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Northern Terminal Group

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

Hillside Road, Cold Springs Terminals
Lysander, New York

February 21, 2018

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

Hillside Road, Cold Springs Terminals,
Lysander, New York

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Our Ref.:

B0090004.0006

Date:

February 21, 2018

CONTENTS

TABLES

FIGURES

ATTACHMENTS

Attachment 1. Monitoring Well Integrity Assessment Form

ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis U.S., Inc.
DER-10	Department of Environmental Remediation, Technical Guidance for Site Investigation and Remediation
fbgs	feet below ground surface
LIF	Laser Induced Florescence
LNAPL	light non-aqueous phase liquid
MNA	Monitored Natural Attenuation
NAPL	non-aqueous phase liquid
NYSDEC	New York State Department of Environmental Conservation
PACE	PACE Analytical Services, Inc., Greensburg, Pennsylvania
PID	photo-ionization detector
QAPP	Quality Assurance Project Plan
VOCs	volatile organic compounds
Work Plan	Groundwater and Soil Impact Investigation Work Plan
NYS DOH	New York State Department of Health
ELAP	Environmental Laboratory Accreditation Program
TCLP	toxicity characteristic leaching procedure

1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) has prepared this Supplemental Characterization and Interim Remedial Action Work Plan (Work Plan) for the Cold Springs Terminals Site (Figure 1), on behalf of the Northern Terminal Group, in accordance with the Order on Consent effective October 19, 2017. The Work Plan also accounts for the recent demolition activities on the Southern Terminals, including the removal of aboveground tanks and piping, which now allows for further assessment of the surface and subsurface conditions in previously inaccessible areas.

The specific objectives of the work scope detailed in this Work Plan are as follows:

- Evaluate soil in areas previously unassessed.
- Provide the additional data to allow for the refining and updating of the scope of the October 1, 2015 Cold Springs Terminal Mutual Defense Group Remedial Action Work Plan (October 2015 RAWP).
- Conduct a site assessment of the Northern Terminal

To accomplish these goals, this Work Plan proposes the following tasks across both the Northern and the Southern Terminals:

Northern Terminal:

- Perform a monitoring well integrity survey on existing wells that are being used as part of the proposed site investigation activities and make repairs as needed based on findings;
- Conduct a groundwater sampling event using the existing wells;
- Installation of additional groundwater monitoring wells as proposed below;
- Completing an elevation survey of new wells;
- Conduct a comprehensive groundwater sampling event on the Northern Terminal; and,
- Data compilation, interpretation, and presentation.

Southern Terminals:

- Collect soil quality data via Laser Induced Fluorescence (LIF);
- Advance soil borings to correlate LIF findings to direct laboratory analytical samples;
- After the STG re-establishment of the performance monitoring well network, commence groundwater sampling in accordance with the October 2015 RAWP; and,
- Data compilation, interpretation, and presentation.

A detailed description of these activities is provided below. The activities will be conducted in accordance with New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation-10 (DER-10, Technical Guidance for Site Investigation and Remediation) (NYSDEC, 2010a) and, in the case of the Southern Terminal area groundwater monitoring program, per the October 2015 RAWP (Cold Springs Terminal Mutual Defense Group, 2015).

2 NORTHERN TERMINAL INVESTIGATION ACTIVITIES

2.1 Monitoring Well Integrity Assessment

A group of 11 wells currently existing on the Northern Terminal will be useful in understanding the current groundwater conditions of the Northern Terminal. These wells are listed on Table 1 and are depicted on Figure 2.

The first field action will be a monitoring well integrity survey of all existing Northern Terminal wells. This will be performed to assess the need for monitoring well repair, development, or replacement. The integrity survey will include the following:

- The overall condition of the well (labeled; condition of the well protective casing or well head and well pad; integrity of the surface seals; presence of the bolting or locking well cap, J-plug inner lockable cap, inner well riser casing, and survey mark)
- The comparison of measurable quantities (e.g., riser stickup relative to grade and well total depth)
- An assessment of the bottom sediment condition via probe feel and or bailer inspection
- Confirmation that each well listed in Table 1 is part of a survey data set and has known survey coordinates and elevation
- An initial measurement of the depth to liquid in each well

A monitoring well integrity assessment form, provided as Attachment 1, will be completed for each of the existing monitoring wells in this group.

