TETRA TECH

February 19, 2013

Mr. Todd Davis
Site Assessment Manager
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Subject: Quality Assurance Project Plan for a Phase II Targeted Brownfields Assessment
Kuhlman Diecasting Site, Stanley, Kansas
U.S. EPA Region 7, START 3, Contract No. EP-S7-06-01, Task Order No. 0002.015.024
Task Monitor: Todd Davis, Site Assessment Manager

Dear Mr. Davis:

Tetra Tech, Inc. is submitting the attached Quality Assurance Project Plan for a Phase II Targeted Brownfields Assessment at the Kuhlman Diecasting site in Stanley, Kansas. If you have any questions or comments, please contact the project manager at (913) 412-1937.

Sincerely,

Jeff Pritchard, CHMM
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Roy Crossland, START Project Officer (cover letter only)

415 Oak Street, Kansas City, MO 64106
Tel 816.412.1741 Fax 816.410.1748 www.tetratech.com

QUALITY ASSURANCE PROJECT PLAN
PHASE II TARGETED BROWNFIELDS ASSESSMENT
KUHLMAN DIECASTING SITE
STANLEY, KANSAS

Superfund Technical Assessment and Response Team (START) 3 Contract
Contract No. EP-S7-06-01, Task Order 0002.015.024

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
11201 Renner Boulevard
Lenexa, Kansas 66219

February 19, 2013

Prepared By:

Tetra Tech, Inc.
415 Oak Street
Kansas City, Missouri 64106
(816) 412-1741

CONTENTS

APPENDICES

Region 7 Superfund Program
Addendum for the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the Kuhlman Diecasting Site

Project Information:

Site Name: Kuhlman Diecasting Site			**City:** Stanley	**State:** Kansas
EPA Project Manager: Todd Davis			**START Project Manager:** Jeff Pritchard	
Approved By:		2-19-13	**Prepared For:** EPA Region 7 Superfund Division	
Title:	START Project Manager	Date:		
Approved By:				
Title:	START Program Manager	Date: 2-19-13		
Approved By:			**Prepared By:** Kirk Mammoliti	
Title:	START QA Manager	Date: 2-19-13	**Date:** February 2013	
Approved By:				
Title:	EPA Project Manager	Date:	**Tetra Tech START Project Number:** X9004.06.0002.015.024	
Approved By:				
Title:	EPA Region 7 QA Manager	Date:		

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: Todd Davis, Site Assessment Manager
Diane Harris, Region 7 QA Manager

START: Jeff Pritchard, Project Manager

1.2 Project/Task Organization

Todd Davis, of the EPA Region 7 Superfund Division, will serve as the EPA Project Manager for the activities described in this QAPP. Jeff Pritchard, of Seagull Environmental Technologies, Inc., a subcontractor to Tetra Tech Inc., (Tetra Tech), will serve as the START Project Manager for field activities.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012), and contains site-specific data quality objectives for the sampling activities described herein.

☒ Description attached.

☐ Description in referenced report: _____ (Title) _____ (Date)

1.4 Project/Task Description:

☐ CERCLA PA ☐ CERCLA SI ☒ Brownfields Assessment
☐ Other (description attached): ☐ Pre-CERCLIS Site Screening ☐ Removal Assessment

Schedule: Field work is anticipated to occur in March 2013.

☐ Description in referenced report: _____ (Title) _____ (Date)

1.5 Quality Objectives and Criteria for Measurement Data:

Accuracy:	☒ Identified in attached table.
Precision:	☒ Identified in attached table.
Representativeness:	☒ Identified in attached table.
Completeness*:	☒ Identified in attached table.
Comparability:	☒ Identified in attached table.

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

☒ OSHA 1910
☒ Special Equipment/Instrument Operator:
☐ Other (describe below):

Sampling personnel will be experienced in Geoprobe® operation and in collection of soil and groundwater samples. Geoprobe® operation will proceed under the supervision of a licensed Kansas Well Driller.

Region 7 Superfund Program
Addendum for the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the Kuhlman Diecasting Site

1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☐ Trip Report ☒ Site Maps ☐ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

☒ Sample documentation will follow EPA Region 7 SOP 2420.05.

☒ Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☐ Screening w/ Definitive Confirmation
☒ Sample Map Attached

The proposed sampling scheme for this project will incorporate a combination of biased/judgmental sampling with definitive laboratory analysis, in accordance with procedures included in the *Guidance for Performing Site Inspections Under CERCLA*, OSWER Directive #9345.1-05, September 1992. All samples will be submitted for analysis to an off-site laboratory subcontracted by START. See Appendices A and B for additional site-specific information and maps. The proposed number of samples is a balance between cost and coverage, and represents a reasonable attempt to meet the study objectives while staying within the budget constraints of a typical site investigation.

Sample Summary Location	Matrix	# of Samples*	Analysis
On-site Geoprobe® locations	Subsurface Soil	12	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)
On-site Geoprobe® temporary wells	Groundwater	12	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)
On-site permanent monitoring wells	Groundwater	6	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)
Site building	Building Materials/Concrete Chips	10	Cyanide and TCLP RCRA Metals

*NOTE: Background/QC samples are not included with these totals. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s)/Methods
Soil	Subsurface soil samples will be collected with a Geoprobe® direct-push apparatus, using Macro-Core samplers fitted with polyvinyl chloride (PVC) liners, and transferred to the appropriate sample containers.	SOPs 4230.07 & 4231.2012; Method 5035
Groundwater	At the permanent and temporary Geoprobe® wells, groundwater samples will be collected using a peristaltic pump through disposable polyethylene tubing. At the permanent monitoring wells, groundwater samples will be collected after the monitoring wells have been purged using low-flow techniques and field water quality parameters have stabilized. At the temporary Geoprobe® wells, sampling equipment will include a Screen Point 15 sampling apparatus containing a disposable PVC screen.	SOPs 4230.07 & 4231.2007
Building Materials/Concrete Chips	Chip samples will be collected from the concrete floor inside of the site building using hand tools and/or a concrete core drill.	SOP 4231.2011

2.3 Sample Handling and Custody Requirements:

☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06.
☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04.
☐ Samples will be accepted according to Region 7 EPA SOP 2420.01.

