STATE COOPERATIVE AGENCY DECISION STATMENT
Kansas Department of Health and Environment
Bureau of Environmental Remediation

SITE NAME: **Eagle Picher Smelter Site (C3-011-72090)**

CITY/COUNTY: **Galena, Cherokee County**

DATE: **August 3, 2012**

MEDIA IMPACTED: **Soil, sediment, surface water**

LAND USE (Current): **Commercial**

SITE BACKGROUND: The Eagle Pitcher Smelter Site is located in the northeast corner of Galena, Cherokee County, Kansas, as shown on Figure 1. The facility, in operation from 1878 to 2004, processed lead, zinc, and cadmium ores. Other activities included the production of zinc oxide, zinc sulfate, manganese sulfate, and manganese dioxide as well as the operation of a sulfuric acid plant. In April 2005, EaglePicher Holdings, Inc. declared bankruptcy under Chapter 11 of Title 11 of the United States Code. A subsequent Kansas Settlement Agreement established a trust fund for the remediation of contamination at the 68-acre site. After this settlement was negotiated, ownership of additional undeveloped outparcels was disclosed by EaglePicher Holdings, Inc., bringing the total to 148 acres. The site is currently being addressed under the bankruptcy settlement between Eagle Picher Custodial Trust, the Kansas Department of Health and Environment (KDHE), and the Environmental Protection Agency (EPA). KDHE is the lead agency for environmental issues at the site.

Soil, sediment, and surface water contamination were identified in 2006 during an investigation conducted by KDHE. The Eagle Picher Trust conducted an Extent of Contamination Investigation in 2007 to determine the extent of contamination in the smelter plant area and outparcels, as well as in sediments and surface water of Short Creek. Lead, cadmium, arsenic and mercury were identified in surface and subsurface soils at concentrations above respective KDHE's Tier 2 Levels for the Soil Pathway for non-residential use as specified in KDHE's Risk-Based Standards for Kansas (RSK) Manual, and arsenic, cadmium, chromium, lead, mercury and zinc were identified in sediment above the Probable Effect Concentrations (PECs) in Short Creek. Cadmium, lead and zinc in surface water in Short Creek exceeded acute and chronic Aquatic Life Water Quality Criteria (ALWQC) standards.

In accordance with the Settlement Agreement, the Eagle Picher Trust conducted a Building Cleanout in 2008 which included decontamination of three site buildings, the razing of one building and the disposal of sulfuric acid, PCB equipment and PCB-contaminated materials. A 2009 Supplemental Extent of Contamination Investigation established that most outparcel lead contamination was contributed by non-site related sources (i.e., regional mining activities). During this investigation it was also determined that a majority of the mercury-contaminated materials encountered during the original investigation were not characteristically hazardous, and that sediments in

the Spring Branch of Short Creek exceeded PECs for arsenic, cadmium, chromium, lead, and zinc. Analysis of surface water samples collected by KDHE in 2009 indicated that mercury was not present in Short Creek at concentrations above laboratory detection limits. Additional site characterization was conducted in 2010 to determine the thickness and volume of waste piles west of the smelter plant area. Data collected were used to estimate that approximately 275,000 cubic yards of contaminated material at the site exceed applicable threshold levels.

An Evaluation of Remedial Alternatives was conducted in 2011 to identify the most cost-effective way to address contamination at the site. The proposed remedy, on-site consolidation and encapsulation of waste, contaminated soil and sediment, was further refined after meeting with stakeholders to four placement options: an 11.6 acre encapsulation cell on the west side of the smelter plant area, a 7.6 acre encapsulation cell on the east side of the smelter plant area, or two configurations with encapsulation cells on both the west and east sides of the former smelter plant area, one with a 5.4 acre west and a 6.7 east encapsulation cell and one with a 5.6 acre west and 6.7 acre east encapsulation cell.

