UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 04 2014

REPLY TO THE ATTENTION OF:

MEMORANDUM

SUBJECT: Draft No Further Action Memo for B & B Transfer of Monroe Co.

FROM: Joseph Kelly, Project Manager
Corrective Action Section 1 9/3/14

THRU: Don Heller, Acting Chief
Corrective Action Section 1

TO: Jose G. Cisneros, Chief
Remediation and Reuse Branch

Attached is a draft No Further Action Memo for the B & B Transfer site. This site is a former quarry subject to Corrective Action site as a result of illegal fly dumping of hazardous waste in piles. The site was not permitted, and the area was addressed by closure through the State to industrial/commercial standards with a deed restriction. All of the information for this site was obtained from IDEM's virtual records. I reviewed inspection records and follow up inspections, copies of the Agreed Order, and approval letters from IDEM. There was no PA/VSI completed as this was not a priority site. State inspections found no other areas of concern that were required to be addressed under RCRA, and the site was vacant an overgrown at the time of my inspection in 2011. The site does not appear to be in an area that meets the minimum screening criteria to qualify as an Environmental Justice area. A draft Statement of Basis was provided to Vic Windel and Mike Sickels of IDEM, but the letter was revised to a NFA after their review, and the current draft incorporates their comments. Mike Beedle signed off on the letter as Acting, but requested that tables be added/revised. The document was then revised to add your comments.

Determination of No Further Action

B & B Transfer of Monroe County
Dillman Road (approximately 570 East)
Bloomington, Indiana

IND 112 661 020

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

August 2014

B & B Transfer of Monroe County
Dillman Road (approximately 570 East)
Bloomington, Indiana
EPA ID #: IND 112 661 020

INTRODUCTION

This document for the B & B Transfer of Monroe County site (B & B Transfer), located at approximately 570 East Dillman Road, Bloomington, IN and hereinafter referred to as "Facility" or "Site", explains the basis for the United States Environmental Protection Agency's (EPA's) determination that no further action is required for this Facility.

This document summarizes information that can be found in greater detail in the September 6, 2001 *Settlement Agreement, Release, and Agreed Order, Cause No. 53C03-9809-MI-1270*, October 25, 2001 *RCRA Closure Plan*, November 27, 2001 *Closure Plan, Notice of Deficiency*, March 31, 2008 *Proposed Closure Work Scope*, May 9, 2008 *Proposed Closure Work Scope (Response)*, August 20, 2008 *Closure Certification Report*, October 24, 2008 *Closure Certification Report (Response)*, June 10, 2010 *Environmental Restrictive Covenant for B & B Transfer*, and July 15, 2010 *Closure Certification of Waste Piles*, and other documents in the site file for the B & B Transfer site, which can be found in the EPA Records Center, 77 West Jackson Blvd., 7th Floor, Chicago, Illinois.

DETERMINATION

EPA has made a determination that no further action by the federal RCRA corrective action program is required at the B & B Transfer site at this time.

FACILITY BACKGROUND

Location

B & B Transfer is a vacant, approximately 40 acre site located ¾ of a mile east of Old State Road 37 on the north side of Dillman Road (near 570 East Dillman Road) in Monroe County, south of the City of Bloomington, Indiana. The site is located in a rural area and is surrounded primarily by residential and agricultural areas. Residential properties are located immediately west of the site and immediately south of Dillman Road to the south of the site; to the east of the site is a separate portion of the former quarry that is not part of the B & B Transfer site, in addition to commercial properties (Pelham Training and RAK Cabinet and Surface Solutions) and a recently redeveloped residential area; farmland and residential properties are to the north of the site (see Figure 1).

There are no buildings on the site and no commercial or industrial activity currently occurs at the site. Access to the site is unrestricted and there is evidence of foot traffic by hunters. The site entrance/access drive is secured with a chain and lock to limit vehicular access to the property through the former entrance, and a portion of the eastern boundary of the site is fenced along the shared boundary with an adjacent residential subdivision. The site is heavily overgrown and forested, with the exception of the area that was previously cleared to complete remediation activities, and an industrial/commercial deed restriction is maintained on approximately two-acres of the B & B Transfer site as a result of the prior cleanup.

History

The site contains approximately 40 acres of land that was utilized by Indiana Limestone as a quarry until approximately 1960. The site was purchased by the current owners, B & B Transfer, in the early 1980's with the intention of redeveloping the site. B & B Transfer has never conducted operations at the site, which has been vacant since the time preceding the purchase, but has been used as a dump for (solid) construction debris in the past. A March 1989 inspection by the Indiana Department for Environmental Management (IDEM) identified the presence of several illegal hazardous waste disposal areas (waste piles) resulting from fly-dumping (illegal dumping of wastes on public or private property) in the southern part of the site.

Waste Generation and Management History

Based on an inspection of the B & B Transfer site conducted by the Indiana Department of Environmental Management (IDEM) in March 1989 and samples analyzed by IDEM, hazardous waste containing lead and cadmium was identified on the property. The inspection was performed in response to a complaint regarding the potential disposal of hazardous waste from a nearby property that was undergoing decommissioning (Reclamation Contractors of Indiana-RCI). At that time, an open dump area (construction material and waste soil piles of foundry sand containing hazardous concentrations of lead and aluminum shavings) was identified on the B & B Transfer site. The identified wastes were staged in waste piles on the south side of the site adjacent to a low-lying pond where the quarry pit was located. The land surface in that area sloped towards the pond located 100 feet north of the piles, which received drainage from the waste disposal areas. These areas comprised a RCRA Hazardous Waste Pile area, which is identified as Solid Waste Management Unit (SWMU) 1.