☒ Other (Describe): Samples submitted to a START-contracted laboratory will be accepted in accordance with procedures established by the laboratory

2.4 Analytical Methods Requirements:

☒ Identified in attached table.
☒ Rationale: The requested analyses have been selected based on the historical information on the site and program experience with similar types of sites.
☐ Other (Describe):

Region 7 Superfund Program
Addendum for the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the Kuhlman Diecasting Site

2.5 Quality Control Requirements:

☐ Not Applicable
☒ Identified in attached table.
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Describe Field QC Samples: For this investigation, field QC samples will include one equipment rinsate blank (water), one water trip blank, and one water field blank. The equipment rinsate will evaluate the effectiveness of decontamination procedures for Geoprobe® sampling equipment. The trip blank will be used to assess transportation-related contamination. The field blank will be collected to evaluate contamination of sampling containers and/or preservatives, and to assess contamination potentially introduced during sampling and laboratory procedure(s). The blank samples will be submitted for the analyses listed in the attached tables. Evaluation of the blank samples depends on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results of the blank samples will be evaluated on a qualitative basis by the EPA project manager and EPA contractor(s) to determine a general indication of field-introduced and/or lab-introduced contamination. Because evaluation for total method precision is not necessary for this project, no field duplicates will be collected.

☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Other (Describe): Testing, inspection, and maintenance of field instruments (photoionization detector and water quality meter) will accord with manufacturers' recommendations. Testing, inspection, and maintenance of analytical instrumentation will accord with the previously referenced SOPs and/or manufacturers' recommendations.

2.7 Instrument Calibration and Frequency:

☐ Not Applicable
☒ Inspection/acceptance requirements accord with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Calibration of laboratory equipment will occur as described in the previously referenced SOPs and/or manufacturers' recommendations.
☒ Other (Describe): Calibration of field instruments (water quality meter) will occur daily, as described in the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers.*
☐ Other (Describe):

2.9 Data Acquisition Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Previous data/information pertaining to the site (including other analytical data, reports, photos, maps, etc., which are referenced in this QAPP) have been compiled by EPA and/or its contractor(s) from other sources. Some of that data has not been verified by EPA and/or its contractor(s); however, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data/information.
☐ Other (Describe):

2.10 Data Management:

☐ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01.
☒ Other (Describe): Laboratory data acquired by the START-contracted laboratory will be managed in accordance with procedures established by the laboratory.

Region 7 Superfund Program
Addendum for the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the Kuhlman Diecasting Site

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit

☒ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.06 and 2430.12.

☐ Other (Describe):

3.1A Corrective Action:

☒ Corrective actions will be taken at the discretion of the EPA Project Manager whenever there appear to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.

☐ Other (Describe):

3.2 Reports to Management:

☐ Audit Report ☒ Data Validation Report ☐ Project Status Report ☐ None Required

☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by Tetra Tech START and submitted to the EPA.
☒ Reports will be prepared in accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

☐ Identified in attached table.
☒ Data review and verification will be performed in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
☐ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.06, 2430.12, and 2410.10.
☒ Other (Describe): The analytical data package will be validated internally by the contracted laboratory in accordance with the laboratory's established SOPs. A Tetra Tech chemist will conduct an external verification and validation of the laboratory data package using a method consistent with a Stage 2B validation, as described in the EPA Contract Laboratory Program (CLP) Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA 2009). A Stage 2B validation includes verification and validation based on completeness and a compliance check of sample receipt conditions and sample-related and instrument-related QC results. The EPA Project Manager will be responsible for overall validation and final approval of the data, in accordance with the projected use of the results.

4.2 Validation and Verification Methods:

☐ Identified in attached table.
☐ The data will be validated in accordance with Region 7 EPA SOPs 2430.06, 2430.12, and 2410.10.
☒ The EPA project manager will inspect the data to provide a final review. The EPA project manager will review the data, if applicable, for laboratory spikes and duplicates, laboratory blanks, and field QC samples to ensure the data are acceptable. The EPA project manager will also compare the sample descriptions with the field sheets for consistency, and will ensure appropriate documentation of any anomalies in the data.
☒ Other (Describe): If any problems with field measurements or analytical data are identified by Tetra Tech's data verification/validation, the START Project Manager will verbally, and in writing if requested by EPA, explain the circumstances of the failure, describe any corrective action taken, and provide an opinion on the limitations and usefulness of the data to the EPA Project Manager.

4.3 Reconciliation with User Requirements:

☐ Identified in attached table:
☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded, and re-sampling or re-analysis of the subject samples may be required by the EPA Project Manager.

☐ Other (Describe):

Region 7 Superfund Program
Addendum for the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the Kuhlman Diecasting Site

Table 1: Sample Summary

Site Name: Kuhlman Diecasting | **Location:** Stanley, Kansas

START Project Manager: Jeff Pritchard | **Activity/ASR #:** To be determined | **Date:** February 2013

No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Method	Analytical Method/SOP
12	Subsurface Soil	On-site Geoprobe® locations	To assess potential soil contamination from historical site operations	2-foot interval (between 0 and 20 feet below ground surface) based on field screening results	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)	SOPs 4230.07 & 4231.2012; Method 5035	EPA Method 8260; Methods OA-1 & OA-2
12	Groundwater	On-site Geoprobe® temporary wells	To assess potential groundwater contamination from historical site operations	Directly below the water table	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)	EPA SOPs 4230.07 & 4231.2007	EPA Method 8260; Methods OA-1 & OA-2
6	Groundwater	On-site permanent monitoring wells (3 existing, 3 new)	To determine current contaminant concentrations in groundwater	Screened intervals To be determined	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)	EPA SOP 4231.2007	EPA Method 8260; Methods OA-1 & OA-2
10	Building Material/Concrete Chips	Site building	To assess potential contamination of structural surfaces, and to evaluate disposal options	NA	Cyanide and TCLP RCRA metals (including mercury)	EPA SOP 4231.2011	EPA Methods 9013, 1311, 6010 & 7470
QC Samples							
1	Water	Trip blank	To assess transportation-related contamination	NA	VOCs	NA	EPA Method 8260
1	Water	Field blank	To assess field-introduced and laboratory-introduced contamination	NA	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)	NA	EPA Method 8260; Methods OA-1 & OA-2
1	Water	Rinsate blank	To evaluate effectiveness of decontamination procedures for sampling equipment	Through Geoprobe® sampling equipment	VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)	NA	EPA Method 8260; Methods OA-1 & OA-2

Region 7 Superfund Program
Addendum for the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the Kuhlman Diecasting Site

Table 2: Data Quality Objective Summary

Site Name: Kuhlman Diecasting	**Location:** Stanley, Kansas	
START Project Manager: Jeff Pritchard	**Activity/ASR #:** To be determined	**Date:** February 2013

Analysis	Analytical Method	Data Quality Measurements					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representativeness	Completeness	Comparability		
SOIL								
VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgment of the sampling team	100%; no critical samples have been identified	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
GROUNDWATER								
VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2)	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgment of the sampling team	100%; no critical samples have been identified	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
STRUCTURAL MATERIALS/CONCRETE CHIPS								
Cyanide and TCLP RCRA metals (including mercury)	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgment of the sampling team	100%; no critical samples have been identified	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.