REMEDIAL PLAN:

The primary Contaminants of Concern (COCs) at the site are lead, arsenic and mercury found in smelter waste, soils and stream sediments. Remedial Action Objectives (RAOs) include preventing human exposure through direct contact with and/or ingestion of contaminated soil and smelter waste with COCs in excess of KDHE's Tier 2 Levels for non-residential use; precluding adverse impact from contaminated soil, sediment and smelter waste to aquatic life, individuals of a threatened or endangered species and other ecological receptors; and preventing migration of soil, sediments and smelter waste that contain COCs in excess of applicable standards that could result in greater environmental degradation of surface water, sediment, soils and the adjacent environment.

With the input of stakeholders and in the interest of promoting redevelopment of the western area of the site, the corrective action selected to achieve site RAOs includes excavation, consolidation and capping of contaminated soil and smelter waste in excess of non-residential Tier 2 Levels, as well as contaminated sediments in excess of the mercury PEC, in a single consolidation cell east of the former smelter plant area as shown on Figures 2 and 3. The consolidation cell will be located within the 68-acre area of concern and outside of the 100-year flood plain of Short Creek as required by the Bankruptcy Settlement Agreement (June 30, 2006). Areas within the fenced former smelter plant area will be covered with a six-inch compacted gravel layer. An Environmental Use Control (EUC) will be placed on the site to preclude the use of the property for residential use and to prohibit future intrusive activities that may damage the cap, among other restrictions. A long-term Operations and Maintenance plan will be developed which will include routine inspections, and repairs will be conducted as needed to ensure long-term effectiveness of the remedy. Total cost of this remedy is estimated to be $4,993,000.

Specific requirements of the remedial plan include the following:

(1) Approximately 275,000 cubic yards of contaminated soil, smelter waste and sediments will be consolidated, graded, compacted and covered with an engineer designed cap consisting of geomembrane liner, geosynthetic drainage layer, and two-foot thick soil layer. The encapsulation cell will be seeded and mulched to create a vegetative cap. Fencing will be installed around the cell to prevent unauthorized access and to protect the structural integrity of the cell.

(2) Areas within the fenced smelter plant area will be covered in place with a minimum of six inches of clean compacted gravel.

(3) Sediments below the high-water mark of Short Creek that contain mercury at concentrations above its PEC will be excavated to a maximum depth of one foot and placed into the consolidation cell. In areas of Short Creek below the low-water mark, excavated sediment will be separated and clean materials returned to the stream. Three thousand linear feet of stabilization material will be installed along the creek bank to prevent erosion and re-establish vegetation.

(4) Two mercury settling ponds will be excavated to the water table. Contaminated material located below the water table will not be removed but will be covered with earth-stabilizing materials and soil and revegetated to prevent direct contact and future erosion.

(5) Mercury-contaminated waste materials and piles located on Outparcels A and E will be excavated and placed within the consolidation cell.

(6) All excavated material will be placed in the consolidation cell unless material containing mercury has been determined to be characteristically hazardous. All hazardous material will be disposed of off-site at a licensed hazardous waste disposal facility.

(7) 26.1 acres of excavated area will be regraded, direct-seeded and mulched.

(8) Additional characterization of surface water quality will be conducted following construction of the consolidation cell.

(9) A EUC will be established to restrict future use of the site where there is residual contamination above residential Tier 2 levels. An application to the EUC program must be submitted within 90 days of the date of the Final Agency Decision Statement.

(10) A Soil Waste Management Plan (SWMP) will be developed which will direct the handling of potentially contaminated soil or waste encountered during future use or development of the site.

(11) A long-term Operations and Maintenance plan will be developed which will include mowing and routine inspections of the consolidation cell, with repairs conducted as needed to ensure long-term effectiveness of the remedy.

RECOMMENDATION: On the basis of information available in the Administrative Record and summarized above, KDHE recommends implementation of the proposed remedial plan.