The 1989 inspection by IDEM revealed the potential disposal of hazardous waste from the nearby RCI site at the B & B Transfer site. B & B Transfer did not notify IDEM that hazardous wastes were being disposed at the Site and never applied for a RCRA permit. As a result of the illegal onsite hazardous waste disposal, the B & B Transfer site became subject to RCRA, and

IDEM issued a notice of violation (NOV), cause No. H-138, to the facility on October 18, 1990 based on the March 1989 inspection.

Subsequent to IDEM's issuance of the NOV, B & B Transfer and IDEM entered into a *Settlement Agreement, Release, and Agreed Order, Cause No.53C03-9809-MI-1270*, dated September 6, 2001, to address the illegal hazardous waste disposal. The Order required B & B Transfer to submit a RCRA Closure Plan for six Hazardous Waste Piles in the southern portion of the site. IDEM initially informed B&B Transfer, by letter dated November 26, 2001, that its *RCRA Closure Plan*, dated October 25, 2001 was deficient. A subsequent *Proposed Closure Scope of Work*, dated March 31, 2008 was approved by IDEM on May 9, 2008 following revisions to the cleanup objectives, and a revised *Settlement Agreement, Release, and Agreed Order*, dated August 2006.

B & B Transfer initiated a soil investigation at the site in 2001 in the area where illegal waste disposal was observed during the March 1989 IDEM inspection. B & B Transfer later completed an industrial clean closure of the waste areas by removing lead impacted solid wastes beginning in 2006. Additional detail on the investigation and closure of the former hazardous waste pile area is provided below in the discussion of SWMU 1.

Aside from the closure of the former hazardous waste pile area completed through 2010, no further RCRA Corrective Action has taken place at the Facility.

A representative of the EPA's corrective action program made a site visit in September 2011 to meet with the site owner and observe the conditions at the site, which had not changed significantly since the time of the cleanup. The site is an undeveloped, wooded area with dense vegetation. The entrance to the area of the prior cleanup is secured with a chain to prevent vehicles from accessing the site. The areas of the prior cleanup were observed as low lying areas where brush had been removed and low spots in the ground surface had collected small amounts of rainwater. Remaining areas of the site surrounding the former cleanup area contained mature trees and dense underbrush. No activity currently occurs at the site, and the site owner is not actively generating or managing hazardous waste under RCRA.

Geologic and Hydrogeologic Setting

The site geology is characterized by a thin surface cover (< 50 ft.) of soil augmented with fill materials, primarily rock and/or concrete, followed by relatively shallow, Mississippian-aged, limestone bedrock. A small pond is located adjacent to the site on its western boundary, and the central and southern portions of the site were reworked as a result of the former quarrying operations.

A groundwater investigation was not performed in connection with site assessment activities because the closure activities mitigated the potential for contamination to migrate to groundwater. However, the water elevation in the adjacent pond mirrors the water elevation in the former on-site quarry pond, and other ponds throughout the surrounding area. It is anticipated that the water level in the ponds mirrors the level of the shallow groundwater surface, which is anticipated to be present near the contact with the bedrock surface. The water table is anticipated to be found at approximately 10 to 15 feet below the surface, and groundwater flow is anticipated to mimic regional surface topography, which generally drains to the west. Groundwater was reportedly present at a depth of 15 feet and bedrock was present at a depth of 11 feet on the well log for the closest reported well, located on the east adjacent site.

Ecological Setting

The ground surface at the B & B Transfer site is partially disturbed and covered with gravel and native soil. Vegetation at the site is primarily coarse native grass, dense growth of small deciduous trees, tall weeds, and invasive and opportunistic herbaceous and woody plants. In general, the on-site habitats have been influenced by historical land use and there are no permanent aquatic habitats on-site.

The only endangered species listed for the county by the U.S. Fish and Wildlife Service is the Indiana Bat. Per the U.S. Fish and Wildlife Service, the Indiana Bat inhabits caves and mines, and roosts in certain trees that may be present in the area of the site. After hibernation, Indiana bats migrate to their summer habitat in wooded areas where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females roost in larger groups of up to 100 bats or more. Indiana bats also forage in or along the edges of forested areas.

Since the corrective action work has already been completed at the site, and the results of the SWMU 1 closure investigations indicate that ecological risks from site contaminants are negligible, there is no need for ongoing evaluation of this endangered species in connection with these activities. However, should additional work at the site be required in the future, efforts should be made to coordinate with the U.S. Fish and Wildlife Service to ensure the protection of potentially sensitive habitats.

Investigation Results

SWMU 1 – Former Hazardous Waste Piles Area

Description and Release History

This SWMU is the only solid waste management unit on the site and encompasses the former hazardous waste piles area in the southern portion of the site. The area was used for the illegal disposal of D008 (lead) hazardous wastes at the Facility (see Figure 2).