2.2 Northern Terminal Existing Wells Groundwater Gauging and Sampling Event

The Table 1-listed wells are existing wells that have been selected to assist in assessing groundwater conditions on the Northern Terminal. Following integrity inspection and any needed repairs these wells will be gauged with an interface probe. The depth to water and, if detected, non-aqueous phase liquid (NAPL) thickness will be recorded and reported. Monitoring wells that are part of the sampling program and are free of NAPL will be purged of three well volumes and subsequently sampled using disposable bailers. The groundwater quality in each well will be evaluated using a multi-parameter water quality meter for temperature (degrees Celsius), pH (Standard Units), conductivity (milli-Siemens per centimeter), DO (milligrams per liter), and ORP (milli-Volts) and will be recorded to evaluate Monitored Natural Attenuation (MNA) indicators on site.

Groundwater samples will be collected from each of the well locations in accordance with DER-10 guidelines. Samples will be analyzed for NYSDEC STARS-listed volatile organic compounds (VOCs) via EPA Method Number 8260 including oxygenates, and ethanol and for semi-volatile organic compounds (SVOC) via EPA Method 8270. In addition, collected samples will be analyzed for selected MNA indicators, including nitrate/nitrite, sulfate, dissolved methane, alkalinity, dissolved ferrous iron, dissolved manganese, and carbon dioxide. Chain-of-custody documentation will be maintained for all collected samples. Collected groundwater samples will be analyzed by PACE Analytical Services, Inc., in

Greensburg, Pennsylvania (PACE), a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program-certified (ELAP) laboratory.

One set of quality assurance/quality control samples, including a blind duplicate, matrix spike, matrix spike duplicate, and trip blanks, will be collected at a frequency of one per 20 and submitted for laboratory analysis. Purge water and any NAPL generated by the monitoring activities will be containerized in properly labeled steel 55-gallon drums for off-site disposal.

2.3 Northern Terminal Utility Mark Out

Prior to initiating subsurface disturbance activities, public utilities will be marked out by contacting Dig Safely New York to locate and mark all utilities near the areas of investigation. A private utility locator will also be contracted to provide additional utility mark out in the proposed areas of investigation. In accordance with Arcadis' subsurface clearance policy, unless variances are agreed to between various parties, each drilling location will also be hand cleared to a minimum of 5 feet below ground surface before drilling.

2.4 Northern Terminal Soil Boring and Soil Sampling Activities

Areas of the Northern Terminal will be assessed via a direct-push or hollow stem auger soil boring program followed by installation of groundwater monitoring wells, as discussed in Section 2.5 below. The locations for these proposed boring locations coincide with the proposed 11 groundwater monitoring wells proposed for the Northern Terminal, as discussed below and shown on Figure 3.

Soil borings will be advanced using direct-push or hollow stem auger sample collection methods (either macro core or split spoon methods). Soil samples will be continuously collected from grade to terminal depth using 2-inch-diameter sampling tools. Representative soils samples will be collected approximately every 2 feet and screened for VOCs using a properly calibrated photo-ionization detector (PID). Soil characteristics will be logged continuously by an Arcadis geologist for texture, grain size, moisture content, geologic description, and the potential presence of impacts as detected via field PID instrumentation. Each boring termination depth will be determined in the field by the on-site geologist and will be based on the field indication of absence of impacts or 10 feet below the first detection of the water table, whichever is shallower. For the purposes of this investigation, field determination of absence of impact will be a detection of 50 parts per million (PPM) on a field PID or less. Based on a review of historical data, the anticipated terminal depth of each boring is estimated to be less than 25 feet.

Soil samples will be collected, at a minimum, from the interval with the highest PID reading above the water table and at the water table. Additionally, depending on field conditions and observations, samples may also be collected from additional intervals at each boring. All retained samples will be analyzed by PACE for constituents listed in NYSDEC Policy CP-51: Tables 2 and 3 (Soil Cleanup Levels for Gasoline and Fuel Oil Contaminated Soils, respectively) (NYSDEC, 2010b). Samples will also be analyzed for oxygenates and ethanol. Additionally, samples from the ground surface to 2 feet below ground surface will be analyzed for total lead.

