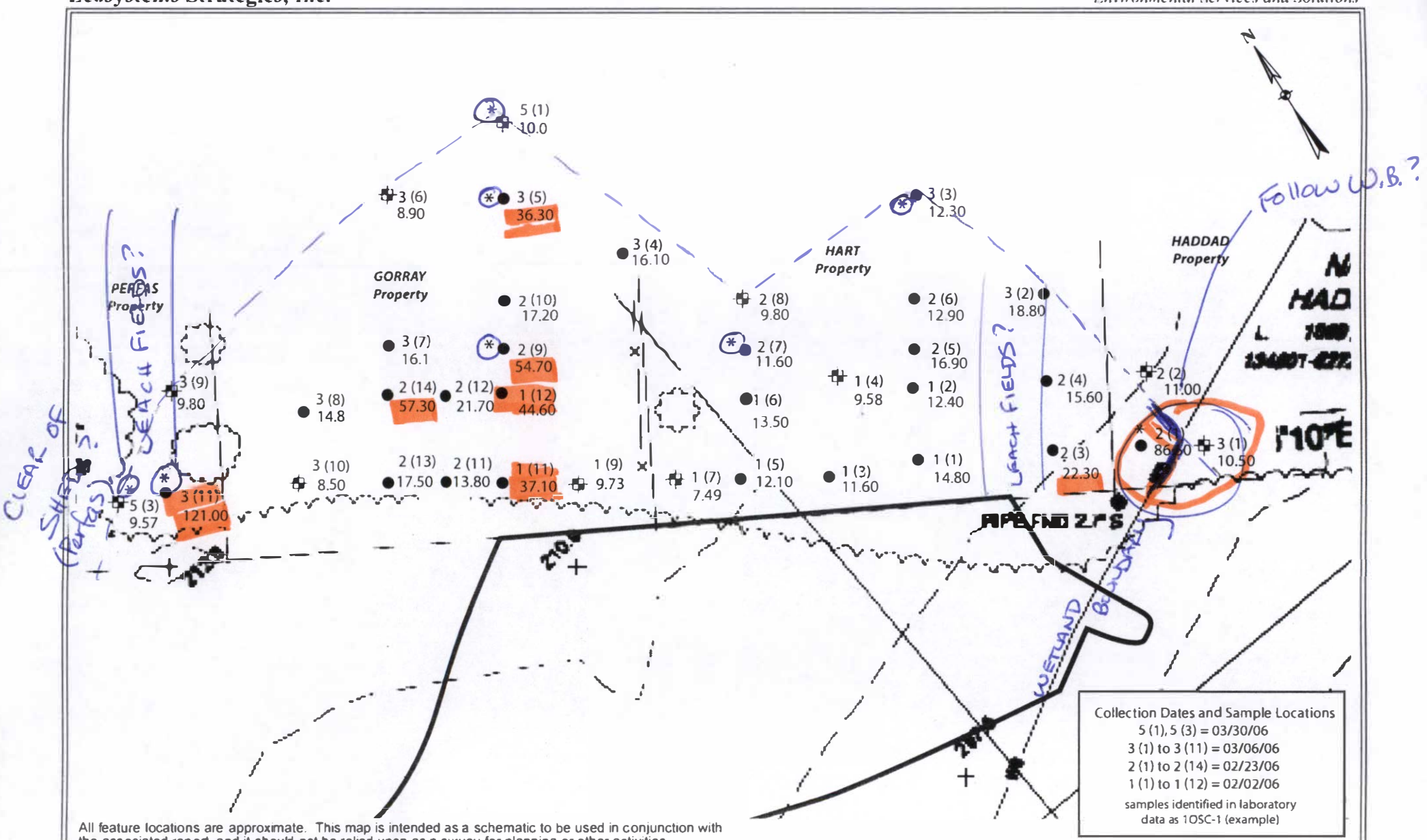


All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Site Location Map - Figure 1