Release Control, Response Actions, and Environmental Data

B & B Transfer originally contracted with Earth Tech to complete closure as outlined in IDEM's 2001 Agreed Order. Sampling performed on behalf of the site owner in August 2001 revealed total lead ranging from 14 parts per million (ppm) to 990 ppm, with maximum TCLP lead concentrations ranging from 0.26 ppm to 0.42 ppm at one waste pile, and TCLP lead concentrations "non-detect" in 11 of the 14 samples from the five remaining waste piles (see Figure 3). Total cadmium ranged from 3 ppm to 56 ppm, with TCLP cadmium detected at a maximum concentration of 0.13 ppm, and "non-detect" in four samples. Total/dissolved lead and cadmium were <0.005 ppm and <0.002 ppm, respectively, in the surface water sample collected adjacent to the waste pile area. These results show that the levels of lead and cadmium in the soil at the B & B Transfer property were one order of magnitude below the concentrations that define a hazardous waste and total lead was below the IDEM's cleanup objective of 1,300 mg/kg for industrial properties at that time; however, IDEM instructed B & B Transfer to conduct removal actions to address the high levels of total lead in the waste pile samples and earlier hazardous TCLP lead results obtained by IDEM after the initial inspection.

In 2006, B & B Transfer contracted Kermida Environmental, Inc. to complete activities outlined under a revised August 2006 Agreed Order. Kermida oversaw the remediation of the waste piles in October 2006, resulting in the disposal of several waste containers (drums and tubs), and 929 tons of TCLP-lead hazardous waste pile material. Kermida conducted confirmation sampling of the waste pile area in November 2007 which revealed that additional non-hazardous total lead impacts were still present in the shallow soils in isolated areas. In March 2008, the owner submitted a proposed scope of work for closure to IDEM to address residual lead as the only remaining contaminant of concern based on the 2007 sampling results. IDEM approved the proposed scope of work in May 2008, resulting in a June 2008, Addendum to the Agreed Order for the remaining activities. In July 2008, Kermida oversaw the removal of an additional 142 tons of non-

hazardous lead impacted soil. Kermida submitted a *Closure Certification Report*, dated August 20, 2008, outlining the cumulative results of remediation activities.

Results

Analytical results from samples collected following cleanup revealed that total lead concentrations were below the default Industrial Risk-Based Closure Level (IRBCL) of 230 ppm, as established in IDEM's RISC Guidance, in all of the confirmation samples with one exception; one sample from the surface/sidewall of one of the former excavations contained total lead at a concentration of 300 ppm. In addition, none of the lead concentrations exceeded the EPA's most-stringent Regional Screening Levels (RSL Summary Table, November 2011). A Potential Exposure Concentration (PEC) was calculated from the cumulative data using statistical methods, and a PCE of 98 mg/kg was calculated for the site. Since the PEC was less than the IRBCL, IDEM approved the closure certification in October 2008. Since the site did not attain residential cleanup standards, an environmental covenant (EC) was used for the 2-acre portion of the former cleanup site to manage the residual impacts. The EC prohibits the residential or agricultural use of the property, prohibits the use of on-site ground water for potable (i.e., drinking water) purposes, and requires that necessary precautions be taken to prohibit the disturbance of soil without prior notification to IDEM. The environmental restrictive covenant was signed on May 18, 2010 and returned to IDEM on June 10, 2010.

No groundwater monitoring wells have been installed at the site; however, analytical results indicate that the PEC was less than the default IRBCL of 230 ppm (a concentration of total lead that is also protective of the potential to leach from soil to industrial/commercial groundwater). With the exception of initial TCLP lead samples collected by IDEM following the inspection, analytical results for TCLP lead were low even before remediation. A sample of surface water collected from the pond located adjacent to the former waste pile also revealed that lead and cadmium were "non-detected" at the standard detection limits. Based on these factors, EPA believes groundwater is not anticipated to be impacted at the site; however, a potable groundwater use restriction was implemented in the environmental covenant to limit groundwater use to industrial purposes.

A comparison of selected soil and groundwater cleanup objectives from state guidance and EPA Regional Screening Levels (RSLs) is provided on the next page for comparison with the aforementioned results.

Industrial soil cleanup levels for total lead, in milligram per kilogram (mg/kg-ppm) are:

	Post-Cleanup Levels	Calculated PEC	EPA RSL	IDEM IRBCL
Lead	12-300 ppm	98 ppm	800 ppm	230 ppm

For ground water, the screening levels, in parts per billion or micrograms per liter (ug/L-ppb) are:

	Detected levels	MCL
Lead	< 5 ppb	15 ppb

Analytical data tables for soil and water samples collected during investigation and closure are shown in Attachments A and B.

The waste piles on the subject property were the only known RCRA regulated units on this vacant former quarry. Analytical testing completed following remediation was used to calculate a PEC for residual lead; the PEC was below the default IRBCL and IDEM issued a *Closure Certification* letter in July 2010, as confirmation that cleanup of the SWMU was complete. The closure certification relied on the use of an Environmental Covenant to restrict the property use and manage residual lead impacts, and EPA verified on May 21, 2014 with the Monroe County Recorder's Office that the EC for the former SWMU had been recorded against the deed for the property.