Soil cuttings generated during soil sampling activities will be temporarily contained on and covered with plastic sheeting. Composite samples of the material will be collected for characterization analysis in

accordance with applicable laws and regulations. All materials will be disposed of at an off-site location based on the results of laboratory analytical testing.

2.5 Northern Terminal Monitoring Well Installation

As discussed above, additional groundwater monitoring wells are proposed for the Northern Terminal. There are 11 monitoring wells proposed throughout the Northern Terminal study area at the locations shown on Figure 3 and coincide with the locations for the soil borings discussed in Section 2.4 above. The soil borings for each of the monitoring wells will be advanced using a hollow stem auger rotary method. Wells will be constructed using 2-inch inside-diameter, Schedule 40, polyvinyl chloride (PVC) material. Monitoring wells will be constructed with a 15-foot screen intended to straddle the water table (i.e., 10 feet below the estimated average water table elevation and 5 feet above the estimated average water table elevation).

2.6 Northern Terminal Comprehensive Groundwater Sampling Event

Once the Northern Terminal monitoring wells have been installed and developed, they will be surveyed for horizontal coordinate and vertical (elevation) control. These newly installed 11 wells, along with the wells listed in Table 1, will be gauged with an interface probe and sampled in accordance with Section 2.2 above. It is estimated that the comprehensive northern terminal sampling event will take place approximately one quarter after the initial northern terminal sampling event.

Once a minimum of two and a maximum of four events of quarterly groundwater sampling have been completed, the data set will be evaluated. This evaluation will be used to generate a groundwater monitoring program for the Northern Terminal, as Northern Terminal groundwater monitoring was not contemplated in the October 2015 RAWP document. Following this initial set of up to four comprehensive groundwater data collection events and data evaluation, an updated and revised groundwater monitoring program will be proposed to NYSDEC for their review and consideration. This updated program will include a revised list of monitoring wells and analytical parameters for future proposed monitoring.

2.7 Northern Terminal Reporting

A report of findings summarizing the initial groundwater sampling event of the existing wells, the soil data collection, and the first comprehensive groundwater sampling event will be issued. This report will contain all relevant data noted above along with supporting attachments such as boring logs, well construction details, liquid level data, laboratory analytical reports. Additionally, data collected at the site in 2016 will be presented in this report of findings.

3 SOUTHERN TERMINALS INVESTIGATION ACTIVITIES

3.1 Southern Terminal Utility Mark Out

Prior to initiating subsurface disturbance activities, public utilities will be marked out by contacting Dig Safely New York to locate and mark all utilities near the areas of investigation. A private utility locator will also be contracted to provide additional utility mark out in the proposed areas of investigation. In accordance with Arcadis' subsurface clearance policy, unless variances are agreed to between various parties, each drilling location will also be hand cleared to a minimum of 5 feet below ground surface before drilling.

3.2 Southern Terminal Data Gap Area Assessment

This Work Plan proposes installing direct push soil penetrations across the Southern Terminals where data gaps exist. These borings will be conducted via LIF-type technology akin to the impact assessment work completed by AECOM in 2013 at the site. This data will allow for a three-dimensional understanding of the locations, and relative magnitude, of impacts across the data gap areas. The proposed locations of the LIF points are shown on Figure 5. Based on input and comments from NYSDEC, proposed LIF location #8 has been adjusted to line up with the former oil water separator structure that the NYSDEC removed from site during December 2017 – January 2018.

3.3 Soil Boring and Sampling Activities

Following collection and interpretation of the LIF data a brief summary memo will be prepared that would include a proposal for confirmation sampling. The LIF locations would be confirmed by approximately five (5) borings via traditional direct push or hollow stem auger advanced locations and collection of soil samples. This would allow for a calibration from the relative impact mapping provided by the LIF technology and actual compound-specific detections relative to Standards, Criteria, or Guidance values per NYSDEC Guidance Document CP-51. The final soil boring correlation sampling frequency determination will be made based on the results of the LIF data in conjunction with input from the NYSDEC.