COMMUNITY INVOLVEMENT: Multiple stakeholder meetings have been held to solicit input on encapsulation cell placement within the proposed remedy. Public notice of the availability of the Draft Agency Decision Statement (ADS) will be published in the *Galena Sentinel-Times* on August 8, 2012, and the Draft ADS will be available for review at Galena City Hall from August 8 through August 23, 2012 during the 15-day comment period held to solicit public written comments for the proposed remedy. KDHE will present information regarding the proposed cleanup during the August 13th 2012 City Council Meeting at 6:00 p.m. in the Chamber of the Galena Municipal Building, located at 211 West 7th Street in Galena, Kansas. KDHE personnel will be available immediately following the presentation to answer questions. All documents related to the Eagle Picher site will also be available for review at the KDHE offices in Topeka, Kansas during the public comment period. To review documents in Topeka, please contact Maura O'Halloran at 785-296-0268. In addition, KDHE has established a webpage dedicated to the Eagle Picher site, available online at http://www.kdheks.gov/remedial/site_restoration/eagle_picher.html. Many site documents, including the Draft ADS, are available on the webpage. Public comments on the Draft ADS may be submitted to KDHE in writing during the 15-day public comment period at the address listed below.

Kansas Department of Health and Environment
Bureau of Environmental Remediation
1000 SW Jackson Street, Suite 410
Topeka, KS 66612
Contact – Maura O'Halloran, Site Restoration Unit
Phone: 785-296-0268

Comments on the Draft ADS may also be submitted to KDHE by electronic mail to mohalloran@kdheks.gov. Comments sent by electronic mail must be received by KDHE by 5:00 p.m. on August 23, 2012. Through this process, the general public and other interested parties are given the requisite opportunity to provide input on the proposed corrective action strategy for the site before the Agency Decision Statement is finalized.

TABLES:
Table 1 – Contaminant Concentrations in Soil
Table 2 – Contaminant Concentrations in Sediment
Table 3 – Contaminant Concentrations in Surface Water

FIGURES:
Figure 1 – Site Location Map
Figure 2 – Excavation Plan Map
Figure 3 – Consolidation Cell Location Map

FINAL AGENCY APPROVAL:

Gary Blackburn, LG
Director, Bureau of Environmental Remediation
Date: 8/7/12

Rick Bean, LG
Remedial Section Chief
Date: 8/6/12

Chris Carey, LG
Site Restoration Unit Manager
Date: 8/3/12

Maura O'Halloran, LG
Site Project Manager
Date: 8/3/12

TABLE 1: CONTAMINANT CONCENTRATIONS IN SOIL

Contaminant of Concern	Non-Residential Tier 2 Level Soil Pathway (mg/kg)*	Maximum Concentration Detected (mg/kg)
Arsenic	38	**1,520**
Cadmium	965	**7,180**
Lead	1,000	**58,800**
Mercury	20	**9,050**
Zinc	613,000	193,000

**KDHE's Risk Based Standards for Kansas (RSK) Manual, October, 2010.*
Bold Font indicates concentration exceeds specified threshold level, laboratory analysis only
mg/kg = milligrams per kilogram