APPENDIX A

SITE-SPECIFIC INFORMATION FOR A PHASE II TBA AT THE KUHLMAN DIECASTING SITE

INTRODUCTION

The Tetra Tech Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct a Phase II Targeted Brownfields Assessment (TBA) (consistent with a Phase II Environmental Site Assessment [ESA]) of the Kuhlman Diecasting site in Stanley, Kansas. The Kuhlman Diecasting site has a well-documented environmental history associated with its past operation as an electroplating facility and petroleum/oil refinery. Numerous environmental investigations at the site have identified elevated levels of site-related contaminants in environmental media. The most recent investigation (also identified as a Phase II TBA) identified a plume of volatile organic compounds (VOC) in groundwater and petroleum-related contamination in soil at the site. The purpose of this Phase II TBA is to further investigate the nature and extent of that contamination. Additionally, this Phase II TBA will involve characterization of site building materials for demolition and disposal purposes. This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for this investigation.

SITE LOCATION/DESCRIPTION

The Kuhlman Diecasting site, hereafter referred to as the "site" or "subject property," is a defunct electroplating facility that covers approximately 35.15 acres and is bounded west and south by the Blue River. The site address is 16400 Mission Road, which is near 164th Street and Mission Road in Stanley, Kansas. The site is accessed off Mission Road by a gravel road that connects to West 163rd Street. The site is included on the Stilwell, Kansas, U.S. Geological Survey (USGS) 7.5-minute topographic series map (USGS 1991) (see Appendix B, Figure 1). The site is in Section 16, Township 14 South, Range 25 West. The coordinates of the approximate center of the site are 38.830741 degrees north latitude and 94.633464 degrees west longitude.

The property is currently owned by the Kuhlman Diecasting Company; however, it is not currently used for any beneficial purpose. On the site is a single-story, concrete block building encompassing 73,730 square feet (ft^2). In addition, the site includes two process water storage basins, two wastewater evaporation sanitary lagoons, three capped lagoons (surface impoundments), and a pond (see Appendix B, Figure 2). The site is surrounded by a levee that was constructed to provide flood control. Additionally, a railroad line bisects the site in a north-south direction.

Operations on the subject property have included bulk oil storage/transfer, grain storage, and electroplating. Property information from the Johnson County Assessor's website indicates the site

building was constructed in 1904 (Environment International Government Ltd. [EIGov] 2011). Historical photographs show seven, large, aboveground storage tanks (AST) present at the site dating back to 1941. Kuhlman began electroplating operations at the site in 1962. Kuhlman manufactured zinc diecastings for a variety of commercial and industrial customers. Kuhlman operations consisted of an electroplating process that used chromium, nickel, and copper plating on zinc diecastings. On November 30, 1990, Kuhlman ceased all operations and filed for bankruptcy.

PREVIOUS INVESTIGATIONS

The site has a well-documented environmental history associated with Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigations and cleanups. Numerous investigations at the site have involved collection of multimedia samples to determine if past site operations had resulted in releases of hazardous substances. Involved in those investigations and cleanups were samplings of soil (surface and subsurface), groundwater, surface water, and sediment. In addition, air, dust, and concrete samples were collected from within the building.

Because the site's environmental history is well documented, a complete discussion of past investigations at the site is not included in this QAPP. However, listed below are several site reports completed for EPA that summarize site history and results of previous environmental investigations and cleanups.

- Jacobs Engineering. 1988. RCRA Facility Assessment of Kuhlman Diecasting Site. Stanley, Kansas. EPA ID No. KSD006325013. July.
- Ecology and Environment, Inc. 1992. Removal Funded: Kuhlman Diecasting Co., Stanley, Kansas. Removal Assessment Phase II. TDD# T07-9107-035D. September 24.
- Ecology and Environment, Inc. 1993. Removal Funded: Kuhlman Diecasting Co., Stanley, Kansas. Removal Assessment Phase II. TDD# T07-9301-025. April 16.
- Ecology and Environment, Inc. 1995. Preliminary Assessment/Site Inspection for the Kuhlman Diecasting Site. Stanley, Kansas. TDD#T07-9412-506A. October 5.
- Environment International Government Ltd. 2011. Phase I Environmental Site Assessment.
- Seagull Environmental Technologies, Inc. 2012. Phase II Targeted Brownfields Assessment. Kuhlman Diecasting Site. September.

From 1991 to 1992, an EPA-funded removal action occurred at the site. During the removal action, over 1 million gallons of liquid wastes contaminated with metals and cyanide was treated on site and properly discharged. Wastes that could not be treated on site were transported off site for proper disposal. In

1992, following completion of the removal action, EPA conducted a followup removal assessment to determine whether further removal activity would be required. The removal assessment found elevated concentrations of metals (chromium, copper, nickel, and zinc) in soil (both surface and subsurface), groundwater, and sediment at the site. Nickel and zinc were detected at concentrations that exceeded EPA-established, site-specific action levels. However, no further removal activity was conducted. Several other sampling activities have been completed at the Kuhlman site since completion of the removal action. In 2002, EPA responded to a fire at the site and collected three water samples from areas of pooled water created as a result of the fire-fighting efforts. Those samples were analyzed for total metals and cyanide. No contaminants were detected above levels of concern. In 2004, EPA conducted additional sampling activities that included collection of groundwater samples from select monitoring wells and surface soil samples from across the site. Only one groundwater sample, collected from monitoring well GM-17 (downgradient of Lagoon #3) (see Appendix B, Figure 2), contained elevated levels of site-related contaminants. This sample contained elevated concentrations of chromium, copper, lead, nickel, and zinc. Numerous surface soil samples collected at locations surrounding the two wastewater evaporation sanitary lagoons in the southern portion of the site contained elevated concentrations of chromium, copper, nickel, and zinc.

In 2010, the Johnson County Environmental Department collected three samples of water that had accumulated in the basement of the site building. These samples were collected to assist with an ongoing criminal investigation associated with the site (not an environmental criminal investigation). The samples were analyzed for total metals and VOCs. No contaminants were detected above levels of concern.

In 2011, EIGov (under contract to EPA Region 7) conducted a Phase I ESA of the site. The Phase I ESA was completed as a TBA for EPA Region 7 and the Johnson County Government, which had applied for a Brownfields Grant to assess the site. The Phase I TBA report concluded that a Phase II ESA of the property should occur and should include collection of surface and subsurface soil, groundwater, surface water, and sediment samples. Additionally, the Phase I TBA report suggested that sampling should occur on the eastern portion of the site, as previous investigations had not focused on this area.

