ADDENDUM 2
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WORK PLAN

Lehigh Valley Railroad Derailment Superfund Site
LeRoy, New York
Index Number CERCLA-02-2006-2006

LEHIGH VALLEY RAILROAD COMPANY
CINCINNATI, OHIO 45202

Prepared By:

Unicorn Management Consultants, LLC
52 Federal Road, Suite 2C
Danbury, CT 06810

October 30, 2009

Responsiveness • *Solutions* • *Quality*

DOCUMENT AUTHORIZATION FORM

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October 30, 2009

AUTHORIZATIONS:

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Date

10/30/09

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Date

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1 INTRODUCTION

This document, "Addendum 2 Remedial Investigation/Feasibility Study Work Plan", was prepared by Unicorn Management Consultants, LLC (UMC) on behalf of the Lehigh Valley Railroad Company (LVRR). LVRR is the respondent of the Settlement Agreement and Order on Consent for Pre-Remedial Design Investigations, Remedial Design, and Remedial Investigation/Feasibility Study, Index Number CERCLA-02-2006-2006 (hereinafter, "SA") for the Lehigh Valley Railroad Derailment Superfund Site located in Genesee, Monroe and Livingston Counties, near the Town of LeRoy, New York (hereinafter, the "Site"), which was issued by the United States Environmental Protection Agency (hereinafter, "EPA"), effective date October 6, 2006. The SA requires LVRR to conduct a Remedial Investigation/Feasibility Study (RI/FS) in accordance with the RI/FS Work Plan dated February 13, 2002 and addendum dated September 11, 2006, attached thereto as Appendix C. This document is Addendum 2 to the RI/FS Work Plan. Once approved by EPA, it will amend the RI/FS Work Plan.

2 MONITORING WELL LOCATIONS

[Amends Section 3.3.3 Hydrogeological Assessment (Subtask 3.0.3)]

Monitoring wells will be installed at the 17 locations shown on Figure 1, designated LVRR-18 through LVRR-35. The rationale for selecting each of these locations is provided on Table 1.

3 AQUIFER PUMPING TEST WELL

[Amends Section 3.3.3 Hydrogeological Assessment (Subtask 3.0.3); Section 3.3.4 Monitoring Well Drilling and Testing (Subtask 3.0.4); and, Section 3.3.4.4 Aquifer Testing (Subtask 3.04.04)]

Design and performance of the aquifer test will be postponed until the disposition of DNAPL and potential for remobilization is better understood.

4 MONITORING WELL INSTALLATION AND CONSTRUCTION

[Amends Section 3.3.4 Monitoring Well Drilling and Testing (Subtask 3.0.4) and Section 3.3.4.1 Downhole Geophysics and Packer Testing (Subtask 3.04.01)]

Monitoring wells will be installed as follows:

- A six inch diameter core will be advanced by air rotary methods at each drilling location to the depth indicated on Table 1. Note: monitoring well LVRR-33 will be cored first to depth to collected samples for rock matrix testing and then reamed by air rotary;
- A Flexible Liner Underground Technologies ("FLUTe") Liner NAPL Ribbon sampler will be deployed to determine presence of NAPL at select locations (LVRR-19, 20, 28, 29 and 30);

- Down-hole geophysics (optical televiewer, acoustic televiewer, deviation, caliper, temperature, gamma, spontaneous potential, fluid resistivity, and bore-hole flow meter measurement under ambient and pumping conditions) will be conducted in each borehole;
- Packer testing will be conducted and groundwater samples collected for on-site laboratory analysis for TCE on select zones in each bore hole;
- Continuous hydraulic conductivity profiling using FLUTe Liner technology will be performed in each bore hole; and
- A FLUTe System multi-zone sampling system will be installed in each bore hole.

5 MONITORING WELL SAMPLING METHODOLOGY

[Amends Section 3.3.5.1 Monitoring Well Groundwater Sampling (Subtask 3.05.01)]

The newly installed wells will be sampled using FLUTe System multi-zone sampling devices.

The first round of quarterly sampling in existing wells will be conducted using low flow groundwater sampling methodology in order to collect field parameters and natural attenuation (MNA) characterizations samples specified in the RI/FS Work Plan. MNA sample results will be screened using EPA guidance and a determination made as to the necessity for further MNA sampling. Existing monitoring wells will be sampled using Passive Diffusion Bags (PDBs) in subsequent rounds if MNA sampling is not required.

Low flow sampling methodology will be used for the one-time post-storm sampling event.

6 SPRING/SEEP AND SURFACE WATER/SEDIMENT SAMPLING LOCATIONS

[Amends Section 3.3.5.2 Spring/Seep and Surface Water/Sediment Sampling (Subtask 3.05.02)]

Water samples, and sediment samples if present, will be collected at the 17 spring/seep locations listed on Table 2. These 17 locations are indicated on Figures 2a, 2b and 2c.

Sediment samples will be collected from the 37 locations listed on Table 3 and shown on Figures 3a, 3b, 3c, and 3d.

