EBIZNEWDOC

EBIZNEWDOC

Write or Copy/Paste Document Title In This Space

Report.HW.734043.1990-08-15.Storm_Sewer_System_Report.PDF

DO NOT PHOTOCOPY. PRINT FROM PDF VERSION ONLY.

EBIZNEWDOC

EBIZNEWDOC

REPORT

STORM SEWER SYSTEM REPORT

Carrier Corporation

Syracuse, New York

August 1990

BLASLAND & BOUCK ENGINEERS, P.C.
BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

STORM SEWER SYSTEM
REPORT

CARRIER CORPORATION
SYRACUSE, NEW YORK

AUGUST 1990

BLASLAND & BOUCK ENGINEERS, P.C.
6723 TOWPATH ROAD, BOX 66
SYRACUSE, NEW YORK 13214

TABLE OF CONTENTS

TABLE OF CONTENTS
(Cont'd.)

FIGURES

APPENDICES

Introduction

SECTION 1 - INTRODUCTION

1.1 General

This report presents the results of a field sampling program conducted by Blasland & Bouck Engineers, P.C., for Carrier Corporation. The sampling program involved the investigation of the State Pollutant Discharge Elimination System (SPDES) permitted stormwater outfalls and select storm sewer manholes at the Carrier Corporation manufacturing facility located on Thompson Road in the town of Dewitt, New York. The facility is shown on the site location map in Figure 1. The existing Carrier's SPDES permit, the purpose and scope of this report, and the organization of this report are described below.

1.2 Existing SPDES Permit

On August 1, 1989, Carrier Corporation was issued a five-year SPDES Permit (No. NY 0001163) by the New York State Department of Environmental Conservation (DEC). The SPDES permit (Appendix A) was modified by DEC on January 31, 1990, to re-allocate the phenol effluent limitations for the water quality total poundage available. The permit covers six outfalls designated as 001, 002, 005, 006, 007, and 008 that discharge into Sanders Creek. Sanders Creek flows from east to west just north of the Carrier facility (see Figure 1). The creek is designated as class "D/B" waters and discharges into Ley Creek (South Branch) approximately 1.8 miles west of the Carrier property.

The SPDES permit describes the six outfalls as follows:

Outfall Number	Description
001	AC cooling, test water, condensate, and stormwater
002	AC cooling, test waters, and stormwater
005	Springs and stormwater
006	AC condensate and stormwater
007	GW infiltration, AC condensate, and stormwater
008	GW infiltration, leak test, cooling, and stormwater

The permit specifies concentration-based effluent limits for TCE on permitted Outfalls 002 and 007 and concentration-based effluent limits for phenol on all permitted outfalls (see Table 1-1). The permitted outfalls are monitored monthly with grab-type samples. The SPDES Permit also specifies mass loading-based action levels for TCE on Outfalls 001, 005, 006, and 008 (see Table 1-2). These action levels are monitored each quarter with grab-type samples. When an action level is exceeded, the permit defines a three-day follow-up monitoring program to confirm the action level exceedance. A confirmed exceedance is regarded by the DEC as a modified SPDES permit application from which they can elect to adjust the action level or include the contaminant as a concentration-based permit limit. The permit requires Carrier Corporation to submit a Discharge Monitoring Report (DMR) to the DEC each month to report all required monitoring data for that month.

The current TCE and phenol limits and action levels assigned to Carrier Corporation in the existing SPDES Permit No. NY 0001163, effective August 1, 1989, and modified January 31, 1990, differ from the previously permitted limits. The prior five-year SPDES Permit No. NY 0001163 that was effective September 1, 1982, and expired September 1, 1987, assigned no TCE limits or action levels while the concentration-based effluent limits for phenol was 500 parts per billion (ppb).

1.3 Purpose and Scope

In the initial DMR submitted to the DEC on September 18, 1989, Carrier Corporation reported TCE levels in Outfalls 002 and 007 and phenol levels in Outfall 005 in excess of the permit limits. On September 29, 1989, Blasland & Bouck Engineers, P.C., was retained by Carrier Corporation to perform an evaluation of the existing storm sewer system that discharges through permitted Outfalls 001, 002, 005, 006, 007, and 008. The scope of services included evaluation and review of existing outfall data, a reconnaissance of the storm sewer system and permitted outfalls, the development and implementation of a water and sediment sampling plan, and the preparation of a report summarizing the work and presenting conclusions and recommendations. The review of existing outfall data was presented in the SPDES Permitted Outfall Evaluation Report (Blasland & Bouck Engineers, P.C., December 1989) and is not included as a part of this report.