In September 2012, Seagull Environmental Technologies Inc., (Seagull) (under contract to EPA Region 7) conducted a Phase II TBA of the site. Phase II TBA activities included collection of soil (subsurface and surface soil), groundwater, surface water, and sediment samples at locations geographically covering the site. Sample results from the Phase II TBA did not identify widespread contamination across the site; however, elevated levels of VOCs and petroleum-related contaminants were detected in both soil and groundwater at two separate direct-push technology (DPT) boring

locations. Specifically, chlorinated VOCs were detected at concentrations up to 384 micrograms per liter (µg/L) in groundwater samples collected from the southwest portion of the site, just east of the wastewater evaporation sanitary lagoons and around the surface impoundments (see Appendix B, Figure 2). Many of the VOCs were detected at concentrations well above their respective Risk-Based Standards for Kansas (RSK) developed by the Kansas Department of Health and Environment (KDHE). Table 1 below summarizes select VOCs in groundwater results from the 2012 Phase II TBA.

TABLE 1

SELECTED GROUNDWATER SAMPLE RESULTS – 2012 PHASE II TBA
KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Sample Location	Sample Depth (ft bgs)	Analytical Results (micrograms per liter)				
		1,2-DCA	*cis*-1,2-DCE	TCE	TPH-GRO	TPH-DRO
SB-5-GW	24-28	<1.0	<1.0	<1.0	<500	**560**
SB-7-GW	20-24	**25.5**	25.3	**9.5**	<500	**510**
SB-11-GW	20-24	**299**	**294**	**384**	**640**	**<400**
KDHE RSK – Residential Pathway		**25**	**70**	**5**	**500**	**500**
KDHE RSK – Non-Residential Pathway		**46.1**	**70**	**5**	**500**	**720**

Notes:

Shaded result indicates analyte was detected above a KDHE RSK value.

<	Less than	GRO	Gasoline range organics
DCA	Dichloroethane	KDHE	Kansas Department of Health and Environment
DCE	Dichloroethene	RSK	Risk-based Standard for Kansas
DRO	Diesel range organics	TCE	Trichloroethene
ft bgs	Feet below ground surface	TPH	Total petroleum hydrocarbons

At one sample location on the east portion of the site (SB-6), petroleum-related contamination was detected at elevated concentrations in subsurface soil. The subsurface soil sample collected from SB-6 contained total petroleum hydrocarbons (TPH)-gasoline range organics (GRO) and diesel range organics (DRO) at concentrations that exceeded their respective RSK values for residential and non-residential land use. Presence of TPH at that location is likely associated with historical site operations involving bulk petroleum storage/transfer. Table 2 below summarizes selected soil sample results from the 2012 Phase II TBA.

TABLE 2

SELECTED SOIL SAMPLE RESULTS – 2012 PHASE II TBA
KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Sample Location	Sample Depth (ft bgs)	Analytical Results (milligrams per kilogram)	
		TPH-GRO	TPH-DRO
SB-6-14-16	14-16	**640**	**3,640**
SB-7-10-12	10-12	**539**	**7,970**
KDHE RSK – Residential Pathway		**220**	**2,000**
KDHE RSK – Non-Residential Pathway		**450**	**20,000**

Notes:

Shaded result indicates analyte was detected above a KDHE RSK value.

DRO	Diesel range organics	KDHE	Kansas Department of Health and Environment
ft bgs	Feet below ground surface	RSK	Risk-based Standard for Kansas
GRO	Gasoline range organics	TPH	Total petroleum hydrocarbons

Additionally, the 2012 Phase II TBA determined that elevated concentrations of metals occurred within surface impoundments in the southwest portion of the site. Past investigations also had determined that elevated levels of metals remained within one of the surface impoundments (Lagoon #3) at the northwest corner of the site. Sample results for the Phase II TBA indicated that waste also remains within the two southern surface impoundments (see Appendix B, Figure 2).

ENVIRONMENTAL SETTING

The site is in eastern Johnson County in northeastern Kansas. Johnson County lies partly in the Osage Cuestas, a portion of the Osage Plains physiographic province. Most of Johnson County consists of gently rolling uplands with a greater relief along streams (Ecology and Environment, Inc. [E & E] 1995).

Sedimentary rocks in northeast Kansas range from Late Pennsylvania to Late Cambrian in age. In the vicinity of the site, they have an aggregate thickness of approximately 1,700 feet. Structurally, the site lies within the Forest City basin. Shale and carbonates are the predominant lithologies of Paleozoic rocks in the Forest City basin, although sandstone comprises the bulk of Late Cambrian and Early Ordovician-age formations. Middle Ordovician through Mississippian-age formations are typically thick-bedded limestone and dolomite interbedded with thick shale. The overlying Middle Pennsylvania-age rocks are predominantly shale and channel sands with minor amounts of carbonates. The Upper Pennsylvania-age rocks that underlie the site are cyclothermic shale and limestone formations, varying in thickness from several inches to several tens of feet.

Eastern Johnson County is underlain by the Upper Pennsylvanian-age Kansas City Group. Within the Kansas City Group, thick limestone and thin shale of the Bronson Subgroup underlie thick shale and thin limestone of the Linn Subgroup.

The site is located just east of the Blue River. Unconsolidated sediments in the Blue River Valley are Wisconsinan to Recent in age. Thickness of the alluvium varies from approximately 30 feet in the northern and central portions of the site to approximately 20 feet in the southern portion of the site.

Previous investigations have determined that groundwater is approximately 10 to 15 feet below ground surface (bgs). Groundwater flow at the site is to the south-southwest toward the Blue River.

Topsoil at the site belongs to the Kennebec and Chase Series. Kennebec silt loam covers the southern portion of the site. Typically Kennebec soil is very dark grayish-brown, becoming very dark gray with depth, slightly hard, friable, with weak to moderate fine granular structure. Kennebec soils are deep, moderately well drained, moderately permeable, and level (E&E 1995).

Based on a recent topographic map, the site is approximately 893 feet above mean sea level (amsl). The site is relatively flat, as it is within a meander of the Blue River.

SAMPLING STRATEGY AND METHODOLOGY

Sampling activities are tentatively scheduled to begin in March 2013, and will require up to 7 days to complete. Sampling activities are planned to include two separate sampling events, discussed in more detail below. When applicable, the standard operating procedures (SOP) and chain-of-custody (COC) procedures referenced in the QAPP will be followed throughout the sampling activities to verify the integrity of the samples from time of collection until submittal to the laboratory for analysis. Disposal of investigation-derived wastes (IDW) and procedures for equipment and personal decontamination will be addressed in a site-specific health and safety plan prepared by Tetra Tech. Most IDW is expected to consist of disposable sampling supplies (gloves, paper towels, tubing, etc.) that will be disposed of off site as uncontaminated solid waste. Descriptions of the sampling strategy and procedures appear below.