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TABLES

TABLE 1

MONITORING WELL RATIONAL AND TARGETED DEPTHS

Addendum 2 RI/FS Workplan

LEHIGH VALLEY RAILROAD DERAILMENT SUPERFUND SITE

Unicorn Management Consultants, LLC

WELL ID	PURPOSE/RATIONALE	Maximum Anticipated Depth[1]	Sample Ports (Minimum)
LVRR-18	Upgradient background well. Physically accessible. Written access agreement in place with property owner	170'	4
LVRR-19	Aquifer test well location. Part of monitoring well transect across neck of plume. Physically accessible. Written access agreement with property owner.	160'	4
LVRR-20	Evaluate potential movement toward Mud Creek and Northern Edge Physically accessible. Verbal access agreement with property owner.	130'	4
LVRR-21	Evaluate potential movement toward Ephemeral Ponds and Northern Edge Physically accessible. Written access agreement in place with property owner	125'	4
LVRR-22	Evaluate potential downgradient movement to north and east. Physically accessible. Verbal access agreement with cooperative property owner.	30'	2
LVRR-23	Evaluate potential movement toward spring fed Ponds and Northern Edge Physically accessible. Written access agreement in place with property owner	30'	1
LVRR-24	Evaluate potential downgradient movement across Spring Creek. Physically accessible. Verbal access agreement with cooperative property owner.	60'	3
LVRR-25	Evaluate potential downgradient movement across Spring Creek. Physically accessible. Verbal access agreement with property owner.	90'	3
LVRR-26	Evaluate southern edge. Physically accessible. Written access agreement with property owner.	195'	3

TABLE 1

MONITORING WELL RATIONAL AND TARGETED DEPTHS
Addendum 2 RI/FS Workplan
LEHIGH VALLEY RAILROAD DERAILMENT SUPERFUND SITE

Unicorn Management Consultants, LLC

WELL ID	PURPOSE/RATIONALE	Maximum Anticipated Depth[1]	Sample Ports (Minimum)
LVRR-27	Part of monitoring well transects across neck of plume. Physically accessible. Written access agreement with property owner.	220	4
LVRR-28	Part of monitoring well transect across neck of plume. Physically accessible. Written access agreement with property owner.	165	4
LVRR-29	Part of monitoring well transect across neck of plume. Physically accessible. Written access agreement with property owner.	160'	4
LVRR-30	Part of monitoring well transect across neck of plume. Physically accessible. Written access agreement with property owner.	190'	4
LVRR-31	Part of monitoring well transect across neck of plume. Physically accessible. Written access agreement with property owner.	176'	4
LVRR-32	Part of monitoring well transects across neck of plume. Physically accessible. Written access agreement with property owner.	160'	4
LVRR-33	Part of monitoring well transects across neck of plume. Physically accessible. Written access agreement with property owner.	170'	4
LVRR-34	Approximately 1400' south (down-dip) of spill. Physically accessible. Written access agreement with property owner.	150'	4

[1] Maximum depth based on expected contact of the Lower Camillus and Syracuse Formations.

TABLE 2

SEEP/SPRING SAMPLING LOCATIONS
Addendum 2 RI/FS Work Plan
LEHIGH VALLEY RAILROAD DERAILMENT SUPERFUND SITE

Unicorn Management Consultants, LLC

SPRING NUMBER	FIGURE NO.	LOCATION	DESCRIPTION
RECON SPR - 01	2a	MUD CREEK AT FALLS	MIDWAY DOWN FALLS IN MUD/SEDIMENT LAYER - PLUNGE POOL DRY
RECON SPR - 02	2a	MUD CREEK BELOW FALLS	WHERE CREEK RE-EMERGES 250' BELOW FALLS - 3"
RECON SPR - 03	2a	MUD CREEK BELOW FALLS	WHERE CREEK RE-EMERGES 500' SOUTH OF POND - NO SEDIMENT
RECON SPR - 04	2a	MUD CREEK GORGE POND	SMALL TRIBUTARY AT SOUTH END OF POND NEAR HOUSE - RESIDENTIAL SOURCE
RECON SPR - 05	2b	SPRING CREEK	WETLAND AT BASE OF WOODED SLOPE - 6"
RECON SPR - 06	2b	SPRING CREEK	SEDIMENT WITHIN SPRING-FED 10X6 COLLECTION CONCRETE TROUGH - 18" - HS SMELL
RECON SPR - 07	2b	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 3-5"
RECON SPR - 08	2b	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 1-3"
RECON SPR - 20	2b	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 12"
RECON SPR - 12	2c	SPRING CREEK	IN COLLECTION POOL - 1-3"
RECON SPR - 14	2c	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 2"
RECON SPR - 17	2c	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 2-3"
RECON SPR - 18	2c	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 2-3"
RECON SPR - 19	2c	NA	SPRING CREEK
RECON SPR - 22	2c	NA	SPRING CREEK
RECON SPR - 23	2c	NA	SPRING CREEK
RECON SPR - 25A/B	2c	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 1-3"

