

# Green Remediation Evaluation

FOUNDRY PARCEL OF PRIMECAST, INC.  
LPC NO.: 2010450019 – WINNEBAGO COUNTY

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY REVOLVING LOAN FUND PROJECT

September 27, 2013

Terracon Project No. 11127009A



**Prepared for:**

City of South Beloit  
South Beloit, Illinois

**Prepared by:**

Terracon Consultants, Inc.  
Naperville, Illinois

Offices Nationwide  
Employee-Owned

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**Terracon**

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

September 27, 2013

South Beloit City Hall  
519 Blackhawk Boulevard  
South Beloit, Illinois 61080

Attn: Ms. Alice Schoonover

Re: Green Remediation Evaluation  
LPC No. 2010450019 -- Winnebago County  
Foundry Parcel of Primecast, Inc.  
Terracon Project No. 11127009A

Dear Ms. Schoonover:

Terracon Consultants, Inc. (Terracon) is pleased to submit this this Green Remediation Evaluation for the Foundry Parcel of Primecast, Inc. located at northeast corner of Gardner Street (Highway 75) and Blackhawk Boulevard (Highway 2) in South Beloit, Illinois. This document is being submitted to fulfill the requirements of the Cooperative Agreement between the United States Environmental Protection Agency (USEPA) and the City of South Beloit. This evaluation has been conducted in general accordance with draft ASTM Standard Guide for Greener Cleanup (ASTM WK35161). Throughout the document, the section headers reference the corresponding sections in ASTM Guidance.

Sincerely,  
**Terracon Consultants, Inc.**



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Senior Project Manager

 FOR

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Appendix A – Summary of GMP Process

35 IAC.....	Title 35 Illinois Administrative Code
bgs.....	below ground surface
City.....	City of South Beloit
cm.....	centimeter(s)
CWS.....	Community Water Supply
ESA.....	Environmental Site Assessment
eV.....	electron-volt
f <sub>oc</sub> .....	Organic Carbon Content
g.....	gram(s)
GIS.....	Geographical Information System
GRO.....	Groundwater Remediation Objective
Guidance.....	Draft ASTM Guidance for Greener Cleanup (WK35161)
IEPA.....	Illinois Environmental Protection Agency
IPCB.....	Illinois Pollution Control Board
ISGS.....	Illinois State Geological Survey
ISWS.....	Illinois State Water Survey
JULIE.....	Joint Utility Locating Information for Excavators
kg.....	kilogram(s)
L.....	liter(s)
MBRG.....	Municipal Brownfields Redevelopment Grant
mg.....	milligram(s)
mL.....	milliliter(s)
N/A.....	Not Applicable
NFR.....	No Further Remediation
OSE.....	IEPA Office of Site Evaluation
PAH.....	Polycyclic Aromatic Hydrocarbons
PCB.....	Polychlorinated Biphenyl
PID.....	Photoionization Detector
PIN.....	Parcel Identification Number
ppm.....	part(s) per million
PVC.....	Polyvinyl Chloride
PWS.....	Public Water Supply
RA.....	Remedial Applicant
RACR.....	Remedial Action Completion Report
RAP.....	Remedial Action Plan
RCRA.....	Resource Conservation and Recovery Act
REC.....	Recognized Environmental Condition
RO.....	Remediation Objective
ROR.....	Remediation Objectives Report
sec.....	second(s)
SIR.....	Site Investigation Report
SPLP.....	Synthetic Precipitation Leaching Procedure
SRO.....	Soil Remediation Objective
SSL.....	Soil Screening Level
SVOC.....	Semivolatile Organic Compound
SWAP.....	Source Water Assessment Program
TACO.....	Tiered Approach to Corrective Action Objectives
TCL.....	Target Compound List
TCLP.....	Toxicity Characteristic Leaching Procedure
USEPA.....	United States Environmental Protection Agency
USGS.....	United States Geological Survey
UST.....	Underground Storage Tank
VOC.....	Volatile Organic Compound
yr.....	year(s)

**GREEN REMEDIATION EVALUATION  
2010450019 -- WINNEBAGO COUNTY  
FOUNDRY PARCEL OF PRIMECAST, INC.**

**Terracon Project No. 11127009A  
September 27, 2013**

## **1.0 INTRODUCTION [8.3.1.1]**

### **1.1 Report Author and Organization**

This evaluation is being conducted by Terracon Consultants, Inc. (Terracon) on behalf of the City of South Beloit (the client).