1.4 Report Organization

This report is organized into two sections as follows:

- Section 1 presents the purpose and scope of the report; and
- Section 2 presents a summary of the Blasland & Bouck Engineers, P.C., sewer reconnaissance and field sampling program.

Sewer Reconnaissance

SECTION 2 - SEWER RECONNAISSANCE

2.1 General

This section of the report presents a summary of data gathered during the sewer reconnaissance and sampling program conducted at the Carrier facility by Blasland & Bouck Engineers, P.C. The following information is included:

- o a listing of manholes and outfalls inspected;
- o completed inspection reports;
- o a listing of manholes and outfalls sampled;
- o completed sampling reports;
- o laboratory analytical results;
- o summaries of analytical results; and
- o a site plan detailing analytical results.

This section also describes the sewer reconnaissance and sampling procedures implemented during field activities.

2.2 Sewer Reconnaissance

The sewer reconnaissance program was conducted to develop a focused water and sediment sampling plan for the storm sewer system. The reconnaissance program was conducted between October 5 through 9, 1989, by Blasland & Bouck field technicians and consisted of locating and inspecting a total of 69 manholes and 6 outfalls within the Carrier storm sewer system. The manholes and outfalls inspected during the reconnaissance program are listed in Table 2-1 and are shown on the Carrier Corporation Site Plan included as Figure 2.

During manhole inspections, the following field information was noted:

- o manhole cover type and orientation with respect to surrounding grade;
- o manhole size and materials of construction;
- o manhole distinguishing characteristics (i.e., the presence of benchwalls, channels, roots, etc.);
- o orientation, size, and materials of construction of piping leading to and from the manhole;
- o general description of flow velocity (slow, average, or fast) and flow clarity (clear, average, or murky) in each pipe;
- o flow depth and sediment depth in each pipe;
- o manhole leakage; and
- o any additional miscellaneous information pertinent to the inspection (oil sheens, odors, etc.).

Manhole inspection report forms were completed for 46 of the 69 manhole locations inspected (see Table 2-1) but were not completed for 23 of the manholes inspected because observed flow characteristics at these locations showed low or no flow.

During outfall inspections, the following field information was noted:

- o outfall pipe size and materials of construction;
- o sediment depth in outfall pipe, if any; and
- o any other miscellaneous information pertinent to the inspection (the presence of permanent weirs, grating, debris, etc.).

All completed manhole and permitted outfall inspection report forms are presented in Appendix B.

2.3 Sampling Plan

Based on the information gathered from the sewer reconnaissance program, key manholes within the storm sewer system and the permitted outfalls were identified for water and sediment sampling. Table 2-2 presents a listing of these manhole and outfall sampling locations. Outfall 008 was not sampled because representative sediment and water samples could not be collected due to the presence of ponded water at the outfall discharge.

Water and sediment samples were collected during dry weather flow conditions and samples were analyzed for TCE and phenol by Upstate Laboratories, Inc. Sampling was conducted between October 16, 1989, and October 25, 1989. During sample collection, the following information was noted:

- water/sediment sample date and time;
- orientation of arterial pipe from which sample was collected with respect to the manhole effluent (i.e., 12:00, 3:00, 6:00, etc.); and
- size, depth of flow, and depth of silt.

End of pipe flow rates and sediment depths were noted for permitted outfall sample locations. Flow measurements were performed using a weir to obtain instantaneous flow reading. Completed field sampling reports are presented in Appendix C.

The results of all flow measurements and analyses are presented in Tables 2-3 through 2-7. A summary of field sampling results at the SPDES-permitted outfalls is presented in this section. The laboratory analytical reports are included as Appendix D.