Perx Property
7395 South Broadway
Village of Red Hook
Dutchess County, New York

ESI File: DR99140.45
April 2006
Attachment



All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

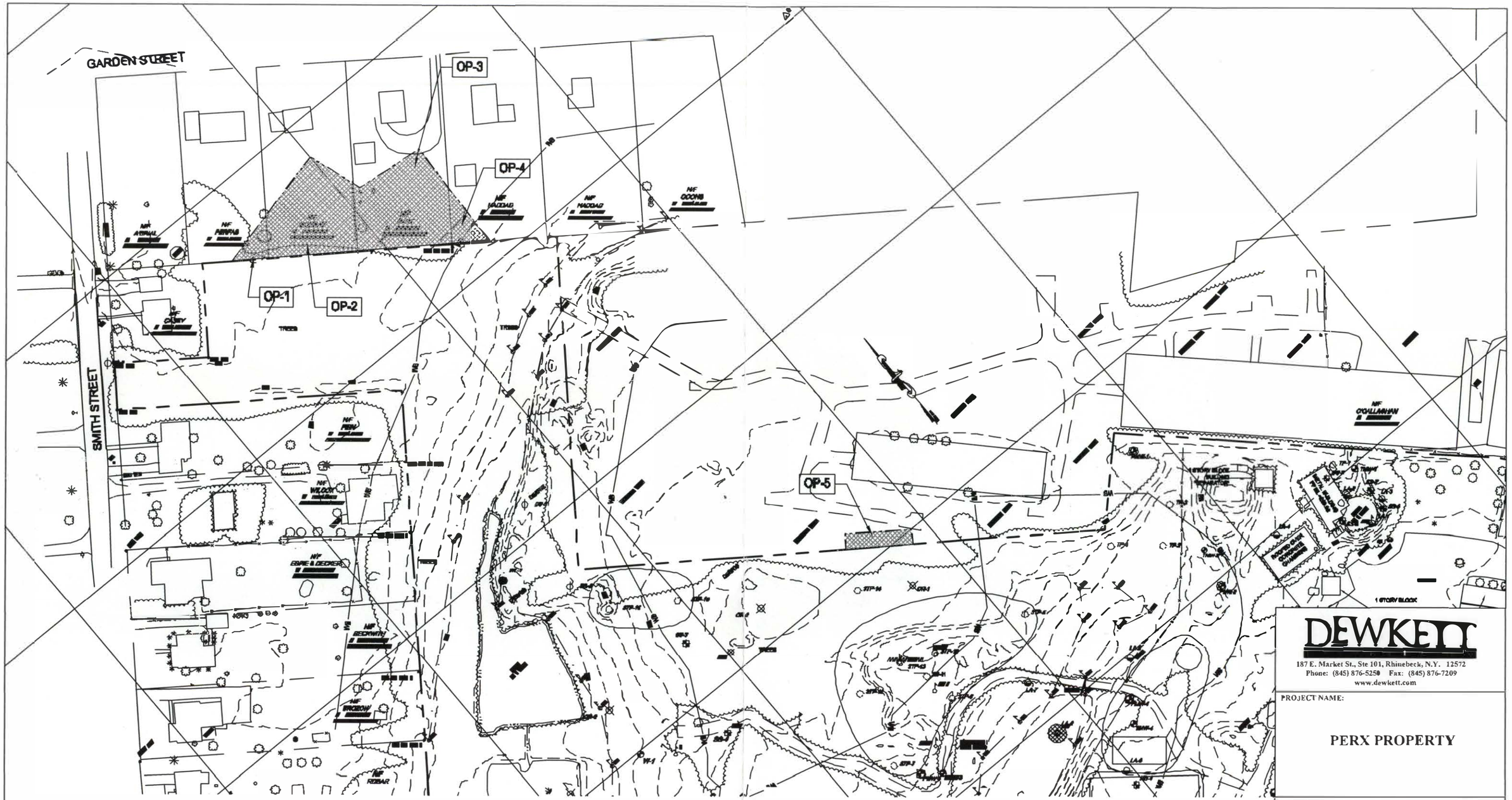
Fieldwork Map - Figure 2

Perx Property
7395 South Broadway
Village of Red Hook
Dutchess County, New York

Legend:
- portion of on-site excavation
- boundary of "Soil Removal Area"
- * samples collected at 10 - 12" depth
- sample location
- sample location with exceedences

2 (8) = sample ID
9.80 = Arsenic consentrations (ppm)