TABLE 2: CONTAMINANT CONCENTRATIONS IN SEDIMENT

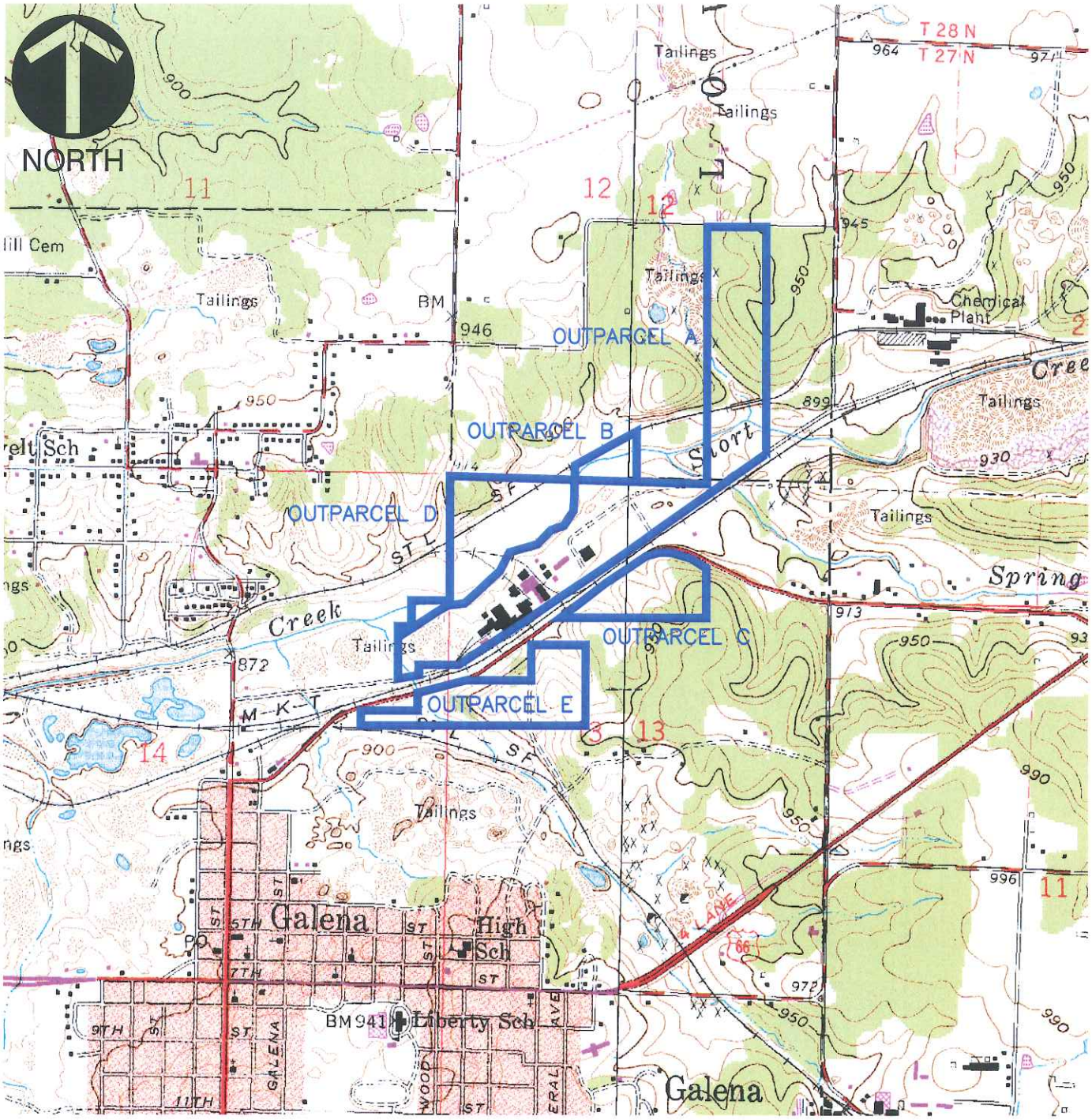
Contaminant of Concern	Tri-County PECs (mg/kg)	Maximum Concentration Detected (mg/kg)
Arsenic	33	**77.1**
Cadmium	4.98	**156**
Chromium	111	**115**
Lead	150	**66,400**
Mercury	1.0	**18.5**
Zinc	2,083	**32,400**

Bold Font indicates concentration exceeds specified threshold level, laboratory analysis only
mg/kg = milligrams per kilogram
PEC = Probable Effects Concentration

TABLE 3: CONTAMINANT CONCENTRATIONS IN SURFACE WATER

Contaminant of Concern	Acute Aquatic Life Criteria (µg/L)	Chronic Aquatic Life Criteria (µg/L)	Maximum Concentration Detected (µg/L)
Arsenic	340	150	<10
Cadmium	3.6	0.4	**49.3**
Chromium	NA	40	<5
Lead	158.6	6.1	**10.3**
Mercury	1.4	0.77	<0.2
Zinc	185	185	**3,690**

Bold Font indicates concentration exceeds specified threshold level
µg/L = micrograms per liter
NA = criterion not available



REFERENCE

USGS 7.5 MIN. TOPOGRAPHIC QUADRANGLE BAXTER SPRINGS, KANSAS, DATED 1999 AND JOPLIN WEST, MISSOURI, DATED 1982.

LEGEND

FORMER EAGLEPICHER SMELTER SITE

SCALE IN FEET

0 1500 3000

Civil & Environmental Consultants, Inc.