Soil samples will be collected, at a minimum, from the interval with the highest PID reading above the water table and at the water table. Additionally, depending on field conditions and observations, samples may also be collected from additional intervals at each boring. All collected samples will be analyzed by PACE for constituents listed in NYSDEC Policy CP-51: Tables 2 and 3 (Soil Cleanup Levels for Gasoline and Fuel Oil Contaminated Soils, respectively) (NYSDEC, 2010b). Samples will also be analyzed for oxygenates and ethanol. Additionally, samples from the ground surface to 2 feet below ground surface will be analyzed for total lead.

In addition to the confirmatory boring set proposed here, four additional soil borings will be executed at the request of the NYSDEC as follows (Figure 5):

A boring will be added east of the small building located on the South East terminal (Figure 5) to characterize the impacts observed by the NYSDEC in this area during their removal of a 500-gallon consumptive use underground heating oil tank. The removal of the tank was conducted in

January 2018. Data collected from this boring will be analyzed via the same methods as all confirmatory borings being proposed.

Three shallow soil borings will be installed in the pipeline right of way located between the eastern and western southern terminals to collect shallow TCLP lead soil data quality. The most northerly of these samples will have two samples collected as follows: 0-2 feet below ground surface (fbgs) and 2-4 fbgs. The remaining two locations will have only the 0-2 fbgs sample collected.

A NYS licensed surveyor will be used to locate the LIF points as well as the soil borings installed on the southern terminal.

The results of the follow up, confirmation soil sampling plan may also suggest the installation of additional groundwater monitoring wells. Furthermore, the extended characterization of these areas should also support reevaluating the existing system design and layout especially with respect to the recent and substantial changes to the site access caused by the removal of the historic terminal above-ground infrastructure.

3.4 Southern Terminal Monitoring Well Network

Of the historic wells previously installed across the Cold Springs Terminals Site, 29 were listed in the October 2015 RAWP as wells required for system performance monitoring by the Southern Terminals Group (STG). This group of wells is listed on Table 2 and shown on Figure 4. 22 of these wells were located on the Southern Terminal properties and, as a result of recent demolition activities, have likely been compromised or lost. The remaining 7 wells are also of unknown condition. As such, baseline sampling and subsequent groundwater monitoring, as outlined in the October 2015 RAWP, will be conducted once the STG has re-established the system performance well monitoring network.

3.5 Southern Terminal Reporting

All the results of the activities described in this Work Plan will be presented in two reports as follows:

The first deliverable will be a memo summary of the LIF findings and will include a proposal for the confirmatory sampling program.

The second and final report will summarize LIF soil confirmation sampling activities. The report is anticipated to include, at a minimum, the following:

- A brief narrative describing the field activities, observations, and results
- An updated Site Plan showing the actual locations of all new surveyed soil borings
- Soil boring logs
- Copies of laboratory testing reports

4 REFERENCES

Cold Springs Terminal Mutual Defense Group. 2015. Remedial Action Work Plan. October 1, 2015.

New York State Department of Environmental Conservation (NYSDEC). 2010a. Department of Environmental Remediation-10 (DER-10), Technical Guidance for Site Investigation and Remediation. May 2010.

NYSDEC. 2010b. Guidance Document CP-51. October 21, 2010.

TABLES

Table 1
Northern Terminal Area Monitoring Wells

Cold Springs Terminals
Hillside Road
Lysander, New York

Well ID	Diameter (inches)	DTB (ft bgs)	TOS (ft bgs)
BMW1	2	15.0	5.3
BMW2	2	34.8	15.3
BMW3	2	29.7	3.5
BMW5	2	30.0	10.0
BMW6	2	30.0	10.0
BMW7	2	15.0	5.0
BMW8	2	20.0	5.0
BMW9	2	15.0	5.0
BMW13	2	UK	UK
BWM14	2	UK	UK
PZ106S	2	15.5	5.5

Notes:
DTB = depth to bottom
ft bgs = feet below ground surface TOS = top of screen
UK = Unknown