### **1.2 Identification of Project Team**

A summary of the Project Team members is provided in Table 1-1.

**Table 1-1 Summary of Project Team**

<b>Team Member Designation</b>	<b>Team Member Name (Organization)</b>
Site Owner Representative	Mayor Michael Duffy (City of South Beloit)
Illinois EPA Brownfields Representative	Steve Colantino (IEPA) Mike Charles (IEPA)
Illinois EPA SRP Project Manager	Rhett Rossi (IEPA)
Lead Environmental Professional	Linda Yang, P.G. (Terracon)
User	Richard O'Brien, P.E. (Terracon)

### **1.3 Report Completion Date**

This document was completed on September 27, 2013.

### **1.4 Property Name**

The property name is Foundry Parcel of Primecast, Inc.

### **1.5 Site Location**

The remediation site addressed in this evaluation is located at the northeast corner of Gardner Street (Highway 75) and Blackhawk Boulevard (Highway 2) in South Beloit, Illinois and consists of an approximate 3.18-acre parcel of land that consists of the former Beloit Foundry.

### **1.6 Site Identification Number(s)**

The site is currently enrolled in the IEPA SRP under LPC Number 2010450019.

## **1.7 Lead Oversight Agency**

The lead oversight agency for the project is the Illinois Environmental Protection Agency.

## **1.8 Cleanup Program**

The site is currently enrolled in the IEPA Site Remediation Program. Mr. Rhett Rossi is the remediation site project manager for the IEPA.

## **1.9 Site History**

A detailed site history was provided in the May 2009 Comprehensive Site Investigation, Remediation Objectives Report, and Remedial Action Plan (CSI/ROR/RAP) conducted by V3 Companies of Illinois, Ltd. (V3) previously submitted to the IEPA. The site was occupied by the main building of the former Beloit Foundry / Primecast, Inc. from at least 1852 to 2003. On December 16, 2002, the City of South Beloit purchased the property and all buildings were demolished in 2003. The fire department building on the south side of the site was constructed in November of 2003. The property is currently vacant with several demolished foundations and debris piles.

## **1.10 Purpose**

The purpose of this document is to provide best management practices for conducting the selected remedial action at the project site in a way that reduces the environmental footprint of the remediation. Specifically, this document provides recommendations to reduce remediation impacts to environmental media and the surrounding community in an economically feasible way.

# **2.0 SITE STATUS [8.3.1.2]**

## **2.1 Size of the Site**

The site is approximately 3.18 acres and consists of vacant land with several demolished foundations and debris piles.

## **2.2 Current Phase of Cleanup**

The site is currently in the remedy design/implementation phase of clean up. A Remedial Action Plan Addendum (RAP) was submitted to the IEPA SRP on September 7, 2012 outlining the remedy design and plans for implementation. The remedy for the site includes soil excavation and disposal, backfill with clean soil, and utilizing institutional controls for groundwater use restriction.

## **2.3 Potential/Actual Environmental Media Impacts and Contaminants**

The actual environmental media identified as impacted at the site includes soil and groundwater. As the client is seeking a Comprehensive NFR letter from the IEPA, the contaminants of concern for the site include those outlined in 35 IAC 740 Appendix A.

Specifically, site sampling has indicated that exceedances of the Tier 1 ROs at the site include polynuclear aromatic hydrocarbons (PNAs), vinyl chloride, polychlorinated biphenyls (PCBs), arsenic, and lead in soil and thallium, manganese, and lead in groundwater.

## **2.4 Site Use**

### **2.4.1 Historical**

As outlined in Section 1.9, the CSI/ROR/RAP indicates that the site was used as a foundry since 1852.

### **2.4.2 Current**

The City of South Beloit purchased the property in 2002, and all structures were demolished in 2003. The property is currently vacant with several demolished foundations and debris piles.

### **2.4.3 Anticipated Future**

Future site use has not been completely defined. The City is currently evaluating the option to build a Fire Department Training Facility at the Foundry parcel. The eventual NFR letter for the site will incorporate any institutional controls and maintain engineered barriers.

## **2.5 Human or Ecological Receptors of Contamination**

Potential receptors of contamination have been evaluated at the site using the Tiered Approach to Corrective Action Objectives (TACO) outlined in 35 IAC 742. Potential receptors at the site include occupants and construction workers through the soil ingestion, soil inhalation, soil component of the groundwater ingestion (soil component) and groundwater ingestion exposure routes.