ESI File: DR99140.45
April 2006
Scale: 1" = 30' approximately
Attachment



DEWKETT
187 E. Market St., Ste 101, Rhinebeck, N.Y. 12572
Phone: (845) 876-5250 Fax: (845) 876-7209
www.dewkett.com

PROJECT NAME:

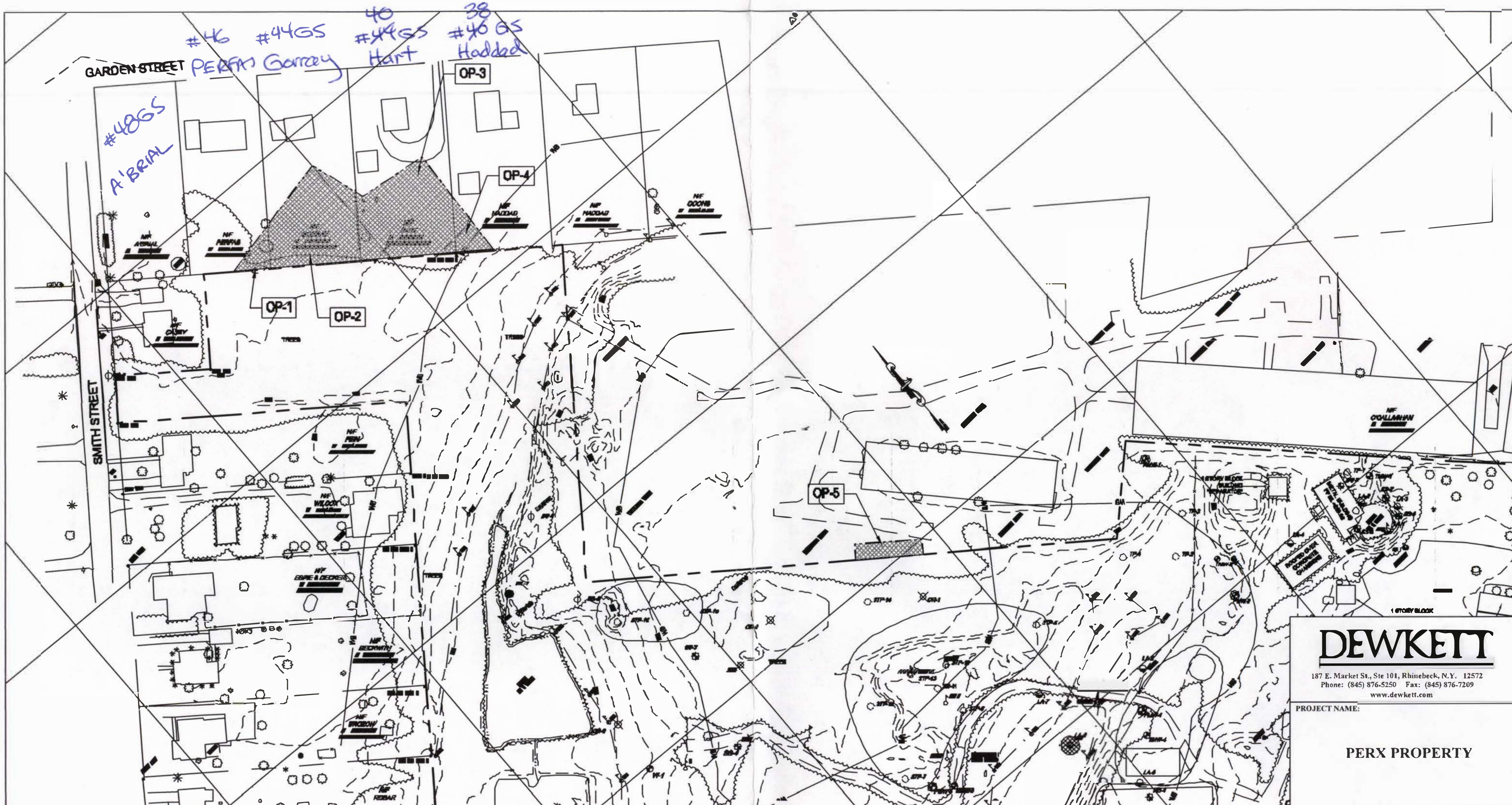
PERX PROPERTY

TITLE OF DRAWING:

OFF PROPERTY REMEDIATION AREAS

Project No: 05007.000	Date: April 7, 2006	Scale: 1"=100'
File Name: 05007_RI01	DRAWING NO:	
Design By: NA	**D-1**	
Checked By: NA		
Drafted By: HMW	Sheet 1 of 1	

Drawing Name: F:\2005\05007.000 - Perx Property - Brownfield\Dwg\Working\RD1-05007.dwg
Xref's Attached: 05007_avy; 05007_Perx; 05007_ExistPlan
Date Printed: Apr 07, 2006, 4:56pm



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Xref's Attached: 05007_svy; 05007_Perx; 05007_ExistPlan
Date Printed: Apr 07, 2006, 4:56pm

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PROJECT NAME:

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Project No:	Date:	Scale:
05007.000	April 7, 2006	1"=100'

File Name: 05007_RD01	DRAWING NO:
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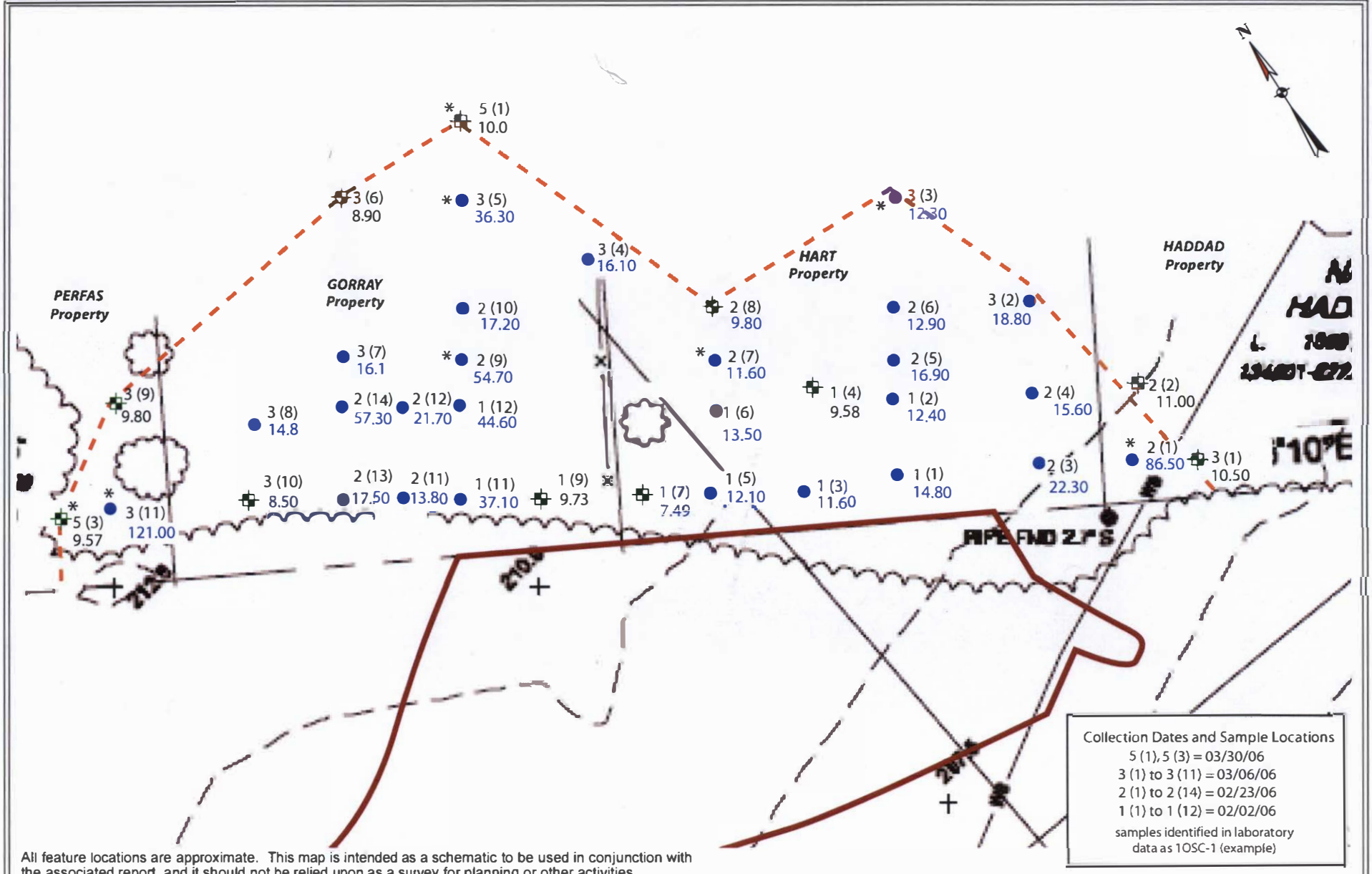