SUMMARY OF FACILITY RISKS

Human Health Risks

Based on the available information cited above, the former hazardous waste pile area was approved as closed by IDEM in 2010. No contaminants of concern were found to exceed the IDEM RISC guidance industrial default closure levels for soil and groundwater during investigation. An Environmental Covenant is in place, and serves as an effective mechanism to prohibit the residential or agricultural use of the property, prohibit the use of on-site ground water for potable (i.e., drinking water) purposes, and ensure that necessary precautions will be taken to prohibit the disturbance of soil without prior notification to IDEM for a 2-acre portion of the site to manage the residual impacts in the area of the former SWMU. Given that the impacted soil has been removed, institutional controls are in-place to address residual contamination, and there were no impacts in the water, exposures to hazardous constituents previously disposed at

the B & B Transfer site are under control and do not pose a threat to human health under current conditions.

Ecological Risks

EPA evaluated the potential risks to organisms by residual soil contamination at the facility. The measured concentrations of lead in the soil were compared with the two lowest soil screening values for lead from the EPA ecological soil screening level (Eco-SSL) report. Levels of 11 mg/kg for avian receptors and 56 mg/kg for mammalian receptors were reported as benchmarks. This comparison showed that 12 samples exceeded both the background and avian benchmark, and eight samples exceeded the mammalian benchmark. However, the area of residual contamination is relatively small compared to the home ranges for the species common to the study area (Northern short-tailed shrew and American woodcock). The home range of the northern short-tailed shrew is approximately 1.25 acres and the area of residual lead for the eight samples above the Eco-SSL is estimated to be about 1,500 square feet, representing less than 3% of the shrew's home range (exposure area). The home range of the American woodcock is approximately 80 acres and the area of residual lead for the 12 samples above the Eco-SSL is estimated to be about 2,300 ft^2, representing less than 0.066% of the woodcock's home range (exposure area). Therefore, corrective measures are not warranted to reduce the concentrations of lead at the SWMU 1 area, given that the remaining lead concentration levels resulting from closure activities pose a low and acceptable risk to both mammalian and avian receptors. Based on the available information cited above, there is adequate information to conclude that ecological risks are negligible at the Site.

SCOPE OF CORRECTIVE ACTION

The intention of corrective measures is to eliminate the threat of exposures by meeting the following objectives:

- Remediating contamination which presents a risk to human health or the environment, or eliminating the pathways of exposure to such contaminants;
- Appropriately managing any residual wastes disposed on-site such that they do not present a risk to human health or the environment, and
- Protecting sensitive ecosystems.

Performance Standards for Corrective Measures

Remedial alternatives must meet three performance standards, which are the main objectives of a corrective action program under the RCRA.

1. Protect human health and the environment;

2. Achieve media cleanup objectives, and

3. Remediate the sources of releases.

CONCLUSION

Based upon the information presented in this document and in the Administrative Record regarding releases and remedial actions performed at this Site to address those releases, EPA has determined that no further action by the federal RCRA corrective action program is necessary at this Site at this time. The site conditions were assessed against the objectives for eliminating threats from a site named above and EPA believes that the management of the site has met those objectives. After review of the efforts undertaken at the site by B & B Transfer that were approved by IDEM, EPA believes that the cleanup of the site was effective and met the three performance standards listed above.

The Facility completed remediation of the waste management area in 2010. The documentation from the 1989-2010 remediation work demonstrates that the Site has already achieved appropriate risk reduction, prevented the migration of contaminants, and eliminated the threat of exposure, based on the conditions established and confirmed by IDEM in 2010 during the closure of the Former Hazardous Waste Pile Area. The former SWMU does not present concern for human health and the environment under the current conditions. EPA believes the Site has achieved a CA070NO (no further investigation needed), CA400 (remedy decision), CA550-NR (remedy construction complete-no remedy) CA 900 CR (Controls Required)." EPA reserves the right to change, modify or otherwise rescind this determination based on new information or information not available to EPA at the time of this determination.

Name	Title	Signature	Date
Joseph Kelly	Project Manager		7/28/14
Susan Perdomo	Regional Counsel		7/29/14
Don Heller	Supervisor (Acting)		7-29-14
Jose Cisneros	Branch Chief		9/4/14