Table 2
Sitewide Remedial Performance Monitoring Wells

Cold Springs Terminals
Hillside Road
Lysander, New York

Well ID*	Diameter (inches)	DTB (ft bgs)	TOS (ft bgs)
A1	2	12	7
A4	2	23	8
A6	2	12	7
A10	2	14	4
A13	4	19	4
A16	4	19	4
A20	4	15	5
A21	2	14	4
A23	2	12	7
A25	2	14	4
B4	4	24.5	9.5
B9	2	22	12
B15	2	17	7
BMW3	2	29.7	3.5
BMW4	2	12.5	2.75
BMW9	2	15	5
HD4A	2	12	2
S2	4	20	5
S4	4	20	5
S5	4	15.5	5.5
S10	4	19	4
S12	2	18	3
S13	4	20	5
S15	4	19	4
S21	2	18.5	3.5
S22	2	8	3
S23	2	8	3
S24	2	8	3
SMW3	2	15	5

Notes:
DTB = depth to bottom
ft bgs = feet below ground surface TOS = top of screen
*These monitoring wells are part of the monitoring program, per the October 2015 RAWP.

FIGURES

LEGEND:

- MONITORING WELL
- PIEZOMETER
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

SITE LAYOUT AND HISTORICALLY EXISTING MONITORING WELLS

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FIGURE 1

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
C:\Users\roberlander\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Comany\2018\B0090004.0005\01-DWG\WP-Fig1-Site Layout.dwg LAYOUT: 1 SAVED: 1/3/2018 11:02 AM ACADVER: 20.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/4/2018 1:34 PM BY: OBERLANDER, ROSEANNE
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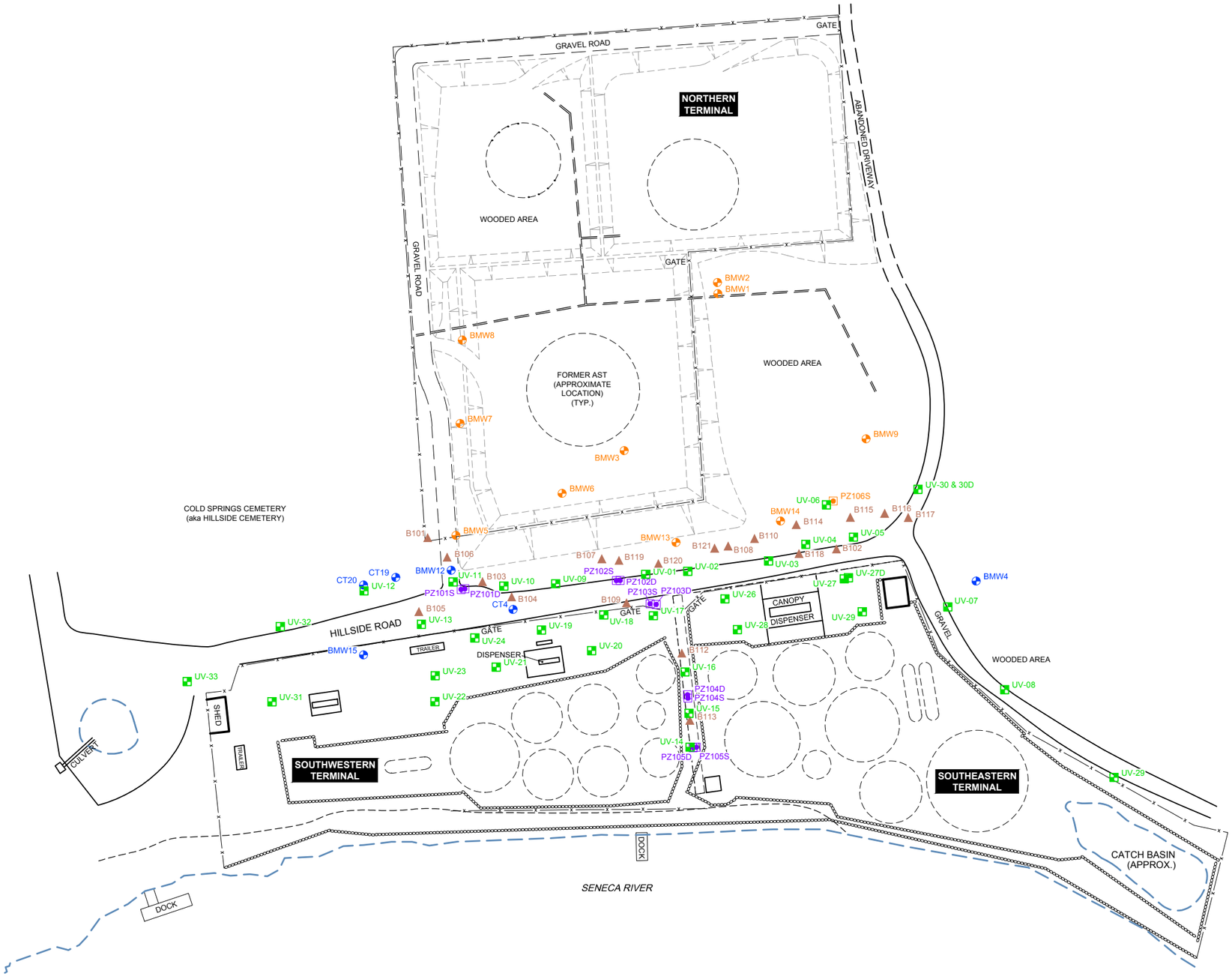