TABLE 3

SEDIMENT SAMPLING LOCATIONS

Addendum 2 RI/FS Work Plan

LEHIGH VALLEY RAILROAD DERAILMENT SUPERFUND SITE

Unicorn Management Consultants, LLC

SEDIMENT NUMBER	FIGURE NUMBER	LOCATION	DESCRIPTION
RECON SED - 00	3a	MUD CREEK	IN BEDROCK DEPRESSION OF MUD CREEK S OF TRANSMISSION LINE - DRY - ALLUVIAL BUILDUP IMMEDIATELY DOWNSTREAM
RECON SED - 02	3a	MUD CREEK AT FALLS	MIDWAY DOWN FALLS IN MUD/SEDIMENT LAYER - PLUNGE POOL DRY
RECON SED - 03	3a	MUD CREEK BELOW FALLS	WHERE CREEK RE-EMERGES 250' BELOW FALLS - 3"
RECON SED - 04	3a	MUD CREEK GORGE POND	SEEP FROM DAM - 4-5"
RECON SED - 08	3a	MUD CREEK	WETLAND NORTH OF POND - 10X100
RECON SED - 55	3a	OATKA CREEK	IN OATKA CREEK DOWNSTREAM FROM MUD CREEK IN POOL FORMED BY LARGE BOULDER AT SG-04
RECON SED - 57	3a	MUD CREEK	IN NW EDGE OF LARGE POND BY OLD DOCK
RECON SED - 32	3b	OATKA CREEK	IN "DUCK POND" - FLOATING VEGETATION
RECON SED - 34	3b	OATKA CREEK	IN UNNAMED POND EAST OF HIDDEN POND - LITTLE VEGETATION
RECON SED - 35	3b	OATKA CREEK	IN "THREE ISLAND POND" - WATER CLEAR - LITTLE VEGETATION
RECON SED - 37	3b	OATKA CREEK	IN "LAKE SURPRISE" - LARGE AND SHALLOW
RECON SED - 38	3b	OATKA CREEK	IN UNNAMED POND NORTH OF LODGE - FLOATING VEGETATION
RECON SED - 40	3b	OATKA CREEK	IN "NEWT POND" - CLEAR, LILY PADS
RECON SED - 41	3b	OATKA CREEK	IN "GOOSE POND" - FLOATING VEGETATION
RECON SED - 49	3b	EPHEMERAL POND	IN WET DEPRESSION (15X25) OF DRY POND SURROUNDED BY MEADOW - 12" AT SG-01

TABLE 3
SEDIMENT SAMPLING LOCATIONS
Addendum 2 RI/FS Work Plan
LEHIGH VALLEY RAILROAD DERAILMENT SUPERFUND SITE

Unicorn Management Consultants, LLC

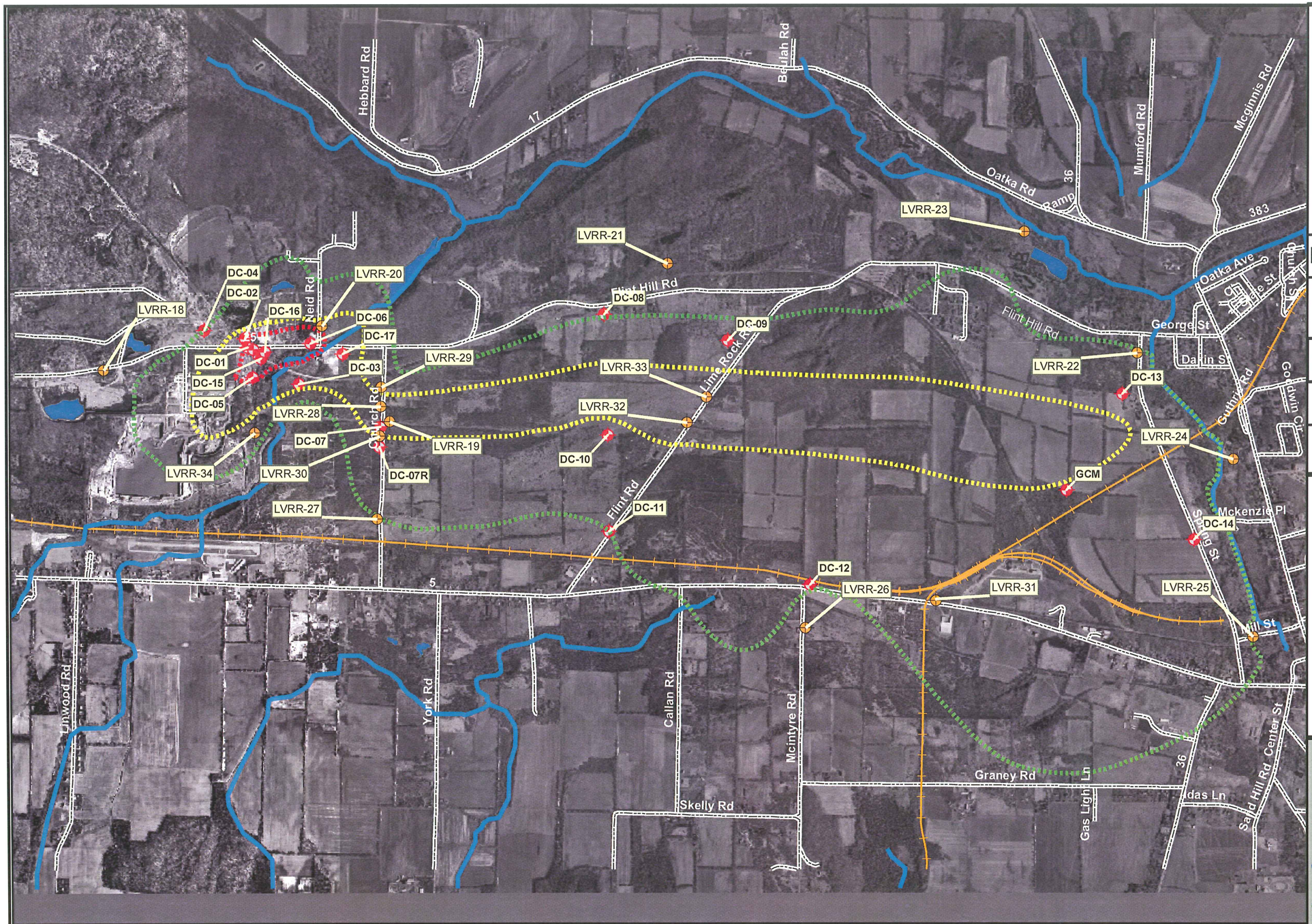
SEDIMENT NUMBER	FIGURE NUMBER	LOCATION	DESCRIPTION
RECON SED - 50	3b	EPHEMERAL POND	IN WET DEPRESSION (8X8) OF DRY POND SURROUNDED BY MEADOW- 2"
RECON SED - 51	3b	OATKA CREEK	IN OATKA CREEK BEHIND "LAKE SURPRISE" AT SG-02
RECON SED - 52	3b	OATKA CREEK	IN ORPHAN OXBOW OF OATKA CREEK
RECON SED - 53	3b	GORGE POND	IN WET WOODS AT CONFLUENCE OF EPHEMERAL POND DRAINAGE AND OATKA CREEK
RECON SED - 54	3b	OATKA CREEK	IN OATKA CREEK UPSTREAM OF CONFLUENCE OF EPHEMERAL POND DRAINAGE NEAR MUSEUM PROPERTY BORDER AT SG-03
RECON SED - 10	3c	SPRING CREEK	WETLAND AT BASE OF WOODED SLOPE - 6"
RECON SED - 11	3c	SPRING CREEK	SEDIMENT WITHIN SPRING-FED 10X6 COLLECTION CONCRETE TROUGH - 18" - HS SMELL
RECON SED - 12	3c	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 3-5"
RECON SED - 13	3c	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 1-3"
RECON SED - 17	3c	SPRING CREEK	IN COLLECTION POOL - 1-3"
RECON SED - 25	3c	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 12"
RECON SED - 27	3c	SPRING CREEK	WETLAND WEST OF CREEK
RECON SED - 28	3c	GUTHRIE CREEK	NORTH SIDE OF GUTHRIE CREEK - 6"
RECON SED - 29	3c	GUTHRIE CREEK	IN DEPRESSION IN WEST END OF WOODED WETLAND NEAR CORNFIELD
RECON SED - 48	3c	OATKA CREEK	IN DEPOSITION IN POOLED WATER UNDER TWIN BRIDGE