Soil Sampling

Subsurface soil samples will be collected at 12 boring locations (see Appendix B, Figure 3). Those boring locations will be selected to investigate two separate areas of contamination—one on the east portion of the site, and one on the southwest portion of the site. Six of the borings will be on the east portion of the site to determine the extent of petroleum-related contamination detected during the 2012 Phase II TBA. The other six borings will be on the southwest portion of the site to further investigate the source of VOCs (detected in groundwater) and TPH-DRO.

At each boring location, continuous soil cores will be collected with a Geoprobe® direct-push apparatus. At each of the boreholes, a Geoprobe® Macro-Core soil sampler fitted with a disposable polyvinyl chloride (PVC) sleeve will be advanced to 20 feet bgs, groundwater, or refusal, whichever is encountered first. Encounter with groundwater is expected at approximately 20 feet bgs. The soil cores will be retrieved and screened for VOCs by use of a hand-held photoionization detector (PID). All soil cores will be logged to record lithology and soil characteristics. One sample will be collected from a 2-foot interval from each of the borings. The specific 2-foot sample intervals will be selected based on screening results, visual observations, and sampler judgment. In general, sample intervals that yield the highest PID readings will be selected for sampling. However, if no PID readings above background are observed at a boring location, the 2-foot sample interval will be determined by the field project manager based on field observations and sampler judgment. These field observations and sampler judgments will involve identification of visually stained soil or abnormal soil characteristics. If no contamination is indicated based on field screening readings, visual observations, or sampler judgment, the bottom 2-foot interval of soil from the boring will be sampled.

Soil samples will be submitted for laboratory analyses for VOCs, TPH-GRO (via Method OA-1), and TPH-DRO (via Method OA-2). Soil samples for analyses for VOCs and TPH-GRO will be collected following EPA Method 5035 guidelines, which recommend placing approximately 5 grams of soil into two 40-milliliter (mL) volatile organic analysis (VOA) vials pre-preserved with sodium bisulfate and into one VOA vial preserved with methanol. Soil samples for analysis for TPH-DRO (OA-2) will be collected from the PVC sleeves and placed in disposable aluminum pie pans for homogenization prior to transfer to 8-ounce glass jars. Following sample collection, excess soil will be returned to the respective boreholes. Remaining void space in the boreholes will be filled with bentonite.

Pertinent data, including analyses to be performed and exact sample locations, will be recorded on field sheets for each soil sample. All soil samples will be stored in coolers maintained at a temperature at or

below 4 degrees Celsius (°C) pending submittal to a START-contracted laboratory. Table 3 lists the proposed soil boring locations and rationale for selection of each.

TABLE 3

PROPOSED SOIL SAMPLE LOCATIONS

Sample Location	Sample Location Rationale
GP-1	East portion of site, determine extent of TPH contamination
GP-2	East portion of site, determine extent of TPH contamination
GP-3	East portion of site, determine extent of TPH contamination
GP-4	East portion of site, determine extent of TPH contamination
GP-5	East portion of site, determine extent of TPH contamination
GP-6	East portion of site, determine extent of TPH contamination
GP-7	Southwest portion of site, investigate source area of VOC contamination
GP-8	Southwest portion of site, investigate source area of VOC contamination
GP-9	Southwest portion of site, investigate source area of VOC contamination
GP-10	Southwest portion of site, investigate source area of VOC contamination
GP-11	Southwest portion of site, investigate source area of VOC contamination
GP-12	Southwest portion of site, investigate source area of VOC contamination

Notes:

TPH Total petroleum hydrocarbons
VOC Volatile organic compound

Groundwater Sampling

The sections below summarize the proposed groundwater samples to be collected from temporary Geoprobe® wells and permanent monitoring wells. Groundwater samples will be collected to determine current concentrations and the extent of VOCs and petroleum-related contaminants in groundwater.

Temporary Geoprobe® Wells

Twelve groundwater samples will be collected from temporary Geoprobe® wells that will be installed at the site (see Appendix B, Figure 3). Similar to soil sample locations, groundwater sample locations will be on the east and southwest portions of the site. At each temporary Geoprobe® well location, a Geoprobe® Screen Point 15 groundwater sampling apparatus will be driven below the water table, and a disposable 4-foot-long PVC screen will be deployed. A peristaltic pump with disposable polyethylene tubing will be used for collection of groundwater samples from the temporary Geoprobe® wells. Immediately after sampling, the temporary wells will be removed, and the open boreholes will be filled with bentonite.

The temporary well samples will be submitted for analyses for VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2). Water samples submitted for analyses for VOCs and TPH-GRO will be collected in four 40-mL vials preserved with hydrochloric acid (HCl) to a pH<2. Water samples to be analyzed for TPH-DRO (OA-2) will be collected in a 1-liter glass bottle. Table 4 lists the proposed temporary Geoprobe® well locations and rationale for selection of each.

TABLE 4

PROPOSED TEMPORARY GEOPROBE® WELL LOCATIONS

Sample Location	Sample Location Rationale
TW-1	East portion of site, determine extent of TPH-DRO contamination
TW-2	East portion of site, determine extent of TPH-DRO contamination
TW-3	East portion of site, determine extent of TPH-DRO contamination
TW-4	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-5	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-6	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-7	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-8	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-9	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-10	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-11	Southwest portion of site, determine extent of VOC and TPH groundwater contamination
TW-12	Southwest portion of site, determine extent of VOC and TPH groundwater contamination

Notes:

DRO Diesel range organics
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

Permanent Monitoring Wells

Three groundwater samples will be collected from permanent monitoring wells currently present at the southwest portion of the site (see Appendix B, Figure 3). Those monitoring wells are identified as GM-4, GM-7, and GM-15. Table 5 lists the monitoring wells to be sampled. Those wells have been selected to assist with delineation of the VOC groundwater plume. The wells will be sampled using a low-flow, or "micro-purge" technique. This sampling method involves placement of a pump intake at a specific depth within the screened interval (generally toward the middle or top of the screen) and discharge at a flow rate of 0.1 to 0.5 liters per minute (L/min). If the formation is suitably transmissive to prevent significant drawdown (> 0.1 meter) at these pumping rates, this technique can be used as a means of reducing pre-sampling purge volumes. Generally, no specialized equipment is required other than devices to monitor flow rates and field parameters of the well discharge. The technique can be performed with peristaltic, bladder, or electrical submersible pumps. As each well is purged, field parameters will be monitored

continuously using a water quality instrument. A sample will be collected when all field parameters have stabilized, indicating the purge discharge is representative of aquifer conditions.