LEGEND:

- MONITORING WELL
- NORTHERN TERMINAL EXISTING MONITORING LOCATIONS
- PIEZOMETER
- UVOST/CPT
- SOIL BORING
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

NORTHERN TERMINAL EXISTING MONITORING WELLS

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FIGURE 2

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(On)ON=*;OFF=*REF*
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X-Base Map
PROJECTNAME: ----

LEGEND:

- PROPOSED MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- UVOST/CPT
- SOIL BORING
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

PROPOSED NORTHERN AREA ADDITIONAL WELLS

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FIGURE 3

CITY: SYRACUSE NY DIV/GROUP: ENV/CAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(On)ON=*;OFF=*REF*
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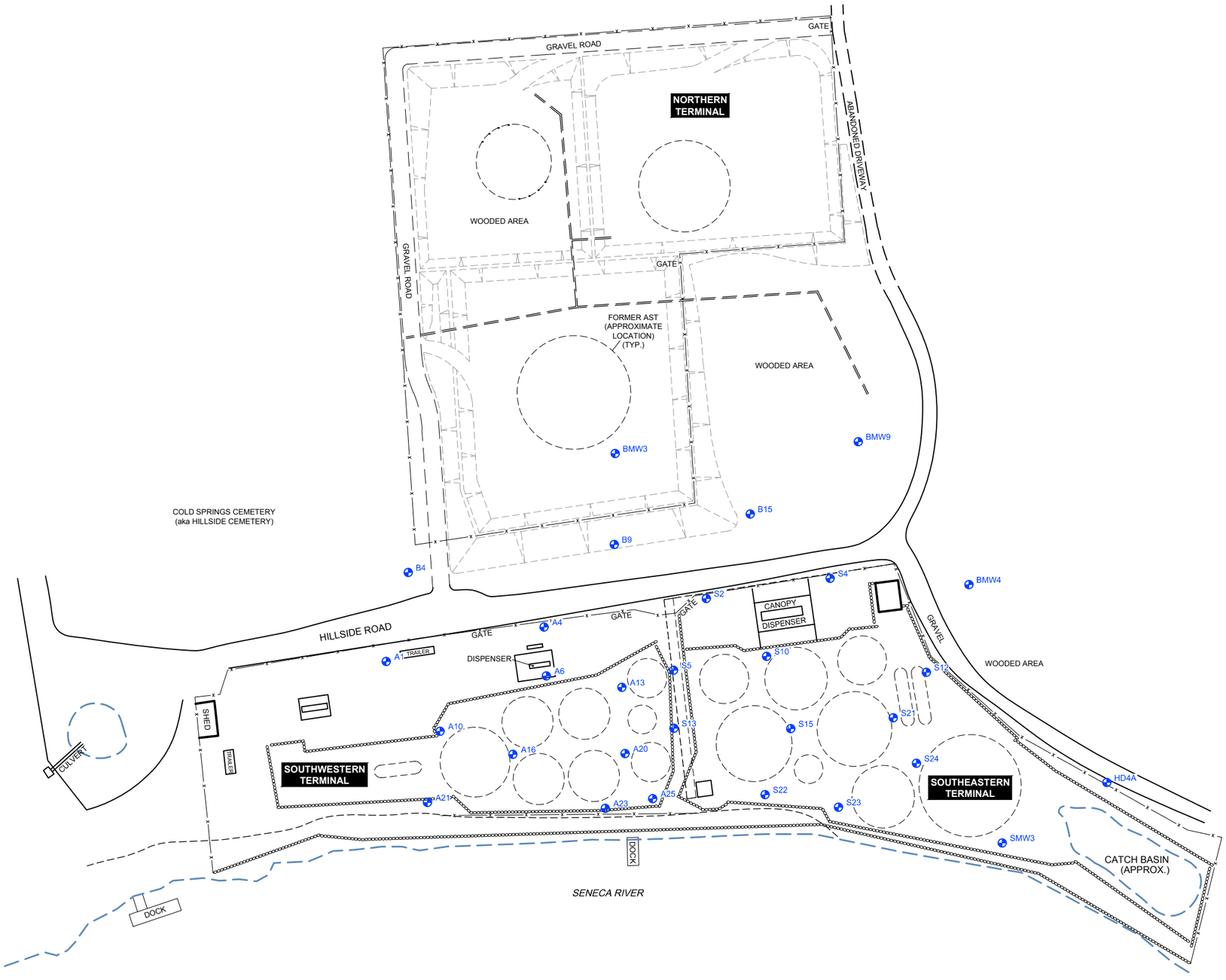
X-WP-Title Block
X-Base Map