SUMMARY OF FIELD SAMPLING AT THE SPDES OUTFALLS

	OUTFALLS					
	001	002	005	006	007	008
Flow (gpd)	19,700	111,500	1,666	12,225	46,760	--
TCE Concentration (ppb)						
Outfall Permit Limits	NL	10	NL	NL	10	NL
Outfall Water Sample Results		99			280	
TCE Mass Loading (lb/day)						
Outfall Permit Action Levels	0.045	NAL	0.005	0.005	NAL	0.002
Outfall Water Sample Results	0.005		<0.001	<0.001		--
Phenol Concentration (ppb)						
Outfall Permit Limits	5	10	50	5	15	6
Outfall Water Sample Results	<5	<5	<5	<5	<5	--

Notes:

1. Flow data is from Table 2-3.
2. TCE Concentration data is from Table 2-4.
3. TCE Mass Loading data is calculated from flow data in Table 2-3 and TCE Concentration data in Table 2-4.
4. Phenol Concentration data is from Table 2-6.
5. Outfall permit limits and action levels on Outfalls 001, 002, 005, 006, 007, and 008 are from SPDES Permit No. NY 0001163, effective August 1, 1989, and modified January 31, 1990.
6. "--" = not measured.
7. NL = No SPDES limits exist.
8. NAL = No SPDES action levels exist.

Tables

TABLE 1-1

CARRIER CORPORATION

SUMMARY OF TCE AND PHENOL CONCENTRATION LIMITS
MONTHLY MONITORING FOR SPDES COMPLIANCE

Outfalls	Concentration (ppb) TCE	Phenols
001	NL	5.0
002	10	10.0
005	NL	50.0
006	NL	5.0
007	10	15.0
008	NL	6.0

Notes:

1. All samples are to be collected on a grab basis each month.

2. Concentration limits for TCE and phenols are from SPDES Permit No. NY 0001163, effective August 1, 1989, and modified January 31, 1990. Outfalls 001, 005, 006, and 008 do not have concentration limits for TCE in this permit.

3. NL = No SPDES limits exist.

TABLE 1-2

CARRIER CORPORATION

SUMMARY OF TCE MASS LOADING ACTION LEVELS
QUARTERLY MONITORING FOR SPDES COMPLIANCE

Outfalls	Total Mass Loading (lb/day)
001	0.045
002	NAL
005	0.005
006	0.005
007	NAL
008	0.002

Notes:

1. All samples are to be collected on a grab basis each quarter.

2. Mass loading action levels for TCE are from SPDES Permit No. NY 0001163, effective August 1, 1989, and modified January 31, 1990. Outfalls 002 and 007 do not have mass loading action levels in this permit.

3. NAL = No SPDES action levels exist.

TABLE 2-1

CARRIER CORPORATION

SUMMARY OF MANHOLE/OUTFALL INSPECTION
SEWER RECONNAISSANCE PROGRAM

Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
the outfall	the outfall*	the outfall*	the outfall*	the outfall*	the outfall
154*	202A*	263*	006B*	42*	186
155*	202*	192*		39*	179*
156*	201*	191*		29*	177*
91*	203	193*		25*	71
90*	204	254		19*	14
89*	200	190*		113*	13
76*	196*	47*		109*	11*
116*	196B			109A*	8*
115*	196D				4
100	195				1*
99	194*				59*
98	147				
	218				
	151*				
	143*				
	142*				
	123*				
	125*				
	129*				
	122				
	130*				
	243				
	137*				
	138*				
	259				
	102*				
	256*				
	256A				
	256B				
	97				

Notes:

1. * indicates those manholes for which an inspection report was completed.

2. Manholes are listed starting at the outfall and then moving back through the storm sewer system.

TABLE 2-2

CARRIER CORPORATION

SUMMARY OF MANHOLE/OUTFALL SAMPLING LOCATIONS
FIELD SAMPLING PROGRAM

Water Sample Locations

Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
the outfall	the outfall	the outfall	the outfall	the outfall	186
156	202A	192	006B	42	177
89	202	190		29	11
116	196			19	1
	143			109	
	123				
	129				
	137				
	102				

Sediment Sample Locations

Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
89	the outfall	192	006B	the outfall	186
116	196	190		19	1
92	143				
	142				
	125				
	129				
	102				
	256				

Notes:

1. Manholes are listed starting at the outfall and then moving back through the storm sewer system.

TABLE 2-3

CARRIER CORPORATION

SUMMARY OF FLOWS
FIELD SAMPLING PROGRAM

Date	Flow (gpd) Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
1989						
October 16	---	111,500	---	---	---	---
October 25	19,700	---	1,666	12,225	46,760	---

Notes:

1. Flow measurements were performed by Blasland & Bouck Engineers, P.C.

2. Flows were measured during dry weather conditions by taking an instantaneous reading with a weir.

3. "---" not measured.