All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Fieldwork Map - Figure 2

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7395 South Broadway
Village of Red Hook
Dutchess County, New York

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- sample location
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2 (8) = sample ID
9.80 = Arsenic consentrations (ppm)

ESI File: DR99140.45
April 2006
Scale: 1" = 30' approximately
Attachment

ATTACHMENT C

Draft Scope of Work for Soil Removal

Scope of Work for Soil Excavation at
Residential Properties Adjoining the Perx Property
Located at 7395 South Broadway, Village of Red Hook, Dutchess County, New York
NYSDEC: B-00177-3 ESI File: DR99140.45

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Introduction

This Scope of Work (SOW) is prepared by Ecosystems Strategies, Inc. (ESI) on behalf of Dutchess County (DC) for the purpose of outlining procedures to be followed during soil removal activities on specified properties located to the north of the Perx Property. These off-site adjoining properties are identified as the following parcels in Map 6272, Block 9:

- Lot 220675 (Haddad) 38 Garden Street
- Lot 211679 (Hart) 40 Garden Street
- Lot 202683 (Gorray) 44 Garden Street
- Lot 194686 (Perfas) 46 Garden Street

The location of the Perx Site and these adjoining properties is shown generally in Figure 1 of Attachment A. The specific area of work is shown in Figure 2 of Attachment A.

Known Environmental Conditions

Previous environmental investigations (conducted by ESI) have identified elevated concentrations of arsenic in surface soils, likely the result of the former use of the area as an apple orchard. Previous testing documented levels of arsenic in surface (0-4" depth) soils ranging from 5.27 to 121.00 parts per million (ppm). Subsurface soils (10"-12") contain arsenic levels ranging from 4.58 to 8.18 ppm and deeper sols (20" – 24") contain arsenic levels ranging from 5.27 to 6.71 ppm. Previous testing results are summarized in Tables 1 to 4 of the Attachment B.

The "Soil Removal Area" (SRA) is defined as soils exceeding the site-specific guidance level for arsenic, identified in the Record of Decision at 11.1 ppm. The dimensions of the SRA are shown in Figure 2. The total volume of soils subject to removal is estimated at 610 yd^3 assuming a removal depth of 12 inches below surface grade.

Health and Safety

Soil removal and site restoration activities will be conducted under an approved Health and Safety Plan (HASP) which will include a Community Air Monitoring Plan (CAMP). The HASP will address concerns relating to worker safety during soil excavation and waste handling; the CAMP will address concerns relating to the protection of residents from fugitive dust during soil removal. A Draft HASP and CAMP are included as Attachment C.

Description of Proposed Excavation Activities

Soil removal activities will consist of the activities described below. The identified remediation contractor is responsible for completing these activities in a manner which is least disruptive to both surface and subsurface conditions on the residential properties. The identified remediation contractor will become familiar with surface conditions (e.g. property specific landscaping, swing sets, sheds, etc.) Further, the contactor will proceed with caution understanding the known or possible presence of septic leachfields within the boundary of soils subject to removal.

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Soil removal activities will consist of the following:

- Removal of the upper 12 inches of soil within the defined SRA. Soils will be scraped carefully to minimize the potential for damage to subgrade septic system distribution piping. The contractor will use equipment designed to minimize damage to any subsurface structures.

- Soils will be stockpiled on plastic (minimum of 6 mil. thickness) if on-site storage is required (excavation of soil and direct loading into trucks eliminates the need for storage on plastic). Soil subject to on-site stockpiling will be covered with 6 mil plastic, with such covering secured by weighing material capable of maintaining the integrity of the cover under normal wind and rain conditions.

- Soil excavation will continue to the defined limits of the SRA; such demarcation will be provided in schematic form (see Figure 2) and the field by ESI personnel.