LEGEND:

- REMEDIATION MONITORING WELL
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTE:

1. BASE MAP REFERENCE: "SITE MAP SYSTEM PERFORMANCE WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

REMEDIAL PERFORMANCE MONITORING WELLS (PER OCTOBER 2015 RAWP)

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FIGURE 4

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
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X-Base Map

LEGEND:

- PROPOSED MONITORING WELL
- PROPOSED LASER INDUCED FLUORESCENT (LIF) LOCATION
- MONITORING WELL
- PIEZOMETER
- UVOST/CPT
- SOIL BORING
- PROPOSED SOIL BORING
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED 9-30-2015.
2. LOCATION OF SOIL BORINGS (B101-B110 AND B112-B118) AND PIEZOMETERS (PZ101-PZ106) WERE SURVEYED ON APRIL 26, 2016 AND SOIL BORINGS (B119-B121) WERE SURVEYED ON AUGUST 29, 2016 BY C.T. MALE.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

HILLSIDE ROAD, COLD SPRINGS TERMINALS
LYSANDER, NEW YORK

SUPPLEMENTAL CHARACTERIZATION AND INTERIM REMEDIAL ACTION WORK PLAN

PROPOSED MONITORING WELL, SOIL BORING, AND LIF LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY: SYRACUSE NY DIV/GROUP: ENV/CAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
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X-Base Map

ATTACHMENT 1

Monitoring Well Integrity Assessment Form

ARCADIS

Monitoring Well Integrity Assessment Form

(For each item, check appropriate response or fill in the blank)

Date _____

Well ID _____ ID Clearly Marked? _____ Project Name _____

Photo filename _____ Project Number _____

Weather _____ Field Personnel _____

General Description of Surroundings _____

Well Condition:

Damaged? ☐ Abandoned? ☐
(Describe Below)

Stick Up ☐ Flush Mount ☐

Lockable cover? _____

Lock present? _____

Key number: _____

Stick up height _____

Casing material _____

Well diameter _____

Protective casing material: _____

Protective casing diameter: _____

Cap present? Type? _____

Vented? If so, how? _____

Measuring point clearly marked? _____

Total depth reported: _____

Total depth measured: _____

DTW: _____

Well obstructed? If so, depth? _____

Well bottom soft (sediment) or firm? _____

Flush Mount Wells Only

Gasket present? _____

Bolts present? _____

Teflon washers present?

Surface Condition:

Damaged? ☐
(Describe Below)

Pad/cement intact? _____

Curb box/well cover present? _____

Intact? _____

Seal condition _____

All bolts present? _____

Ground surface slopes away from well? _____

Location Sketch

Comments/Recommendations:

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Tel 315 446 9120

Fax 315 449 0017

www.arcadis.com