TABLE 2-4

CARRIER CORPORATION

SUMMARY OF TCE CONCENTRATIONS IN WATER
FIELD SAMPLING PROGRAM

	TCE Concentration (ppb)					
	Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
Outfall Permit Limits	NL	10	NL	NL	10	NL
Manhole Number						
Outfall	30	99	19	1	280	
156	54					
89	23					
116	14					
202A		46				
202		36				
196		560				
143		870				
123		27				
129		2				
137		3				
102		<1				
192			100			
190			21			
006B				6		
42					260	
29					150	
19					230	
109					240	
186						90
177						13
11						9
1						4

Notes:

1. Sampling was performed by Blasland & Bouck Engineers, P.C.
2. Analyses were performed by Upstate Laboratories, Inc.
3. All samples were collected on a grab basis during dry weather conditions.
4. All pipes were sampled from the 12:00 position except for as follows: 202A - 9:00; 109 - 6:00; 11 - 3:00.
5. Analytical detection limits for TCE in water is 1 ppb.
6. Concentration limits for TCE on Outfalls 002 and 007 are from SPDES Permit No. NY 0001163, effective August 1, 1989, and modified January 31, 1990. Outfalls 001, 005, 006, and 008 do not have concentration limits for TCE in this permit.
7. NL = No SPDES limits exist.

TABLE 2-5

CARRIER CORPORATION

SUMMARY OF TCE CONCENTRATIONS IN SEDIMENT
FIELD SAMPLING PROGRAM

Manhole Number	TCE Concentration (ppm) Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
Outfall		<0.036			<0.022	
89	<0.023					
116	<0.022					
92	<0.020					
196		0.024				
143		0.017				
142		<0.019				
125		<0.016				
129		<0.017				
102		<0.016				
256		<0.020				
192			1.2			
190			<0.022			
19					<0.022	
186						<0.022
1						<0.023

Notes:

1. Sampling was performed by Blasland & Bouck Engineers, P.C.
2. Analyses were performed by Upstate Laboratories, Inc.
3. All samples were collected on a grab basis during dry weather conditions.
4. All pipes were sampled from the 12:00 position.
5. Analytical detection limits for TCE in sediment is 0.10 ppm.

TABLE 2-6

CARRIER CORPORATION

SUMMARY OF PHENOL CONCENTRATIONS IN WATER
FIELD SAMPLING PROGRAM

	Phenol Concentration (ppb)					
	Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
Outfall Permit Limits	5	10	50	5	15	6
Manhole Number						
Outfall	<5	<5	<5	<5	<5	
156	<5					
89	<5					
116	<5					
202A		6				
202		<5				
196		<5				
143		<5				
123		<5				
129		<5				
137		<5				
102		<5				
192			<5			
190			5			
006B				<5		
42					16	
29					<5	
19					<5	
109					<5	
186						<5
177						<5
11						<5
1						<5

Notes:

1. Sampling was performed by Blasland & Bouck Engineers, P.C.
2. Analyses were performed by Upstate Laboratories, Inc.
3. All samples were collected on a grab basis during dry weather conditions.
4. All pipes were sampled from the 12:00 position except for as follows: 202A - 9:00; 109 - 6:00; 11 - 3:00.
5. Analytical detection limits for phenol in water is 5 ppb.
6. Concentration limits for phenol on Outfalls 001, 002, 005, 006, 007, and 008 are from SPDES Permit No. NY 0001163, effective August 1, 1989, and modified January 31, 1990.

TABLE 2-7

CARRIER CORPORATION

SUMMARY OF PHENOL CONCENTRATIONS IN SEDIMENT
FIELD SAMPLING PROGRAM

Manhole Number	Phenol Concentration (ppm)					
	Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007	Outfall 008
Outfall		1.0			0.6	
89	<0.5					
116	3.8					
92	<0.5					
196		<0.5				
143		3.5				
142		<0.5				
125		3.9				
129		0.7				
102		0.8				
256		1.5				
192			0.6			
190			0.9			
19					<0.5	
186						<0.5
1						<0.5

Notes:

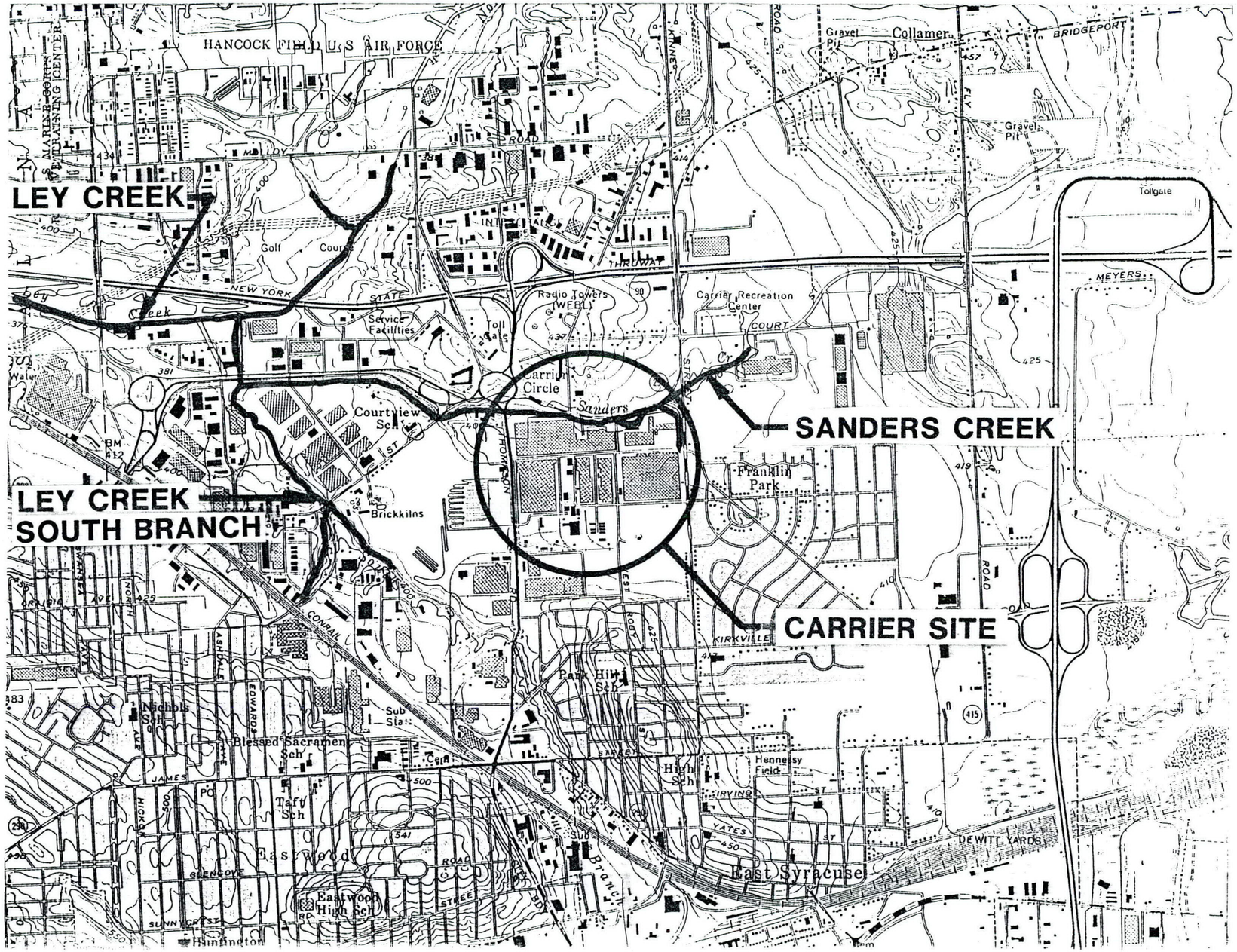
1. Sampling was performed by Blasland & Bouck Engineers, P.C.
2. Analyses were performed by Upstate Laboratories, Inc.
3. All samples were collected on a grab basis during dry weather conditions.
4. All pipes were sampled from the 12:00 position.
5. Analytical detection limits for phenol in sediment is 0.5 ppm.