- Soils will be removed from the adjoining properties using trucks licensed to transport non-hazardous soils. Trucks will use the truck route established for soils previously removed from the Perx Site. Care will be taken to remove dirt from the outside of the truck prior to the truck exiting the Site. All trucks will provide documentation necessary to transport these soils from the Site to a licensed repository; all manifests will be signed by ESI as agent for DC.

- Soils will be transported to a repository licensed to accept the soils from the SRA. Documentation of repository adequacy must be provided prior to the removal of any soils from the SRA.

Post-Excavation Soil Testing

No post-excavation soil testing will be required as a sufficient number of end points (both vertical and horizontal) have been collected and analyzed. Site restoration work can commence after the identified contaminated soils have been removed and a physical inspection with photographic documentation has occurred.

Site Restoration Activities

Site restoration will generally consist of returning the SRA to pre-removal conditions. Imported material will be used to return the SRA to pre-removal elevations and all landscaping that was removed as part of the remediation services will be replaced, unless so specified by the property owner. Any repair work necessary to restore the septic system leachfield will be completed prior to regrading.

Imported soils will consist of soils documented through laboratory testing to meet TAGM levels for the following parameters: VOCs, SVOCs, PCBs, chlorinated pesticides, and RCRA metals. One sample per borrow site is required.

The top 6 inches of replacement soils will be topsoil. Upon regarding, all areas will be seeded.

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Project Documentation

The remediation contractor will be responsible for providing ESI with the following:

- Completed manifest from the repository documenting proper disposal of all excavated soils;
- Laboratory data packages for all imported soils;
- Photos (digital) documenting site restoration; and
- Any records associated with septic system drainage and replacement/restoration.

ATTACHMENTS

A *Maps - Site Location Map – Figure 1*
Fieldwork Map - Figure 2
B *Data Tables*
C *Draft HASP and CAMP*

Table 1: Metals in Soil from Properties Adjacent to Area C, February 2, 2006

Results provided in mg/kg (parts per million). Results shown in **bold** exceed guidance levels.

Metal	Guidance Level	Eastern USA Background	Sample Identification												
			Hart Property									Gorray Property			
			OSC1 (0-4")	OSC1 (20-24")	OSC2 (0-4")	OSC3 (0-4")	OSC3 (20-24")	OSC4 (0-4")	OSC5 (0-4")	OSC5 (20-24")	OSC6 (0-4")	OSC7 (0-4")	OSC9 (0-4")	OSC11 (0-4")	OSC11 (20-24")	OSC12 (0-4")
Arsenic	**11.1**	**3 – 12**	**14.80**	6.19	**12.40**	**11.60**	5.27	9.58	**12.10**	6.71	**13.50**	7.49	9.73	**37.10**	5.51	**44.60**
Lead	**400**	**4 – 500****	42.40	9.31	43.30	50.80	9.60	76.80	33.00	10.60	32.30	22.80	47.20	93.30	8.19	117.00

Notes:

Guidance levels from site specific NYSDEC ROD. Eastern USA background data from TAGM 4046.

** Background lead concentrations in urban settings typically range from 200 to 500 ppm.

Table 2: Metals in Soil from Properties Adjacent to Area C, Febuary 23, 2006

Results provided in mg/kg (parts per million). Results shown in **bold** exceed guidance levels.

Metal	Guidance Level	Eastern USA Background	Sample Identification													
			Haddad Property		Hart Property						Gorray Property					
			2OSC-1	2OSC-2	2OSC-3	2OSC-4	2OSC-5	2OSC-6	2OSC-7	2OSC-8	2OSC-9	2OSC-10	2OSC-11	2OSC-12	2OSC-13	2OSC-14
Arsenic	**11.1**	**3 – 12**	**86.50**	11.00	**22.30**	**15.60**	**16.90**	**12.90**	**11.60**	9.80	**54.70**	**17.20**	**13.80**	**21.70**	**17.50**	**57.30**
Lead	**400**	**4 – 500****	**1,990**	66	55	38.4	161	102	50.1	60.2	166	66.8	62.5	77	62.4	158

Notes:
Guidance levels from site specific NYSDEC ROD. Eastern USA background data from TAGM 4046.
** Background lead concentrations in urban settings typically range from 200 to 500 ppm.