Figure 1

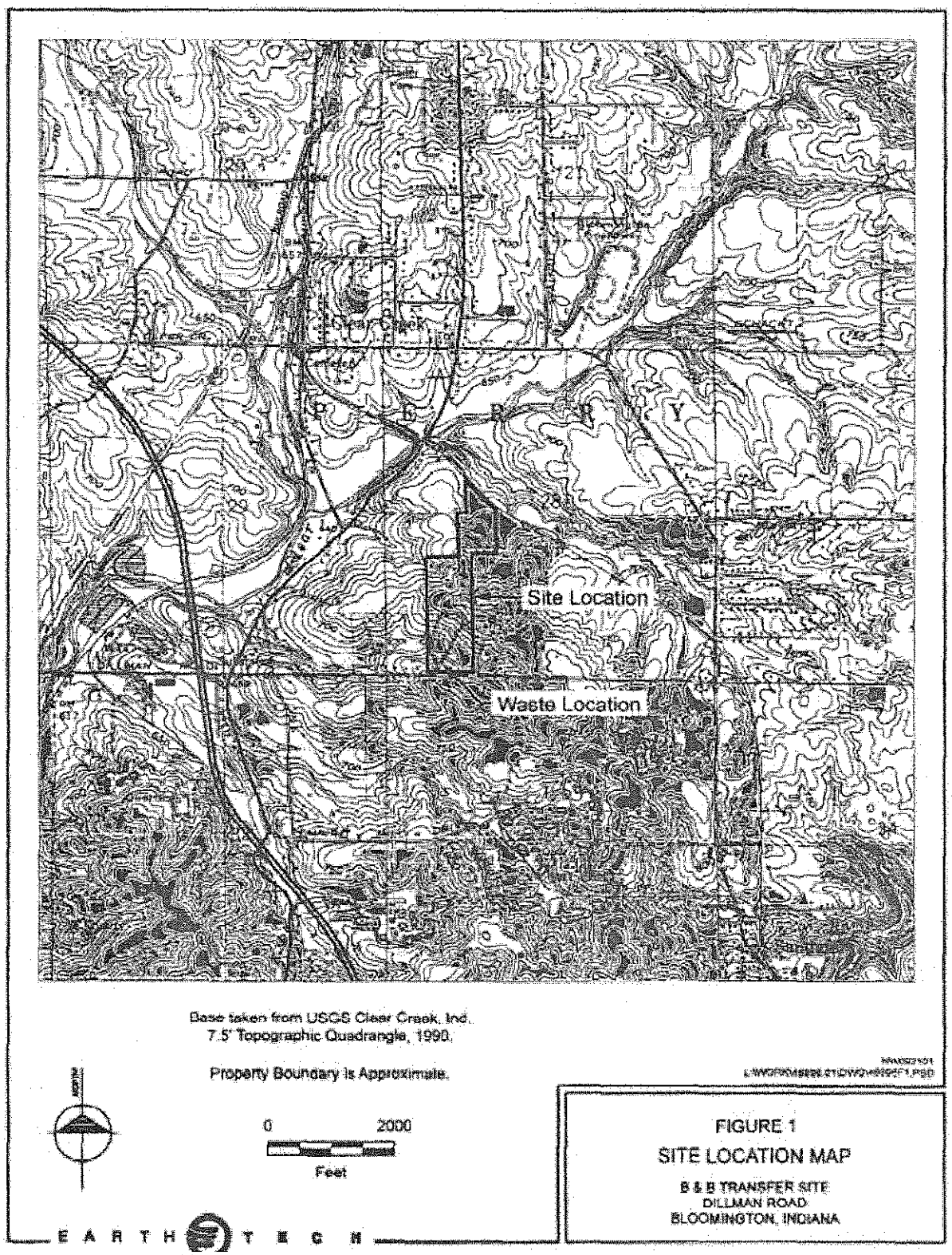


Figure 2