Evaluation of ecological receptors is not conducted in the IEPA TACO regulations. Potential receptors may include local migratory/local birds, small mammals and subsurface invertebrates/micro-organisms through ingestion or inhalation.

## **2.6 Adjacent Property Use**

Adjacent property use consists of commercial properties. Current adjacent property use includes a railroad and a creek to the north of the site, Warner Electric to the east, Gardner Street to the south and Blackhawk Boulevard to the west beyond which are commercial properties.

## **2.7 Stakeholder Involvement**

The City of South Beloit has held City Council meetings, public meetings and published public notifications regarding the site cleanup. Communication with various community organizations has been ongoing and they have showed significant project support.

## **2.8 Cleanup Activities to Date**

Cleanup activities conducted to date include remedy selection. Site assessment has consisted of the site investigation necessary to satisfy the requirements of the CSIR. Upon identification of contamination above Tier 1 ROs remedy selection was documented in a ROR/RAP and RAP Addendum prepared by Terracon on September 7, 2012. The RAP Addendum proposed that excavation and disposal be conducted to remediate the site. The IEPA approved the RAP Addendum in correspondence dated September 26, 2012.

## **2.9 Technologies/Engineering Controls Implemented**

The IEPA Approved RAP includes a combined remedy approach including the use of remedial excavation and backfill, engineered barriers, and institutional controls at the site. At the impacted areas of the site (impacts associated with excavation areas depicted in Exhibit 2 of the RAP Addendum), the top three feet of soil will be excavated and disposed of at a permitted landfill. The excavation will be backfilled with clean soil that will serve as an engineered barrier for the soil ingestion exposure route.

## **2.10 Cleanup Goals**

Cleanup goals for the site are documented in the RAP addendum prepared by Terracon dated September 7, 2012. As outlined in the RAP addendum, cleanup goals have been established to support exclusion of the soil ingestion and inhalation exposure routes consistent with the requirements of 35 IAC 742.305.

Cleanup goals for the groundwater ingestion exposure routes will be established through a groundwater use restriction already in place by the City of South Beloit.

## **2.11 Site Use Restrictions**

Based on the selected remedy institutional controls will be placed on the site. The institutional controls will include maintaining the surface engineered barriers, establishment of a construction worker caution area, and enforcement of the groundwater use restriction currently in place for the City of South Beloit.

# **3.0 CLEANUP PHASE EVALUATION [8.3.1.3]**

## **3.1 Applicable Cleanup Phase**

The cleanup phase being evaluated in this document is the remedy implementation phase. This phase constitutes the final cleanup phase of the project as the selected remedy does not include long term operations or monitoring.

## **3.2 Evaluation Process**

The process utilized for evaluating best management practices (BMPs) for the remedy implementation phase of the project consists of the BMP Process outlined in the draft ASTM



## **Green Remediation Evaluation**

Foundry Parcel of Primecast, Inc. ■ South Beloit, Illinois  
September 27, 2013 ■ Terracon Project No. 11127009A



Guidance. A quantitative evaluation was not conducted for the project based on correspondence with the IEPA Office of Brownfields Assistance.

### **3.3 Best Management Practices for Cleanup Phase**

#### **3.3.1 BMP Opportunity Assessment**

The BMP Opportunity Assessment was conducted to identify BMPs that may be applicable to the current cleanup phase. Terracon consulted Appendix X2 of the Guidance for Potential BMPs applicable to the site. Potential BMPs were considered based solely on the cleanup phase and without regards to cost, logistics or relative benefits to other BMPs. A list of potential BMPs and the core element(s) they address is provided in Table 3-1

## Green Remediation Evaluation

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**Table 3-1 Summary of Potential BMPs**