333 Baldwin Road - Pittsburgh, PA 15205

412-429-2324 · 800-365-2324

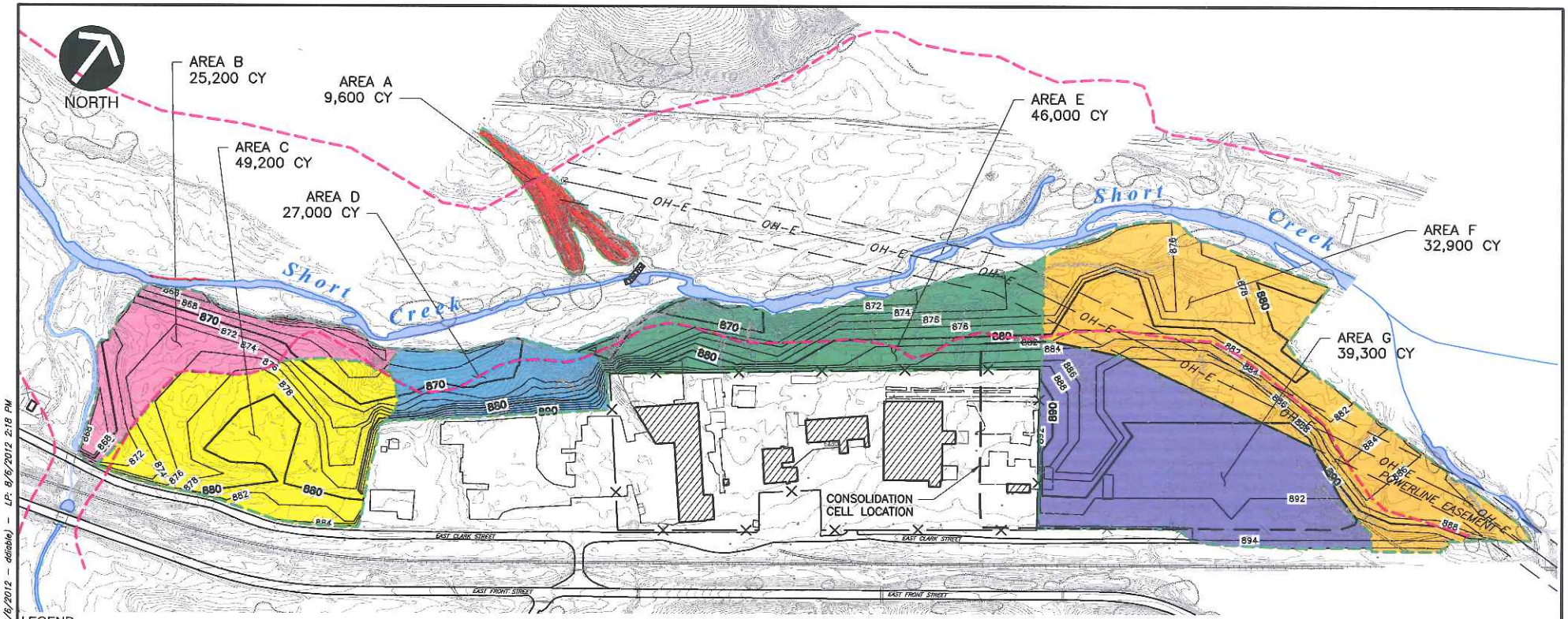
www.cecinc.com

FORMER EAGLEPICHER SMELTER SITE GALENA, KANSAS

SITE LOCATION MAP

DRAWN BY:	DWD	CHECKED BY:		APPROVED BY:		FIGURE NO.:	1
DATE:	10/5/10	DWG SCALE:	1"=1500'	PROJECT NO:	061-825		

G:\PROJECTS\2006\061-825\DWG\061825-SITE LOCATION MAP.DWG(FIGURE NO.1)LS:(DDIABLE — 7/30/2012) — LP: 8/3/2012 5:56:41 AM



LEGEND

- EXISTING PROPERTY LINE
- EXISTING FEMA 100-YR FLOOD PLAIN
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING EDGE OF CONCRETE
- EXISTING PAVED ROADWAY
- EXISTING UNPAVED DRIVEWAY
- EXISTING PAVED DRIVEWAY
- EXISTING FENCE
- EXISTING GUIDERAIL
- 880 PROPOSED EXCAVATION INDEX CONTOUR
- 888 PROPOSED EXCAVATION INTERMEDIATE CONTOUR
- PROPOSED LIMIT OF EXCAVATION