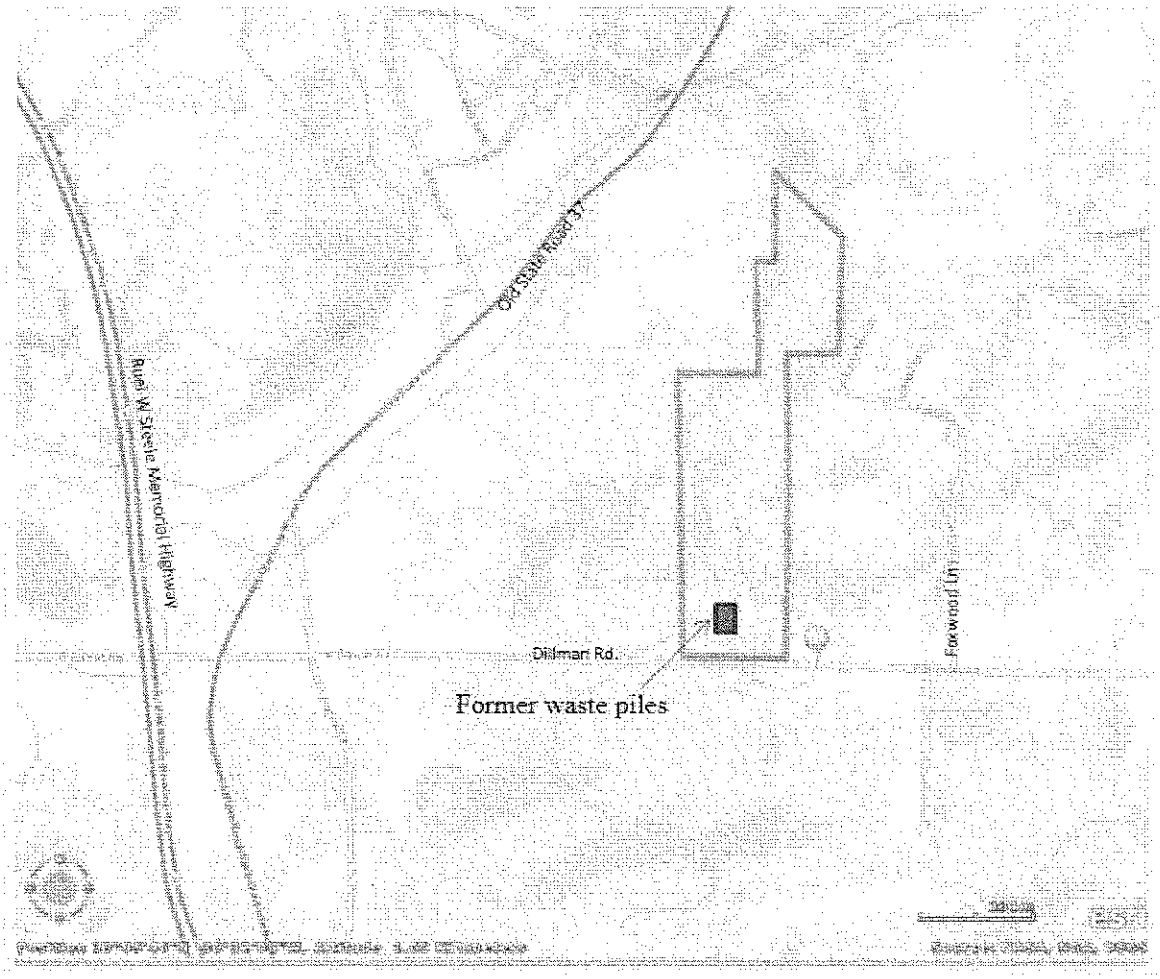
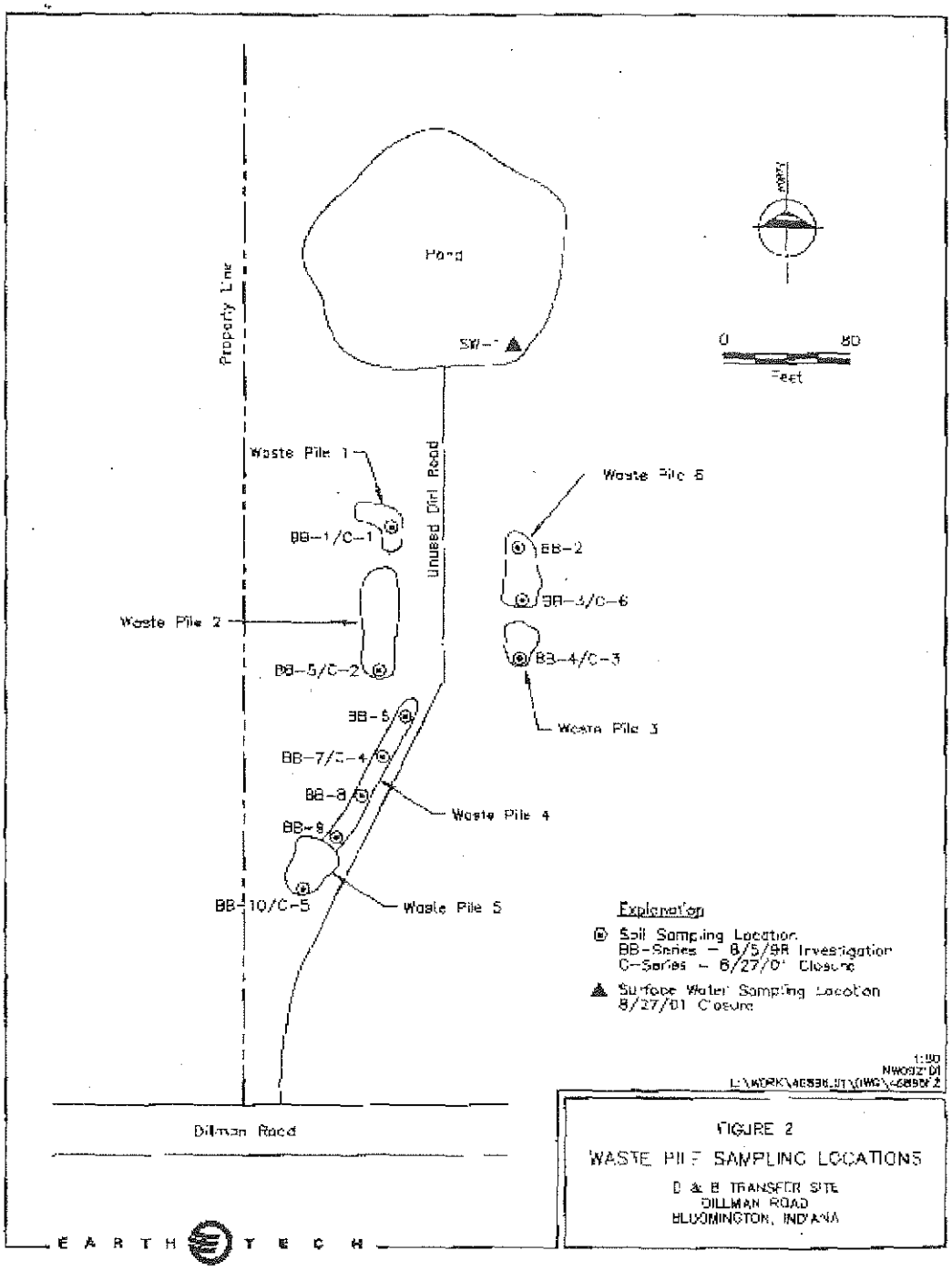