TABLE 5

SUMMARY OF MONITORING WELLS

Monitoring Well	Total Depth of Well	Screened Interval
GM-4	19.5[A]	3-19.5[A]
GM-7	22.5[A]	7.5-22.5[A]
GM-15	25.0[B]	15.0-25.0[B]

Notes:

[A] Feet below ground surface
[B] No reference for depth measurement; assumed to be feet below top of casing
bgs Below ground surface

The permanent monitoring well samples will be submitted for analyses for VOCs, TPH-GRO (OA-1), and TPH-DRO (OA-2). Sample collection and handling will accord with the protocol described above.

Additionally, START will install/sample three permanent monitoring wells. These monitoring wells will be installed following receipt/evaluation of the groundwater sample results from the temporary Geoprobe® wells and permanent monitoring wells described above. Those sample results will be referenced to determine proper placement of the three new permanent monitoring wells. Specifically, the new monitoring wells will be placed at locations that will assist with delineation and continued monitoring of groundwater contamination. Three Geoprobe® small-diameter, pre-packed monitoring wells will be installed in accordance with Geoprobe® Technical Bulletin No. 99-2500. The 1-inch-diameter PVC monitoring wells will be installed by first driving 3.25 (outer diameter) -inch-diameter Geoprobe® rods to a depth determined in the field (approximately 10 feet below the static groundwater level). Well boring logs to be completed before the wells are installed by START will be referenced to determine the screened depth interval. A pre-packed well screen and attached PVC riser will then be lowered through the Geoprobe® rods, which will be withdrawn over the screen. As the rods are withdrawn, additional filter pack (sand) will be placed in the annular space to a depth of 2 feet above the top of the well screen. Bentonite chips or slurry will be placed above the sand to about 1 foot bgs. The pre-packed monitoring wells will be constructed with 10 feet of 0.010-inch slotted screen.

Each well will be protected from entry of foreign materials at all times. Upon completion, a protective casing will be installed around the well riser, which will extend no more than 2.5 feet above grade. The annular space between the well riser and protective casing will be filled with sand to approximately 6 inches below the top of the well. A hole will be drilled into the protective casing, approximately

2 inches above grade, to allow for drainage. Each well will have a locking cap. Additionally, to determine groundwater elevations and flow direction, surface and top of casing elevations will be surveyed to the nearest 0.01 inch by a surveyor licensed in the state of Kansas.

No sooner than 24 hours after grouting has been completed, well development will occur without use of dispersing agents or acids. The objectives of well development are to: (1) assure that groundwater enters the well screen freely, thus yielding a representative groundwater sample and an accurate water level measurement; (2) remove all water that may have been introduced during drilling and well installation; and (3) remove very fine-grained sediment derived from the filter pack and nearby formation so that groundwater samples are not highly turbid and silting of the well does not occur.

A pump (with portable power source) or tubing fitted with a check valve will be used to develop each well. Pumping of the well will be conducted to allow water to flow back into the well. Development will continue until visually clear water is produced from the well, or until a minimum of 10 well casing volumes have been removed. Purge water will be disposed of on site. After development of the wells, groundwater samples will be collected from the wells following the low-flow technique listed above.

A field sheet will be completed for each groundwater sample collected during the Phase II TBA. The field sheets will include the exact sample locations and analyses to be performed. All water samples will be stored in coolers maintained at a temperature at or below 4 °C until they are submitted to the START-contracted laboratory.

Concrete Chip Sampling

Ten samples of building materials (primarily concrete and cinder blocks) will be collected within the main site building (see Appendix B, Figure 2). Sampling of building materials will be conducted for disposal characterization purposes. Proposed site plans include demolition of the building. Past investigations determined that elevated concentrations of metals and cyanide were present in dust and concrete chip samples collected within the building. Based on those findings, sampling/analysis of building materials is warranted to evaluate disposal options. Specific sample locations will be selected in the field by the START Project Manager to represent the entire building. START will adhere to EPA SOP 4231.2011—"Chip, Wipe, and Sweep Sampling"—for sample collection. Samples will be collected by using hand tools (decontaminated hand sledge and chisel) and a concrete core drill. The samples will be transferred to 8-ounce glass jars and submitted for cyanide analysis and Toxicity Characteristic Leaching Procedure (TCLP) analysis. The TCLP analysis will be specifically for metals regulated under the Resource Conservation and Recovery Act (RCRA) (including mercury).

Quality Control Samples

To evaluate sample quality control (QC), one equipment rinsate blank (water), one field blank (water), and one trip blank (water) will be collected, as specified in Section 2.5 of the QAPP form. The equipment rinsate sample will be collected during the course of field activities (as determined by the START Project Manager), following decontamination of the Geoprobe® Screen Point 15 groundwater sampler. Decontamination of the Geoprobe® samplers and rods will proceed by application of a tap water and Alconox wash and tap water rinse. Because evaluation of total method precision is not required for this project, no field duplicates will be collected.

ANALYTICAL METHODS

All samples will be submitted to a START-contracted laboratory. START will competitively bid the analytical work from its pool of pre-qualified laboratories. Soil and groundwater samples will be analyzed according to EPA SW-846 Methods for VOCs (Method 8260), TPH-GRO (Method OA-2), and TPH-DRO (Method OA-2) (Methods OA-1 and OA-2 are not SW-846 Methods). Building material/concrete chip samples will be submitted for analyses for cyanide (Method 9013) and TCLP RCRA metals (including mercury) (Method 1311 for extraction, Methods 6010 and 7470 for analysis). Soil and groundwater analytical results will be compared to KDHE RSK values. Standard detection limits and turnaround times for those methods will be adequate for this project. Appropriate containers and physical/chemical preservation techniques will be employed during the field activities to help verify that representative analytical results are obtained. Submittal of samples to the laboratory is expected in March 2013.

REFERENCES

Ecology and Environment, Inc (E&E). 1995. Preliminary Assessment/Site Inspection for the Kuhlman Diecasting Site. Stanley, Kansas. TDD# T07-9412-506A. October 5.