TABLE 3
SEDIMENT SAMPLING LOCATIONS
Addendum 2 RI/FS Work Plan
LEHIGH VALLEY RAILROAD DERAILMENT SUPERFUND SITE

Unicorn Management Consultants, LLC

SEDIMENT NUMBER	FIGURE NUMBER	LOCATION	DESCRIPTION
RECON SED - 18	3d	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 6-8" - FIRE SUPRESSION SYSTEM
RECON SED - 19	3d	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 2"
RECON SED - 20	3d	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 5-6"
RECON SED - 22	3d	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 2-3"
RECON SED - 23	3d	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 2-3"
RECON SED - 24	3d	SPRING CREEK	IN DEPRESSION OF DRAINAGE FROM RAILROAD EMBANKMENT - 3" - DRY
RECON SED - 42	3d	SPRING CREEK	IN DEPOSITION IN POOLED SPRING WATER - NUMEROUS SPRINGS FROM BOTTOM
RECON SED - 43	3d	SPRING CREEK	IN DEPOSITION IN POOLED SPRING WATER - NUMEROUS SPRINGS FROM BOTTOM
RECON SED - 45	3d	SPRING CREEK	IN DEPRESSION OF DRAINAGE - 1-3"

FIGURES



2,000 1,000 0 2,000 4,000 Feet

Existing & Proposed Monitoring Wells

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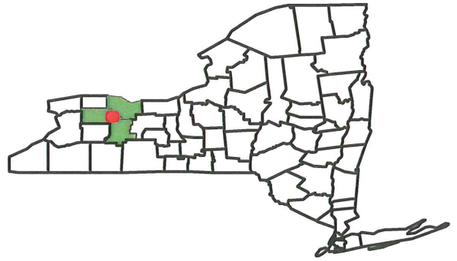
Project Name: Lehigh Valley Railroad Derailment Superfund Site

RI/FS WP Addendum 2 Figure 1

Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08 **Revised:** 10/30/09
Scale: 1 in:2,000 ft	**File:** Figure1

New York State



Legend

- Proposed Monitoring Wells
- Existing Monitoring Wells
- Railroad
- Roads
- Rivers

Estimate of Lateral Limits of 2008 TCE Concentrations*

- ND (1)
- > 100 ppb
- > 1000 ppb

* Based on Site Reconnaissance data from existing monitoring wells and other available non-monitoring wells sampled in 2008. Highest concentration detected at well location used regardless of sampled depth. Purpose of plume representation for placement of new monitoring wells only.