Category	BMP	Core Element(s) Addressed
Materials	Steam clean or use phosphate-free detergents to decontaminate equipment	W <sup>1</sup> ; MW <sup>2</sup> ; LE <sup>3</sup>
Materials	Use dedicated materials when performing multiple rounds of sampling of all matrices.	MW
Power and Fuel	Use biodiesel produced from waste or cellulose based products, preferring local sources to reduce transportation impacts	MW
Project Planning and Team Management	Use local staff, including subcontractors, when possible to minimize resource consumption	E <sup>4</sup> ; A <sup>5</sup> ; W; MW
Project Planning and Team Management	Establish green requirements as evaluation criteria in the selection of contractors and include language in RFPs, RFQs, subcontracts, contracts, etc.	E; A; W; MW; LE
Project Planning and Team Management	Target Treatment Zone (TTZ) and select appropriate performance standards to minimize volume requiring treatment relative to remedial goals	E; A; W; MW; LE
Site Preparation/Land Restoration	Use onsite or nearby sources of backfill material for excavated areas, if shown to be free of contaminants	E; A; MW
Site Preparation/Land Restoration	Minimize soil compaction and land disturbance during site activities by restricting traffic to confined corridors and protecting ground surfaces with biodegradable covers, where possible.	W; LE
Vehicle and Equipment Management	Use biodegradable hydraulic fluids on hydraulic equipment such as excavators	MW
Vehicle and Equipment Management	Implement an idle reduction plan	E; A; LE
Vehicle and Equipment Management	Minimize diesel emissions through the use of retrofitted engines, use of low sulfur diesel or alternative fuels, or filter/treatment devices (BACT)	A

<sup>1</sup> W - Water

<sup>2</sup> MW – Materials and Waste

<sup>3</sup> LE – Land and Ecosystems

<sup>4</sup> E - Energy

<sup>5</sup> A - Air

### 3.3.2 BMP Prioritization

BMPs identified during the Opportunity Assessment were evaluated based on the ability of each BMP to reduce the environmental footprint of the cleanup activity. BMPs that were determined to have the greatest ability to reduce the environmental footprint were assigned a “high” priority, those with a modest ability to reduce the environmental footprint were assigned a “moderate” priority and those with the least likelihood to reduce the environmental footprint were assigned a “low” priority. A summary of the prioritized BMPs is provided in Table 3-2. A brief description of the prioritization rationale is presented below.

**Table 3-2 Summary of Prioritized BMPs**

Priority	BMP	Core Element(s) Addressed
High	Target Treatment Zone (TTZ) and select appropriate performance standards to minimize volume requiring treatment relative to remedial goals	E; A; W; MW; LE
High	Use onsite or nearby sources of backfill material for excavated areas, if shown to be free of contaminants	E; A; MW
High	Use local staff, including subcontractors, when possible to minimize resource consumption	E; A; W; MW
High	Use biodiesel produced from waste or cellulose based products, preferring local sources to reduce transportation impacts	MW
Moderate	Implement an idle reduction plan	E; A; LE
Moderate	Minimize diesel emissions through the use of retrofitted engines, use of low sulfur diesel or alternative fuels, or filter/treatment devices (BACT)	A
Moderate	Steam clean or use phosphate-free detergents to decontaminate equipment	W; MW; LE
Moderate	Establish green requirements as evaluation criteria in the selection of contractors and include language in RFPs, RFQs, subcontracts, contracts, etc.	E; A; W; MW; LE
Moderate	Minimize soil compaction and land disturbance during site activities by restricting traffic to confined corridors and protecting ground surfaces with biodegradable covers, where possible.	W; LE
Low	Use dedicated materials when performing multiple rounds of sampling of all matrices.	MW
Low	Use biodegradable hydraulic fluids on hydraulic equipment such as excavators	MW

BMPs were assigned a high priority based on their ability to have the greatest positive influence on multiple core elements. Specifically, linking the cleanup to the redevelopment of the site and using local contractors, as available, could potentially result in dramatically

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lower impacts to at least four of the five core elements. The benefits of these BMPs will likely expand beyond the core elements into the local community with respect to local job opportunities and development of an underserved area of the City.

BMPs were assigned a moderate priority based on their potential for positive influence on one or more core elements limited to within the technical scope of the project. The moderate priority BMPs typically include the use of materials or consumption of energy during implementation of the cleanup phase. BMPs were assigned a low priority based on the likelihood that implementation would not result in positive influences on core elements during the cleanup. BMPs assigned a low priority were not considered during steps in the BMP Process.

### 3.3.3 BMP Selection

The prioritized BMPs were further evaluated based on project specific factors. The high and moderate priority BMPs were evaluated for implementability, effectiveness, reliability, risks, cost and community concerns. A brief summary of this evaluation is provided below.