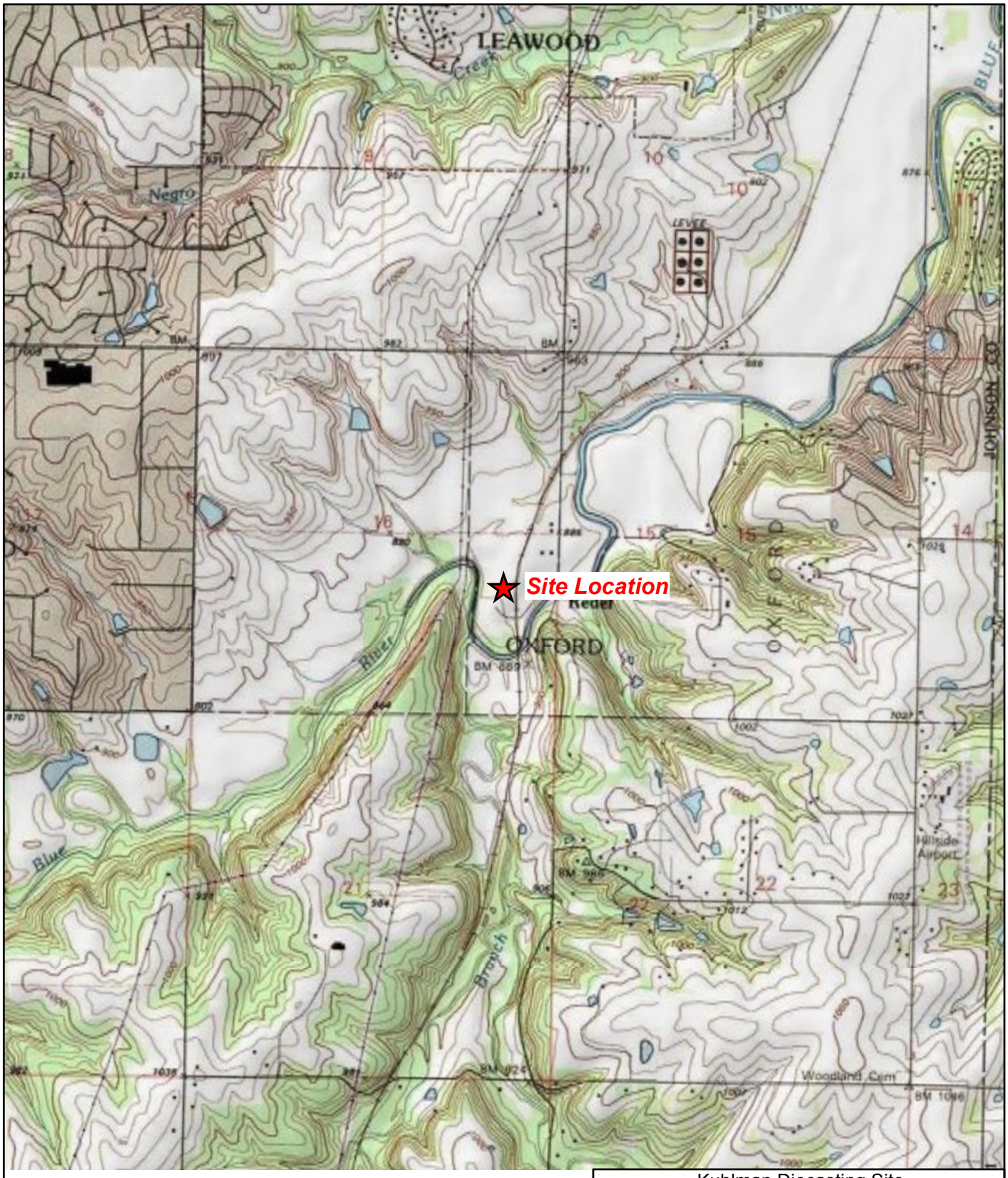
Environment International Government Ltd. (EIGov). 2011. Phase I Environmental Site Assessment. Kuhlman Diecasting Site. Stanley, Kansas.

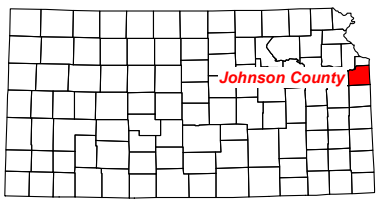
U.S. Environmental Protection Agency (EPA). 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. OSWER No. 9200.1-85, EPA540-R-08-005. January.

U.S. Geological Survey (USGS). 1991. Stilwell, Kansas, 7.5-minute Series Topographic Quadrangle Map.

APPENDIX B

FIGURES





Source: USGS Belton, Kansas 7.5 Minute Topo Quad, 1991
USGS Stilwell, Kansas 7.5 Minute Topo Quad, 1991

N

0 1,000 2,000

Feet

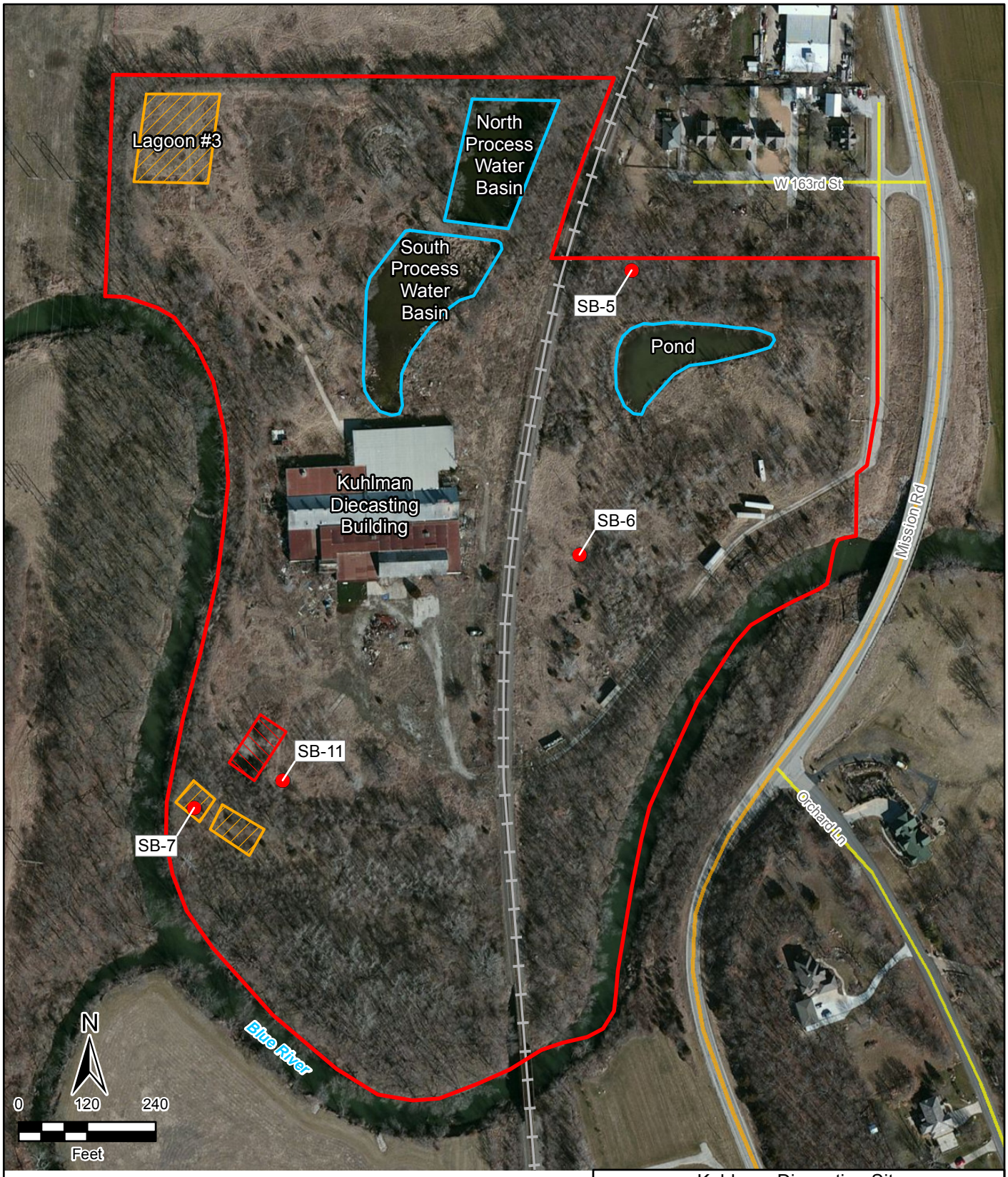
Kuhlman Diecasting Site
16400 Mission Road
Stanley, Kansas