N
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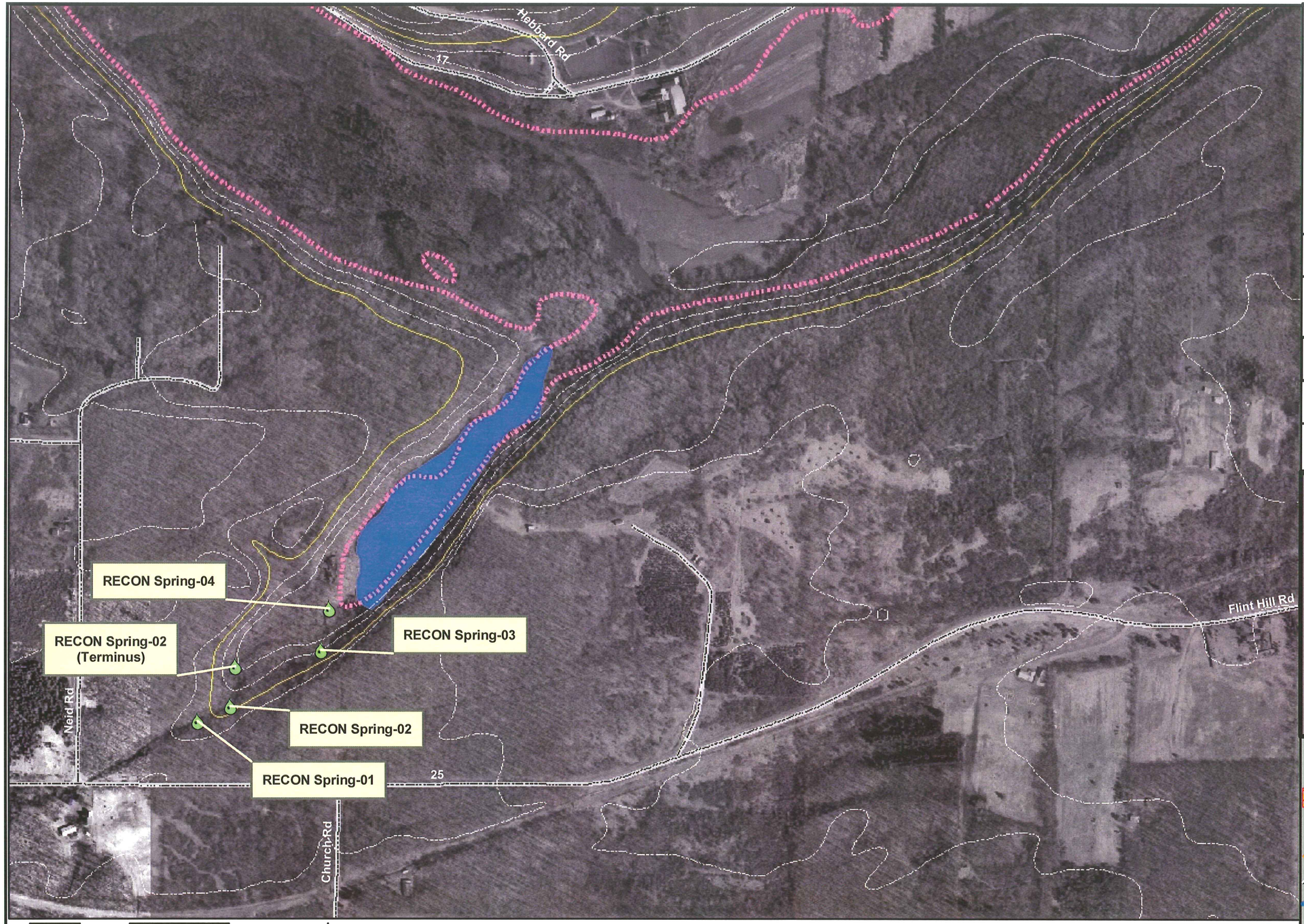

500 250 0 500 1,000 Feet

Proposed Phase 1 Spring/Seep Sampling Locations
Mud Creek/Gorge Pond Area

N
W E
S

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RI/FS WP Addendum 2
Figure 2a

Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08 **Revised:** 10/30/09
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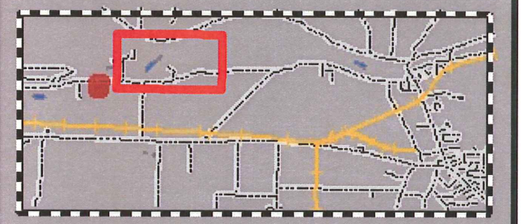
LVRR Work Area