- **Target Treatment Zone (TTZ)** - This BMP of targeting areas above Tier 1 Remediation Objectives (ROs) and further evaluating impacts by calculating Tier 2 ROs resulted in limiting site excavation. This will result in minimizing truck trips to and from the site, and thereby minimize air emissions, offsite landfill use, stormwater runoff, material use, and community/traffic disruption.
- **Use nearby sources of clean backfill material** – The proximity of a clean fill source near the remediation site allows this BMP to reduce resource use by limiting truck trips to and from the site.
- **Use local staff, including subcontractors, when possible to minimize resource consumption** – This BMP of utilizing local hires will minimize passenger car travel to and from site, and thereby minimize air emissions, help relieve traffic congestion, material use, and help facilitate good community relations.
- **Use local biodiesel produced from waste or cellulose based products** – This BMP will minimize the production of petroleum based air emissions.
- **Implement an idle reduction plan** – This BMP will reduce energy use and noise emissions, help air quality in the urban area, and help community relations.
- **Minimize diesel emissions through the use of retrofitted engines, use of low sulfur diesel or alternative fuels, or filter/treatment devices** – This BMP will reduce the impact of emissions produced during the remediation of the site.

- **Steam clean or use phosphate-free detergents to decontaminate equipment** – Utilizing more environmentally benign chemicals will limit the impact that produced wastes create.
- **Establish green requirements as evaluation criteria in the selection of contractors and as part of project language** – This BMP will cause contractors to evaluate their own activities and promote the culture of environmentally beneficial practices.
- **Minimize soil compaction and land disturbance during site activities by restricting traffic to confined corridors** – This BMP will reduce the impact to the condition of the site and help restore the area at the conclusion of the project.

#### **3.3.4 BMP Implementation**

The selected BMPs will be implemented during the cleanup activities. At this time, the final cleanup activities and timeframe have not completely defined. If individual BMPs are identified during the cleanup as impractical, cost-prohibitive or unacceptable to the public then an addendum to this document will be submitted documenting those conditions.

#### **3.3.5 BMP Documentation**

The Guidance requires that the BMP evaluation described in this document be summarized in a standalone table. This summary is provided in Appendix A.

### **3.4 Status of BMP Implementation**

The BMPs discussed in this document will be implemented in the near future at the site.

## **4.0 ANTICIPATED ENVIRONMENTAL FOOTPRINT REDUCTIONS** **[8.3.1.4]**

Based on discussions with IEPA, qualitative evaluations will be conducted on the following.

### **4.1 Total Energy Use**

Total energy use for the project will be reduced by remediation of a TTZ, limiting the extent of required excavation, using local sources of backfill, using an idle reduction plan, and using local staff and subcontractors. The greatest energy savings would be from minimizing energy required for excavation of soil off site with use of a TTZ, and minimizing travel distances by utilizing local sources of backfill.

#### **4.2 Air Pollutants and Greenhouse Gas Emissions**

Air emissions will be reduced by remediation of a TTZ, using an idle reduction plan to reduce truck diesel emissions, utilizing biodiesel, and minimizing emissions from travel through use of local staff and a local backfill source. Air and carbon dioxide greenhouse emissions may be reduced the most from reducing total diesel engine truck / excavator run time by minimizing excavation of soil off site with TTZ, reducing travel distances, and use of an idle reduction program.

#### **4.3 Water Resource Impacts**

Water resource impacts would be reduced to a moderate degree by reducing excavation size from the remediation of a TTZ, by reducing impact to permeable soils by confining traffic to corridors, and by minimizing days of site construction and potential runoff to surrounding storm sewers, and eventually waterways.

#### **4.4 Waste/Materials Management**

Waste will be reduced by remediation of a TTZ, using local sources of backfill, and using local staff. The waste reduction would be from minimizing excavation of soil off site with TTZ.

#### **4.5 Land/Ecosystem Management**

Land/Ecosystem preservation will be achieved by reducing excavation size from the remediation of a TTZ, confining traffic to corridors, and implementing an idle reduction plan. These measures will reduce the footprint of the overall project on the land and will protect the existing state of the environment.

### **5.0 DECLARATION [8.3.2]**

A greener cleanup evaluation was conducted in general conformance with the draft ASTM WK35161 Standard Guide for Greener Cleanups for the Foundry Parcel of Primecast, Inc. located at the northeast corner of Gardner Street and Blackhawk Boulevard in South Beloit, Winnebago County, Illinois by Terracon Consultants, Inc. of Naperville, Illinois.

### **6.0 PUBLIC AVAILABILITY [8.4]**

This document will be available for public inspection at the City of South Beloit offices located at South Beloit City Hall, 519 Blackhawk Boulevard, South Beloit, Illinois 61080.

## **APPENDIX A**

### Tabular Summary of BMP Process