Figure 2: B&B Transfer Property and former hazardous waste pile location

Figure 3



Attachment A – Final Soil Results

Total Lead Analytical Results (mg/kg)
B and B Transfer
Bloomington, Indiana
KERAMIDA Project No. 10841

Sample ID	Date	Sample Depth (feet)	Lab Sample ID	Total Lead
KC-1	11/27/2007	7	A818233	34
KC-1 DUP	11/27/2007	7	A818234	38
KC-2	11/27/2007	5-6	A818235	20
KC-3	11/27/2007	0.5-1	A818236	18
KC-4	11/27/2007	5-6	A818237	7
KC-5	11/27/2007	0.5-1	A818238	34
KC-6	11/27/2007	5-6	A818239	8
KC-7	11/27/2007	0.5-1	A818240	**100**
KC-8	11/27/2007	5-6	A818241	6
KC-9	11/27/2007	0.5-1	A818242	**130**
KC-10	11/27/2007	2.5	A818243	42
KC-11	11/27/2007	0.5-1	A818244	**130**
KC-12	11/27/2007	0.5-1	A818245	**360**
KC-13	11/27/2007	0.5-1	A818246	**230**
KC-14	11/27/2007	0.5-1	A818247	51
KC-14 DUP	7/18/2008	0.5-1	A818248	44
KC-15	7/18/2008	2	A818249	12
KC-16	7/18/2008	0.5-1	A818250	33
KC-17	7/18/2008	0.5-1	A818251	67
KC-18	7/18/2008	0.5-1	A818252	21
KC-19	7/18/2008	0.5-1	A818253	30
KC-20	7/18/2008	2	A818254	5
KC-20 DUP	7/18/2008	2	A818255	61
KC-21	7/18/2008	0.5-1	A818256	**220**
KC-22	7/18/2008	0.5-1	A818257	7
KC-23	7/18/2008	0.5-1	A818258	37
KC-24	7/18/2008	0.5-1	A818259	22
KC-25	7/18/2008	2	A818260	24
KC-26	7/18/2008	0.5-1	A818261	5
KC-27	7/18/2008	0.5-1	A818262	30
KC-28	7/18/2008	0.5-1	A818263	6
KC-29	7/18/2008	0.5-1	A818264	4
RISC Default Closure Level - Residential[1]				81
RISC Default Closure Level - Industrial[1]				230
Site Specific Background Range				18-32

Samples analyzed using US EPA Method 6000/7000
mg/kg = milligrams per kilogram
[1] Indiana Department of Environmental Management RISC Technical Guide, Exp., February
Bolded values exceed Residential Closure Level

Table 2
PEC Worksheet
B and B Transfer
Bloomington, Indiana
KERAMIDA Project No. 10841

Sample ID	Total Lead
KB-5 (0-0.5')	13
KB-5 (1')	15
KB-6 (0.75')	23
KB-7 (0.5')	17
KB-9 (1')	79
KC-2	15
KC-3	34
KC-7	169
KC-9	130
KC-11	130
KC-12	309
KC-13	239
KC-14	51
KC-16	23
KC-17	67
KC-18	91
KC-19	23
KC-21	223
KC-22	17
KC-23	37
KC-24	22
KC-26	15
KC-27	23
KC-28	15
KC-29	14

Mean	65
Standard Dev	80
Sample count	21
Student's t value	1.725
PEC	98

All sample results from samples less than 1 foot below

Attachment B – Water Sample SW-1

Table 1
Analytical Results Summary
B&B Transfer Waste Pile Investigation and Closure

	Cadmium		Lead	
	TCLP (mg/L)	total (mg/Kg)	TCLP (mg/L)	total (mg/Kg)
Closure Level	[illegible]	780	[illegible]	230 (300)
Regulatory limit	1	[illegible]	5	[illegible]
Pile No. Sample ID				
Pile 1				
BB-1	0.13		0.42	990
C-1	0.14	56	0.39	950
C-1 DUP	0.07	39	0.26	940
Pile 2				
BB-5	<0.10		<0.16	50
C-2	<0.01	<1	0.06	240
Pile 3				
BB-4	<0.10		<0.16	200
C-3	<0.01	<1	<0.05	71
Pile 4				
BB-6	<0.10		<0.16	19
BB-7	0.01		<0.16	280
BB-8	0.099		<0.16	380
BB-9	0.026		<0.16	<40
C-4	0.01	3	0.06	250
Pile 5				
BB-10	0.052		<0.16	<40
C-5	0.07	25	0.19	580
Pile 6				
BB-2	0.011		<0.16	280
BB-3	<0.10		<0.16	26
C-6	<0.01	<1	<0.05	14

	Cadmium		Lead	
	total	dissolved	total	dissolved
	mg/L	mg/L	mg/L	mg/L
SW-1	<0.005	<0.002	<0.005	<0.002

Closure Level – IDEM RISC default Industrial Closure Level (February, 2011)
Regulatory Limit – TCLP limit for defining hazardous by characteristic
BB samples = Waste sample for investigation (Earth Tech, 1998)
C samples = Waste sample for closure (current)
SW sample = Surface water sample for closure (current)

[illegible]\Data\xls\2011

May 29, 2012

MEMORANDUM

TO: Joseph Kelly, Project Manager

FROM: Daniel Mazur, Ecologist

SUBJECT: B and B Transfer Property - Bloomington, Indiana
RCRA Closure and Site Visit Reports
Ecological Risk Assessment and Endangered Species Review

I reviewed the following reports to evaluate potential ecological risk and impact to endangered species following cleanup actions at B and B Transfer Property. Cleanup action by Indiana DEM was limited to management of human health risk and did not consider ecological risk or endangered species.