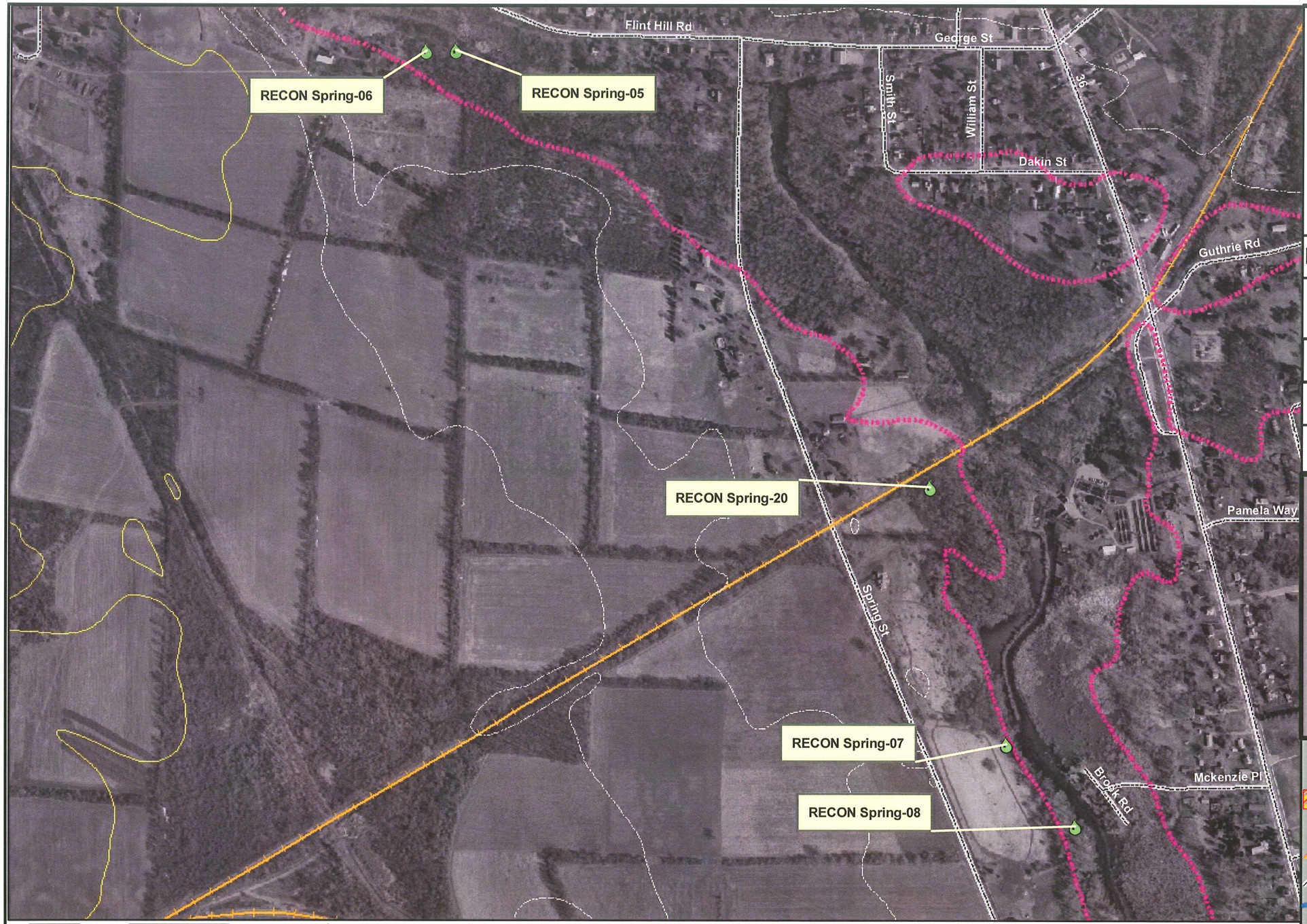
= Approximate Spill Area

Legend

- Approximate Spill Area
- Springs (6)
- Railroad
- Roads
- Rivers

20 Foot Contours

- 20 Foot Interval
- 600 Feet
- 640 Feet
- 700 Feet
- 800 Feet



500 250 0 500 1,000 Feet

Proposed Phase 1 Spring/Seep Sampling Locations
North Spring Street Area

N
W E
S

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RI/FS WP Addendum 2 Figure 2b

Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08
	Revised: 10/30/09
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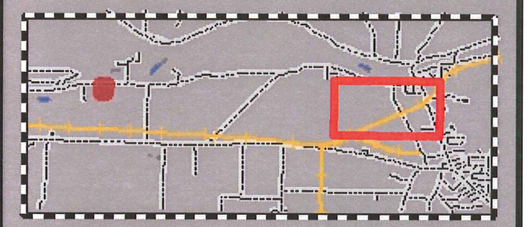
LVRR Work Area



= Approximate Spill Area

Legend

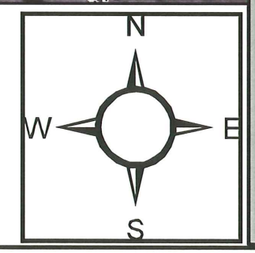
- Approximate Spill Area
- Springs (5)
- Railroad
- Roads
- Rivers

20 Foot Contours

- 20 Foot Interval
- 600 Feet
- 640 Feet
- 700 Feet
- 800 Feet

500 250 0 500 1,000 Feet

Proposed Phase 1 Spring/Seep Sampling Locations
South Spring Street Area



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RI/FS WP Addendum 2 Figure 2c

Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08
	Revised: 10/23/09
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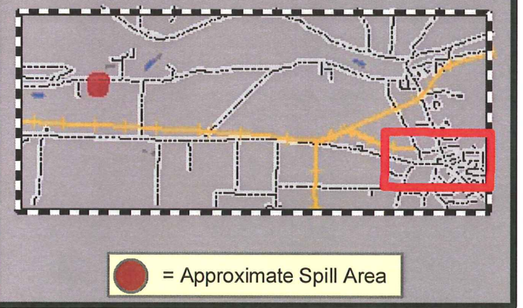
LVRR Work Area



Legend

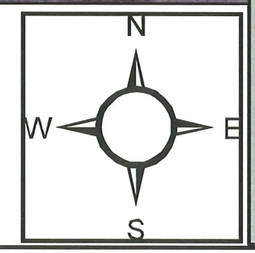
- Approximate Spill Area
- Springs (8)
- Railroad
- Roads
- Rivers

20 Foot Contours

- 20 Foot Interval
- 600 Feet
- 640 Feet
- 700 Feet
- 800 Feet

500 250 0 500 1,000 Feet

Proposed Phase 1 Sediment Sampling Locations
Spill Area/Gorge Pond



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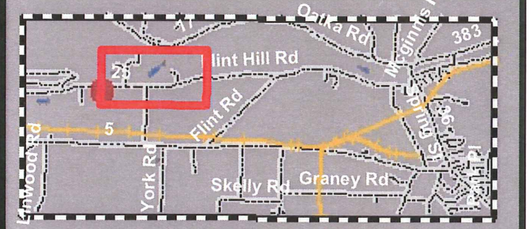
Project Name: Lehigh Valley Railroad Derailment Superfund Site