Table 3: Metals in Soil from Properties Adjacent to Area C, March 6, 2006

Results provided in mg/kg (parts per million). Results shown in **bold** exceed guidance levels.

Metal	Guidance Level	Eastern USA Background	Sample Identification										
			Haddad Property	Hart Property		Gorray Property						Perfas Property	
			3OSC-1	3OSC-2	3OSC-3	3OSC-4	3OSC-5	3OSC-6	3OSC-7	3OSC-8	3OSC-10	3OSC-9	3OSC-11
Arsenic	**11.1**	**3 – 12**	10.5	**18.8**	**12.3**	**16.1**	**36.3**	8.9	**16.1**	**14.8**	8.5	9.8	**121**
Lead	**400**	**4 – 500****	58.1	50.1	84.2	38.5	87.8	29.7	49	50.8	23.7	36.2	285

Notes:
Guidance levels from site specific NYSDEC ROD. Eastern USA background data from TAGM 4046.
** Background lead concentrations in urban settings typically range from 200 to 500 ppm.

Table 4: Metals in Soil from Properties Adjacent to Area C, March 30, 2006

Results provided in mg/kg (parts per million). Results shown in **bold** exceed guidance levels.

Metal	Guidance Level	Eastern USA Background	Sample Identification							
			Haddad Property	Hart Property		Gorray Property			Perfas Property	
			2OSC-1 (10-12")	2OSC-7 (10-12")	3OSC-3 (10-12")	2OSC-9 (10-12")	3OSC-5 (10-12")	5OSC-1	3OSC-11 (10-12")	5OSC-3
Arsenic	**11.1**	**3 – 12**	4.58	6.58	6.63	7.09	6.21	10.00	8.18	9.57
Lead	**400**	**4 – 500****	12.7	15.8	27.2	16.3	11.7	36.3	15.4	69.5

Notes:
Guidance levels from site specific NYSDEC ROD. Eastern USA background data from TAGM 4046.
** Background lead concentrations in urban settings typically range from 200 to 500 ppm.

Septic Remediation

The typical lateral for a septic system is installed at an 18" depth to the lateral invert. This means that the depth to the top of the lateral pipes is estimated at 12 to 14 inches. The soil remediation depth being recommended for this area is 12". Damage to the existing laterals can be anticipated by means of teeth on the digging bucket, crushing by equipment running over the excavated depth, or a combination of both activities.