Figures

FIGURE 1

SITE LOCATION MAP

FIGURE 1



SCALE

2000′ 1000′ 0 1000′ 2000′

CARRIER CORPORATION
SYRACUSE, NEW YORK

SITE LOCATION MAP

NOV. 1989
507.01.05

BASE MAP: U.S.G.S. ONONDAGA COUNTY, N.Y. QUADRANGLE

BLASLAND & BOUCK ENGINEERS, P.C.
ENGINEERS & GEOSCIENTISTS

FIGURE 2

CARRIER CORPORATION SITE PLAN

FIGURE 2

SANDERS CREEK

ROUTE 298

001 002 003 004 005 006 007 008 009

OUTFALL 001
WATER
TCE 30 ppb
P <5 ppb

OUTFALL 002
SEDIMENT	WATER
TCE 36 ppb	TCE 99 ppb
P 1 ppm	P <5 ppb

OUTFALL 005
WATER
TCE 19 ppb
P <5 ppb

OUTFALL 006
WATER
TCE 1 ppb
P <5 ppb

OUTFALL 007
SEDIMENT	WATER
TCE <22 ppb	TCE 280 ppb
P 6 ppm	P <5 ppb

MANHOLE 186
SEDIMENT	WATER
TCE <22 ppb	TCE 90 ppb
P <0.5 ppm	P <5 ppb

MANHOLE 192
SEDIMENT	WATER
TCE 1200 ppb	TCE 100 ppb
P 0.6 ppm	P <5 ppb

MANHOLE 190
SEDIMENT	WATER
TCE <22 ppb	TCE 21 ppb
P 0.9 ppm	P <5 ppb

MANHOLE 202A
WATER
TCE 46 ppb
P 6 ppb

MANHOLE 196
SEDIMENT	WATER
TCE 24 ppb	TCE 560 ppb
P <0.5 ppm	P <5 ppb

MANHOLE 006B
WATER
TCE 6 ppb
P <5 ppb

MANHOLE 177
WATER
TCE 13 ppb
P <5 ppb

MANHOLE 156
WATER
TCE 54 ppb
P <5 ppb

MANHOLE 202
WATER
TCE 36 ppb
P <5 ppb

MANHOLE 42
WATER
TCE 260 ppb
P 16 ppb

MANHOLE 11
WATER
TCE 9 ppb
P <5 ppb

MANHOLE 142
SEDIMENT
TCE <19 ppb
P <0.5 ppm

MANHOLE 29
WATER
TCE 150 ppb
P <5 ppb

MANHOLE 125
SEDIMENT
TCE <16 ppb
P 3.9 ppm

MANHOLE 123
WATER
TCE 27 ppb
P <5 ppb

MANHOLE 143
SEDIMENT	WATER
TCE 17 ppb	TCE 870 ppb
P 3.5 ppm	P <5 ppb

MANHOLE 89
SEDIMENT	WATER
<23 ppb	TCE 23 ppb
0.5 ppm	P <5 ppb

MANHOLE 1
SEDIMENT	WATER
TCE <23 ppb	TCE 4 ppb
P <0.5 ppm	P <5 ppb

MANHOLE 129
SEDIMENT	WATER
TCE <17 ppb	TCE 2 ppb
P 0.7 ppm	P <5 ppb

MANHOLE 116
SEDIMENT	WATER
TCE <22 ppb	TCE 14 ppb
P 3.8 ppm	P <5 ppb

MANHOLE 19
SEDIMENT	WATER
TCE <22 ppb	TCE 230 ppb
P <0.5 ppm	P <5 ppb

MANHOLE 137
WATER
TCE 3 ppb
P <5 ppb

MANHOLE 109
WATER
TCE 240 ppb
P <5 ppb

MANHOLE 92
SEDIMENT
TCE <20 ppb
P <0.5 ppm

MANHOLE 256
SEDIMENT
TCE <20 ppb
P 1.5 ppm

MANHOLE 102
SEDIMENT	WATER
TCE <16 ppb	TCE <1 ppb
P 0.8 ppm	TP <5 ppb

TR-1 TR-2 TR-3 TR-4 TR-5 TR-6 TR-7 TR-8 TR-9 TR-10 TR-11 TR-12 TR-13 TR-14 TR-18 TR-18S TR-19 TR-20 TR-21 TR-21A TR-22

THOMPSON ROAD

CARRIER PARKWAY

KINNE STREET

ADMINISTRATION

ENGINEERING

RESEARCH

PARKING

LEGEND

TCE	TRICHLOROETHYLENE
P	PHENOL
ppb	PARTS PER BILLION
ppm	PARTS PER MILLION
◡	OUTFALL INTO OPEN DITCH TO CREEK

CARRIER CORPORATION
SYRACUSE, NEW YORK

STORM SEWER SYSTEM
EVALUATION REPORT

SITE PLAN

BLASLAND & BOUCK ENGINEERS, P.C.
ENGINEERS & GEOSCIENTISTS

JLG
'0105R\50701G01