RI/FS WP Addendum 2
Figure 3a

Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08 **Revised:** 10/23/09
Scale: 1 in:500 ft	**File:** Figure3a

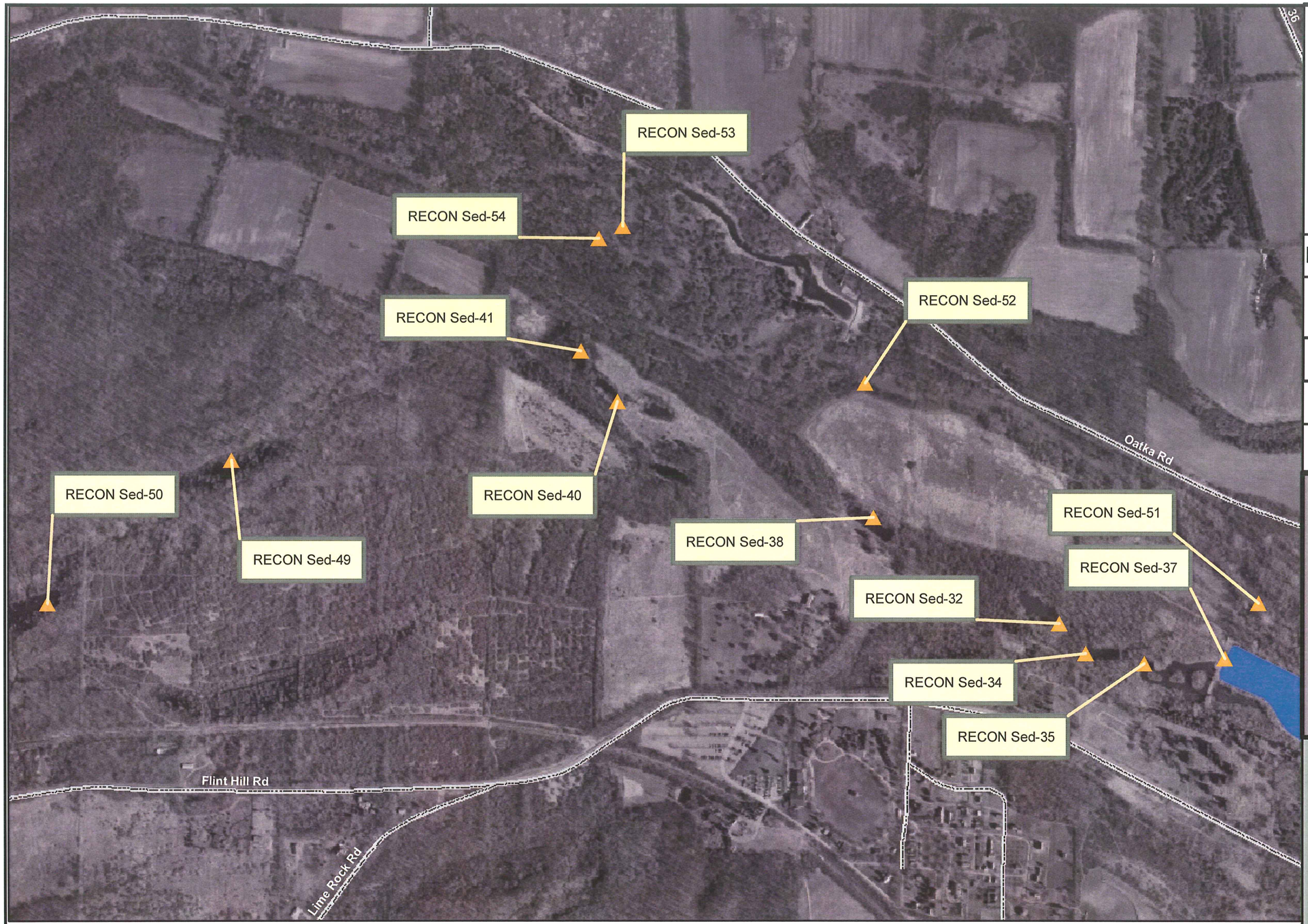
LVRR Work Area



= Approximate Spill Area

Legend

- Approximate Spill Area
- Sediment Sample Locations (8)
- Railroad
- Roads
- Rivers



600 300 0 600 1,200 Feet

Proposed Phase 1 Sediment Sampling Locations
Oatka Creek/Oatka Creek Uplands

N
W E
S

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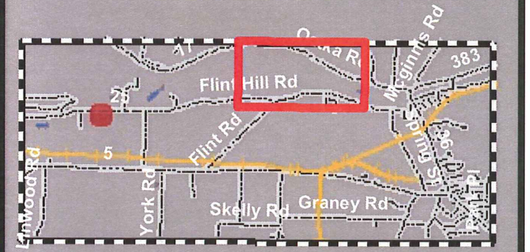
Project Name: Lehigh Valley Railroad Derailment Superfund Site

RI/FS WP Addendum 2 Figure 3b

Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08 **Revised:** 4/24/09
Scale: 1 in:600 ft	**File:** Figure3b