REFERENCE:

EXISTING TOPOGRAPHY PREPARED BY TRI-STATE ENGINEERING, INC., 1102 W. 9TH STREET, JOPLIN, MO 64801, PHONE: (417) 781-0643, DATE OF PHOTOGRAPHY: 12-14-2006, CONTOUR INTERVAL: 1', SCALE:1"=50'

SCALE IN FEET

0 250 500

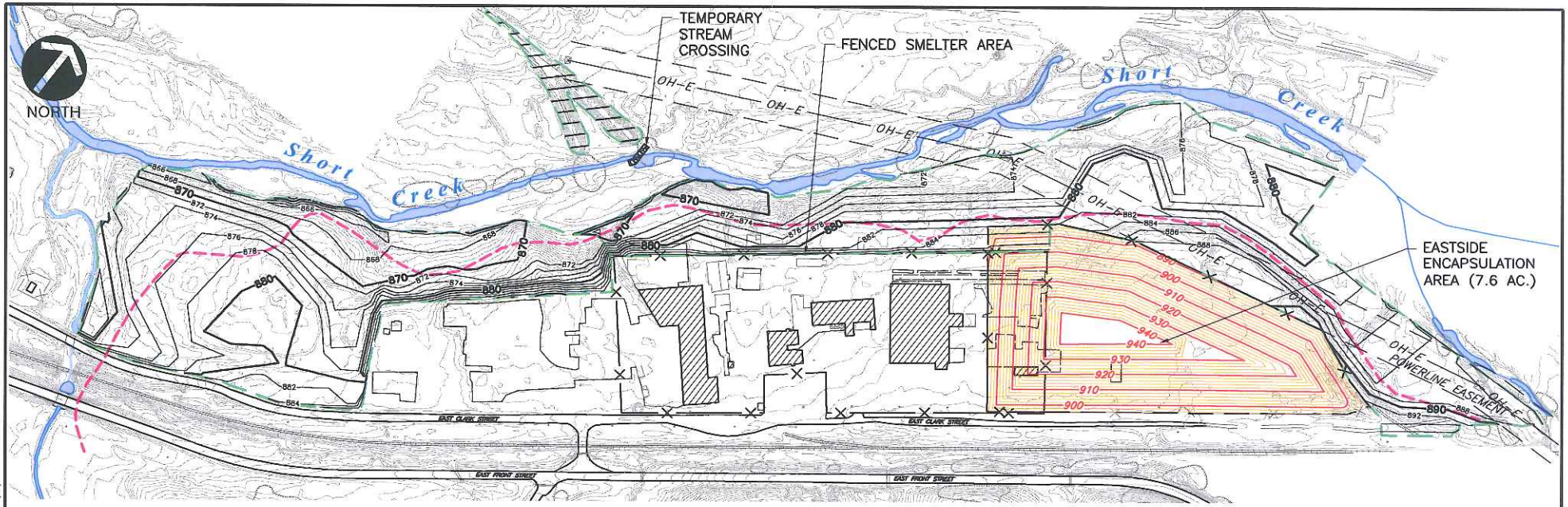
Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

EAGLE PICHER CUSTODIAL TRUST
CLEANUP ACTION WORK PLAN OPTIONS
FORMER EAGLE PICHER SMELTER SITE
GALENA, KANSAS

EXCAVATION PLAN

DRAWN BY:	DWD	CHECKED BY:		APPROVED BY:		DRAWING NO.:
DATE:	8/6/2012	DWG SCALE:	AS SHOWN	PROJECT NO:	061-825	2

G:\Projects\2006\061-825\dwg\SP19 2-11\061825-SP05-1.dwg[FIGURE 2] LS:(8/6/2012 - default) - LP: 8/6/2012 2:18 PM