RCRA Closure Plan - October 25, 2001
Closure Certification Report - August 20, 2008
US EPA Site Visit - September 7, 2011

Lead in the waste piles were found hazardous based on toxicity characteristic leaching procedure (TCLP) analysis. Four other metals (barium, cadmium, chromium and nickel) were detected by IDEM, but not considered hazardous. Following removal of the waste piles, remaining surface soils (0.5-1 ft) were only evaluated for lead.

A screening ecological risk assessment of residual lead in soil used the two lowest soil screening values for lead from the US EPA ecological soil screening level (Eco-SSL) report (avian 11 mg/kg and mammal 56 mg/kg). All of the soil samples exceeded the lead benchmark for avian species and eight samples for mammals. Since EPA does not require cleanup below background, the ecological risk assessment focused on the eight samples exceeding the mammal benchmark and 12 samples exceeding both the background and avian benchmark. The soil screening benchmarks are listed in the Eco-SSL report for lead (table 2.1) at http://www.epa.gov/ecotox/ecossl/

The northern short-tailed shrew (*Blarina brevicauda*) was selected as a sensitive mammalian receptor for this site. A screening ecological risk assessment assumes a receptor, has 100% exposure to the contaminated media (i.e., residual lead in surface soil). Considering the home range (likely exposure area) of the northern short-tailed shrew is approximately 0.5 hectare (1.25 acres) and the residual lead area for the eight soil samples is estimated to be about 1,500 ft^2, this area with residual lead is less than 0.03 of the shrew's home range (exposure area). To protect a shrew, a lower and upper bound soil cleanup criteria for lead was calculated at 56 mg/kg and 733 mg/kg, respectively (see calculation data sheet below). Although there is some lead exposure, the low exposure area (< 3%) and low lead soil concentration (all samples are below the upper bound cleanup criteria) indicates very low and acceptable risk to the shrew.

The American woodcock (*Scolopax minor*) was selected as a sensitive avian receptor for this site. A screening ecological risk assessment assumes a receptor, has 100% exposure to the contaminated media (i.e., residual lead in surface soil). Considering the home range (likely exposure area) of the American woodcock is approximately 32.4 hectare (80 acres) and the residual lead area for the 12 soil samples is estimated to be about 2,300 ft^2, this area with residual lead is less than 0.00066 of the woodcock's home range (exposure area). To protect a woodcock, a lower and upper bound soil cleanup criteria for lead was calculated at 11.4 mg/kg and 192 mg/kg, respectively (see calculation data sheet below). Although there is some lead exposure, the low exposure area (< 0.066%) and low lead soil concentration (9 of 12 samples are below the upper bound cleanup criteria) indicates very low and acceptable risk to the woodcock.

While the Indiana Bat is a listed species in the county, exposure to lead from soil is unlikely or would be significantly less than the shrew. No additional site remediation is expected.

Without soil data, an evaluation of ecological risk from barium, cadmium, chromium and nickel was not possible. The small and fragmented exposure area (< 0.25 acre) and very low lead levels does not suggest a need to collect additional soil data for these four metals. If soil data was available, they would be compared to both the lowest Eco-SSLs (as shown below in bold font) and soil background levels.

	Plant	Invertebrate	Avian	Mammal
Barium	-------	**330**	------	2,000
Cadmium	32	140	0.77	**0.36**
$Chromium^{+3}$	-------	-------	**26**	34
$Chromium^{+6}$	-------	-------	------	130
Nickel	**38**	280	210	130

Soil cleanup criteria for lead to protect sensitive avian and mammal species

Both lower and upper bound soil concentrations (NOAEL and LOAEL) are provided for the American woodcock and northern short-tailed shrew. These data values came from the Eco-SSL report and LOAEL TRVs were developed by EPA Region 5.

	Woodcock		Shrew	
Parameters	**NOAEL**	**LOAEL**	**NOAEL**	**LOAEL**
HQ	1	1	1	1
Food Injestion Rate (FIR) g/gBW/day	0.214	0.142	0.209	0.176
Ps (proportion of soil consummed)	0.164	0.064	0.03	0.009
Invertebrate Concentration (Ci) (mg/kg)	5.73	56.0	20.7	165
TRV	1.63	9.7	4.7	30.2
HQ	0.998	0.999	0.99550	0.99999
Soil Concentration (PRG) (mg/kg)	**11.4**	**192**	**56**	**733**
HQ=FIR*(Soil conc*Ps+Ci)/TRV				
Ci - Exp(0.807 * ln(Cs) - 0.218)				