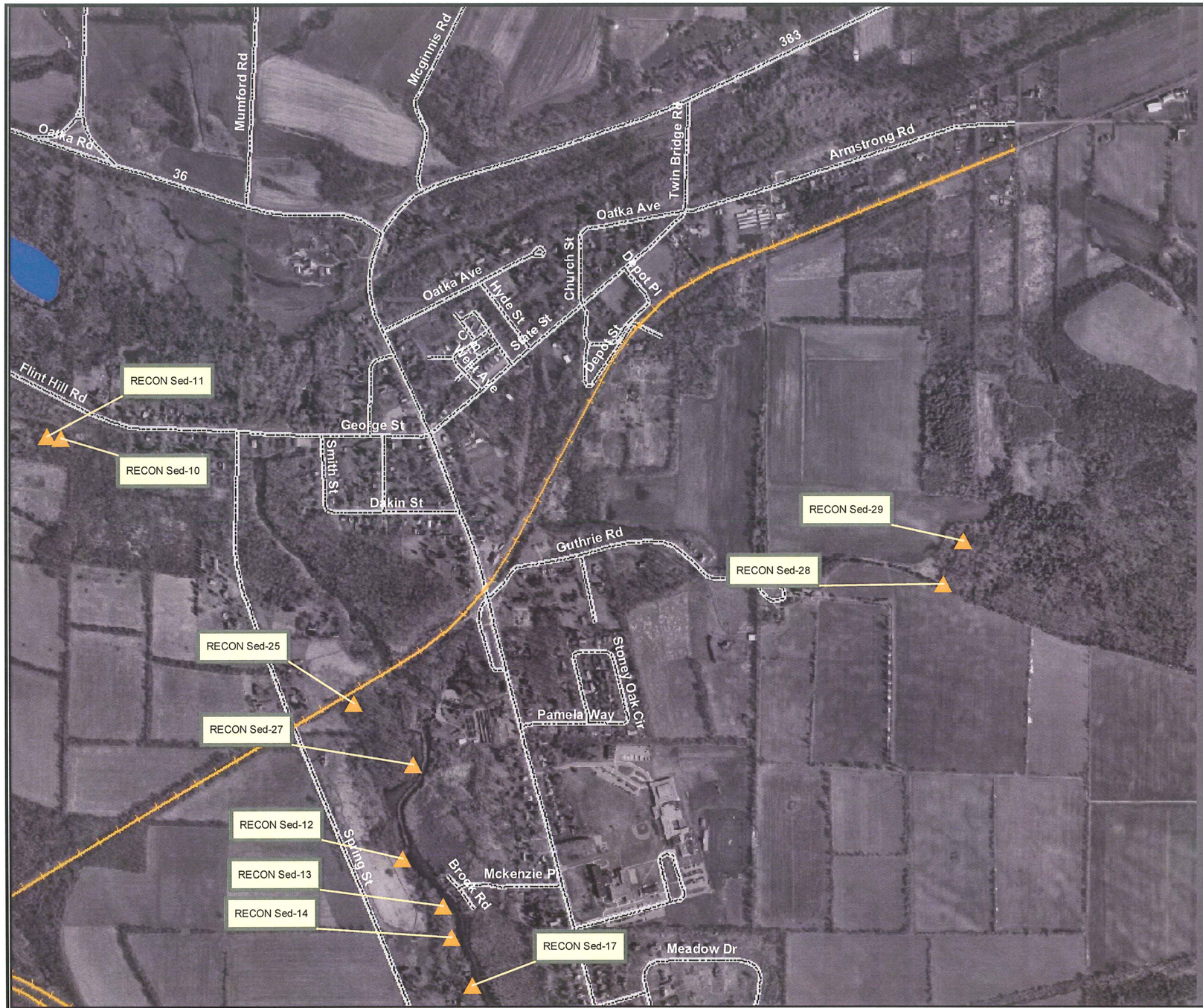
LVRR Work Area



= Approximate Spill Area

Legend

- Sediment Sample Locations (13)
- Railroad
- Roads
- Rivers



Proposed Sediment Sampling Locations
North Spring Street Area

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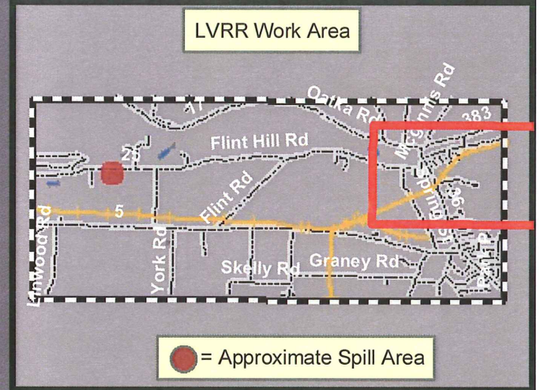
Project Name: Lehigh Valley Railroad Derailment Superfund Site	
RI/FS WP Addendum 2 Figure 3c	
Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08 **Revised:** 10/23/09
Scale: 1 in:900 ft	**File:** Figure3c



Legend

- Sediment Sample Locations (10)
- Railroad
- Roads
- Rivers

N
W E
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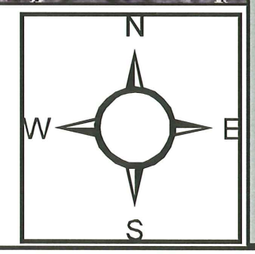
500 250 0 500 1,000 Feet

Proposed Phase 1 Sediment Sampling Locations
South Spring Street Area



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Project Name: Lehigh Valley Railroad Derailment Superfund Site

RI/FS WP Addendum 2
Figure 3d

Author: GPK	**Checked By:** KH
Project #: 2032	**Created:** 9/24/08 **Revised:** 10/23/09
Scale: 1 in:500 ft	**File:** Figure3d

Legend

- Sediment Sample Locations (9)
- Railroad
- Roads
- Rivers