LEGEND

- EXISTING PROPERTY LINE
- EXISTING FEMA 100-YR FLOOD PLAIN
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING EDGE OF CONCRETE
- EXISTING PAVED ROADWAY
- EXISTING UNPAVED DRIVEWAY
- EXISTING PAVED DRIVEWAY
- EXISTING FENCE
- EXISTING GUIDERAIL
- PROPOSED EXCAVATION INDEX CONTOUR
- PROPOSED EXCAVATION INTERMEDIATE CONTOUR
- PROPOSED EXCAVATION LIMIT
- PROPOSED WASTE INDEX CONTOUR
- PROPOSED WASTE INTERMEDIATE CONTOUR

NOTES:

1. SUPPLY & INSTALL APPROX. 4,000 LF OF SILT FENCE ALONG THE BANK OF THE STREAM.
2. SUPPLY & INSTALL GEOTEXTILE & GRAVEL FOR THE TEMPORARY STREAM CROSSING.
3. SUPPLY & INSTALL 6-INCH GRAVEL REMEDIATION COVER WITHIN FENCED SMELTER AREA.
4. EXCAVATE AND LONG-HAUL 157,000 CY OF CONTAMINATED SOIL (AREAS A, B, C, D & E) AND MOVE TO THE EASTSIDE ENCAPSULATION AREA.
5. EXCAVATE AND SHORT-HAUL 32,900 CY OF CONTAMINATED SOIL (AREA F) AND MOVE TO THE EASTSIDE ENCAPSULATION AREA.
6. REMOVE MERCURY CONTAMINATION FROM STREAM LOCATIONS.
7. SUPPLY & INSTALL 372,400 SF (7.6 AC) OF 40 MIL HDPE GEOMEMBRANE & DOUBLE-SIDED COMPOSITE OVER THE EASTSIDE ENCAPSULATION AREA.
8. SUPPLY & INSTALL 300 LF x 15 FT OF RIPRAP FOR DOWNCHUTES ON THE EASTSIDE ENCAPSULATION AREA.
9. SUPPLY 31,750 CY OF OFF-SITE SOIL.
10. PLACE 27,600 CY OF OFF-SITE SOIL ON THE EASTSIDE ENCAPSULATION AREA.
11. PLACE 4,150 CY OF OFF-SITE SOIL AS ENCAPSULATION ON MERCURY PONDS.
12. INSTALL 1800 LF OF FENCE AROUND THE EASTSIDE ENCAPSULATION AREA.
13. SUPPLY & INSTALL 3,000 LF x 15 FT OF CREEK BANK STABILIZATION.
14. SUPPLY & INSTALL 33.7 ACRES OF DIRECT SEED & MULCH.
15. SEE DWG. 1 FOR EXCAVATION PLAN.

ALL QUANTITIES PRESENTED HERE ARE ESTIMATED AND WILL BE REVISED BASED ON ACTUAL NUMBERS DETERMINED DURING FIELD ACTIVITIES.

DRAFT

SCALE IN FEET

0 250 500

REFERENCE:

EXISTING TOPOGRAPHY PREPARED BY TRI-STATE ENGINEERING, INC., 1102 W. 9TH STREET, JOPLIN, MO 64801, PHONE: (417) 781-0643, DATE OF PHOTOGRAPHY: 12-14-2006, CONTOUR INTERVAL: 1', SCALE:1"=50'

Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
412-429-2324 - 800-365-2324
www.cecinc.com

EAGLE PICHER CUSTODIAL TRUST
CLEANUP ACTION WORK PLAN OPTIONS
FORMER EAGLE PICHER SMELTER SITE
GALENA, KANSAS

OPTION B
EASTSIDE ENCAPSULATION AREA

DRAWN BY:	CHECKED BY:	APPROVED BY:	DRAWING NO.
DATE: JUNE 2012	DWG SCALE: AS SHOWN	PROJECT NO: 061-825	3

G:\Projects\2006\061-825\dwg\SP19 2-11\SP02 Option B.dwg[SP02-1] LS:(6/30/2012 - dsykes) - LP: 7/5/2012 1:34 PM