Figure 1
Site Location Map

TETRA TECH

Date: 02/08/13 Drawn By: Nick Wiederholt Project No: X9004.L.06.0002.015.024

X:\G\9004\0002\015\024\Projects\mxd\Figure1.mxd



Legend

- 2012 Phase II TBA sample location
- Missouri Pacific Railroad
- Major road
- Street
- Approximate site boundary
- Water body
- Surface impoundment (capped)
- Water evaporation sanitary lagoon
- TBA Targeted Brownfields Assessment

Source: ArcGIS Online, Bing Maps Aerial, 2012; HSIP Gold, 2007

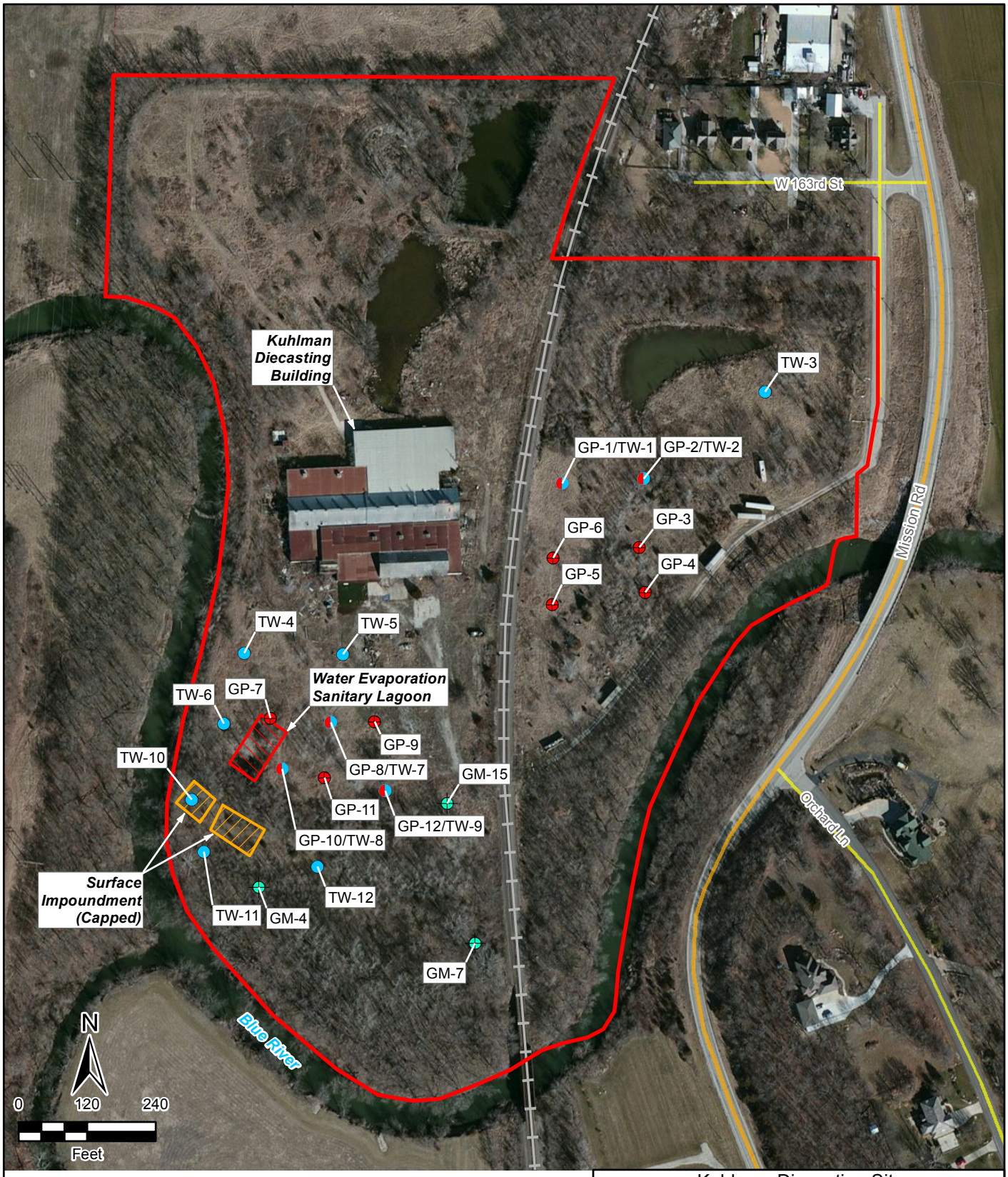
Kuhlman Diecasting Site
16400 Mission Road
Stanley, Kansas

Figure 2
Site Layout Map

TETRA TECH

Date: 02/08/13 Drawn By: Nick Wiederholt Project No: X9004.L.06.0002.015.024

X:\G\9004\0002\015\024\Projects\mxd\Figure2.mxd



Legend

Proposed sample locations

- Groundwater sample location
- Monitoring well sample location
- Soil sample location
- Soil/Groundwater sample location

- Missouri Pacific Railroad
- Major road
- Street
- Approximate site boundary

Note: 10 samples of building materials will be collected for disposal characterization.

Source: ArcGIS Online, Bing Maps Aerial, 2012; HSIP Gold, 2007

X:\G\9004\0002\015\024\Projects\mxd\Figure3.mxd

Kuhlman Diecasting Site
16400 Mission Road
Stanley, Kansas

Figure 3
Proposed Sample Location Map

TETRA TECH

Date: 02/08/13 Drawn By: Nick Wiederholt Project No: X9004.L.06.0002.015.024