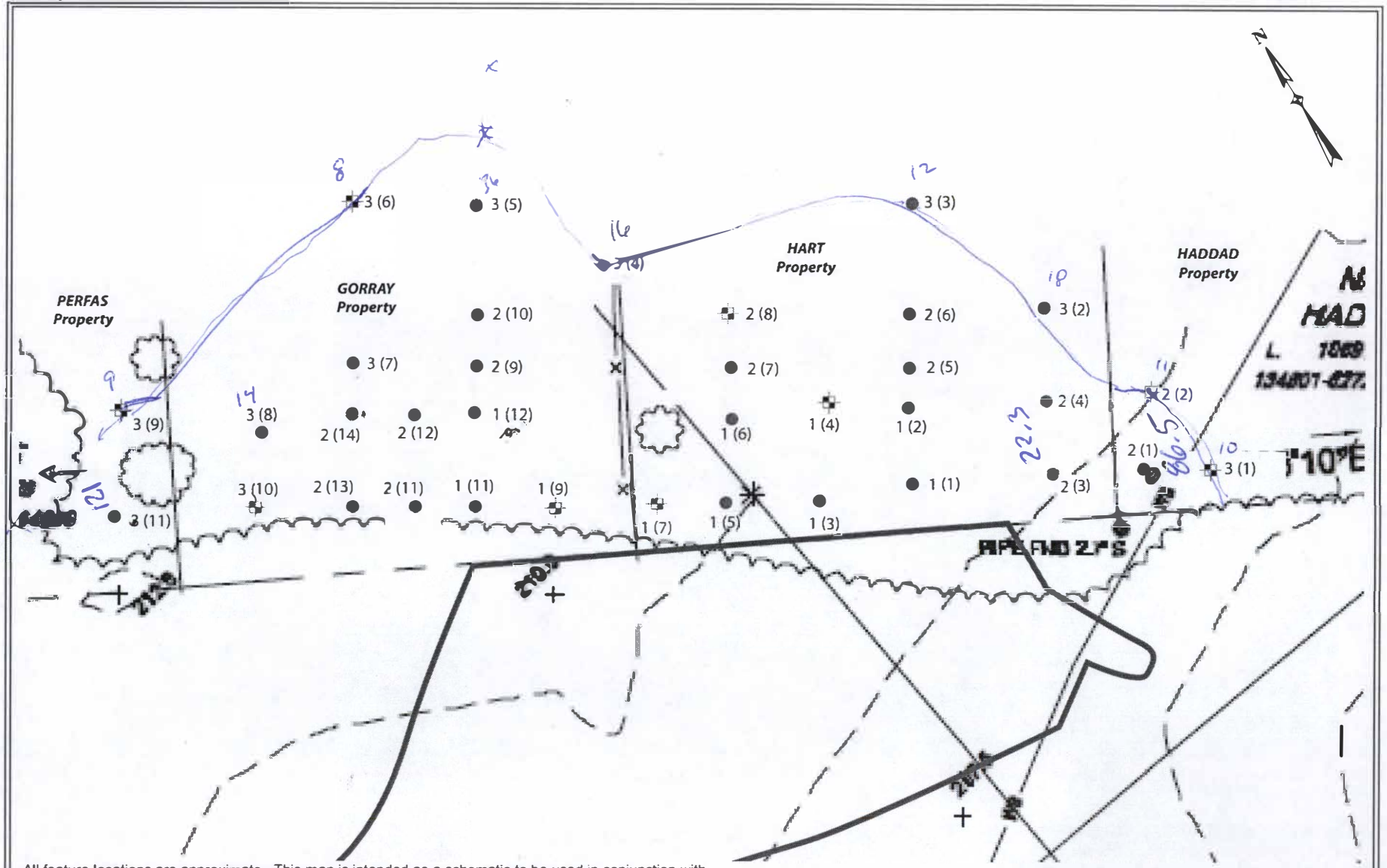
Digging depending on the location of the septic systems could damage all four systems. Two systems, those belonging to Gorray and Hart, will be subject to damage by either means. Our involvement with Perfas is back in a tree line and should be beyond the laterals. The involvement at Haddad's property occurs behind a small shed and likewise should be beyond the laterals, although we're taking part of his garden (freshly tilled this past weekend.) Work on Perfas and Haddad's property does not require equipment to cross on top of any fields and most work can be accomplished from their neighbor's property.

We have a number of options.

1. ***Replace just the visible damaged portions of the laterals.*** This would work fine for the 2 properties where we do not anticipate involvement with the fields but would leave the County open to future lawsuits or improvements for the systems of Hart and Gorray.

2. ***Plan to replace the two fields with the most involvement, those of Hart and Gorray.***
    a. As a replacement system we could determine the size of the existing system by excavation and replace in kind. This would not address the changes in the codes since the installation of the systems in the 1960's
    b. We could guess, at the moment, to estimate that each house has between 3 and 4 bedrooms and an optimally 5 minute perc based on the soil evidence we've seen so far; that would mean that we could we would be replacing 4 laterals at between 50 to 60 feet each for each lateral for each house. A percolation test, while not required by the health department for a "replacement" system, would be appropriate as a measure in assurance and documenting that the systems were brought to current standards.

The recommendation is to plan to replace the two fields with the most involvement, those of Hart and Gorray, taking a percolation test to determine the optimum sizing based on current standards, and to closely monitor the work on the adjacent properties to minimize the possibility of damage to their systems.



All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Fieldwork Map - Supplemental Soil Sampling Area "C" Neighboring Properties

Perx Property
7395 South Broadway
Village of Red Hook
Dutchess County, New York

Legend:

- sample location
- sample location with exceedences
- portion of area of recommended excavation

Collection Dates
3 (1) to 3 (11) = 03/06/06
2 (1) to 2 (14) = 02/23/06
1 (1) to 1 (12) = 02/02/06
samples identified in laboratory data as 1OSC-1 (example)

ESI File: DR99140.45
March 6, 2006
Scale: 1" = 30' approximately
Attachment A