

*Transmitted Electronically*

September 26, 2007

Mr. Leonardo Ceron  
On-Scene Coordinator  
U.S. Environmental Protection Agency, Region 4  
Sam Nunn Atlanta Federal Center  
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**Subject: Final July 2007 Removal Site Evaluation Letter Report  
Lincoln Metals  
Lincoln, Talladega County, Alabama  
Contract No. EP-W-05-053  
Technical Direction Document (TDD) No.: TNA-05-003-0037**

Dear Mr. Ceron:

The T N & Associates, Inc. (TN&A), Superfund Technical Assessment and Response Team (START), has prepared this letter report detailing activities performed in support of the Lincoln Metals Removal Site Evaluation (RSE). All activities and procedures were performed in accordance with the Environmental Protection Agency (EPA) Science and Ecosystem Support Division (SESD) Region 4 *Environmental Investigation Standard Operating Procedures and Quality Assurance Manual* (EISOPQAM) and the EPA Region 4 Emergency Response and Removal Branch (ERRB) Quality Assurance Project Plan (QAPP).

The EPA Superfund Remedial and Site Evaluation Branch (RSEB) referred Lincoln Metals to the EPA ERRB for a RSE. Consequently, in May 2007, TN&A was tasked under EPA START contract Number (No.) EP-W-05-053, TDD No. TNA-05-003-0037, to conduct a field investigation at Lincoln Metals (the site) in support of the RSE. Specifically, START was tasked to provide written and photographic documentation of on-site conditions; screen the site soils for metals contamination using a portable X-Ray Fluorescence (XRF) instrument; and collect soil samples for laboratory analysis. Additionally, START was tasked with preparing and submitting a Letter Report to EPA summarizing activities performed at the site under this TDD.

Two separate sampling events (May 2007 and July 2007) were conducted by START in support of this TDD. The May 2007 field investigation focused on delineating surface soil contamination at the former Lincoln Metals foundry; drainage ditches bordering the former Lincoln Metals foundry; and adjacent residential and public properties. A Letter Report of findings from the May 2007 event was submitted under separate cover. The July 2007 field investigation focused on delineating subsurface soil contamination within the boundaries of the former Lincoln Metals foundry and the drainage ditch adjacent to the Norfolk Southern railroad tracks north of the former Lincoln Metals foundry; and investigated the surface soils from several residential properties not sampled during the May 2007 field investigation. This RSE Letter Report summarizes the July 2007 field investigation activities conducted by START and includes pertinent results and findings.

### **Site Background**

The site is comprised of the former Lincoln Metals brass foundry property and adjacent residential and community properties, including a public playground and baseball field. The former Lincoln Metals brass foundry is located at 248 Foundry Road in the City of Lincoln, Talladega County, Alabama. The central geographic coordinates of the site are 33° 36' 54" North latitude and 86° 06' 40" West longitude (Figure 1, Attachment A). The former Lincoln Metals property is located in a residential area and is bordered to the north by Railroad Avenue and the Norfolk Southern railroad line; to the south by residential homes; to the west by a small baseball field; and to the east by an undeveloped, partially wooded lot. Surface water flows across the property to the northwest, where it intersects a ditch that flows to the west along Railroad Avenue and the railroad line.

Little information is available regarding the operational history of the Lincoln Metals facility; however, previous investigations indicate that the property was operated as a brass foundry from 1990 through 1995. The facility is situated on a 1.73-acre tract of land that is entirely fenced. One building, approximately 20,909 square feet in area, occupies the northern portion of the property and a bag house is located on the north side of the building. The facility was built in 1947; however, the earliest evidence of operation found was dated 1956, when the company changed its name from Lincoln Metals & Chemical Company, Inc. to Lincoln Metals Co., Inc. During this time, the facility was operated by Mr. Fred C. Hahn.

In March 1972, Royal Brass Manufacturing Co. (Royal Brass) of Cleveland, Ohio bought Lincoln Metals Co. Inc., and it became known as Lincoln Metals Corporation. In 1999, Mr. Lou Moonshower bought into Lincoln Metals Corporation. In February of 2000, Heartland Faucet Company (Heartland Faucet) of Frankfort, Indiana, purchased the property from Royal Brass. Meanwhile, Mr. Hahn continued to be involved with the company and in January 2001, permit and ownership were transferred to the Heartland Faucet. In March 2001, Heartland Faucet declared bankruptcy. In November 2001, Silvercrown Investments, also owned by Lou Moonshower and Roger Swayer, purchased the company out of bankruptcy.

While the facility was operating as Heartland Faucet, the foundry produced brass faucet fittings using “enviro-brass” or “green brass”, which contains a low lead content. However, while operating as Lincoln Metals, the foundry is assumed to have produced “red brass”.

A review of the Resource and Conservation Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and all Alabama Department of Environmental Management (ADEM) Land, Air, and Water Division files, along with a comprehensive review of old permits, available aerial photographs, Sanborn<sup>®</sup> maps, and EPA databases, was conducted to determine previous violations or regulatory actions for the property. Based on records obtained from the ADEM Water Division files, Lincoln Metals Corporation failed to collect annual storm water samples from 1997 to 1999. In 2000, they failed to maintain a Best Management Practices Plan. Furthermore, the facility was reported as not having pollution prevention control measures. In 2001, the Lincoln Metals Corporation was cited by ADEM for discharging a pollutant without a permit and requested to better address its foundry sand disposal practices. On November 17, 2000, a compliance evaluation was conducted by the ADEM Water Division; however, no violations were noted. On September 20, 2002, the Lincoln Metals Corporation permit expired.

In December 2003, ADEM performed a RCRA investigation at the property, and grab soil samples were collected from locations both on and off the foundry property. Contaminants identified in the soil samples included aluminum, arsenic, cadmium, chromium, copper, lead, and zinc. Lead concentrations

from the Toxicity Characteristic Leaching Procedure (TCLP) lead was detected in all of the soil samples at concentrations above the hazardous waste benchmark of 5 milligrams per liter (mg/L) [equivalent to 5 micrograms per gram ( $\mu\text{g/g}$ ) or 5 milligrams per kilogram (mg/kg)]. Furthermore, the samples contained elevated concentrations of selenium as compared to the hazardous waste benchmark of 1 mg/L using the TCLP.

On January 21, 2004, three large debris piles were observed during a site reconnaissance inside the fenced boundary on the northwest end of the property. The piles consisted of remnant slag, foundry sand, broken casting ladles, faucet fittings, and other rubble. The spent foundry sand is known to contain copper compounds and other metals. At the time of the reconnaissance, foundry sand was observed in the natural runoff ditches both on site and off the foundry property, as well as leaving the property to the north and migrating onto railroad property through a ditch that runs west along the railroad tracks. In addition, foundry sand was observed along the northern boundary of the foundry facility. According to a conversation between property operators and the ADEM Industrial Hazardous Waste Branch, the facility dumped the foundry sand on the property during the last three to four years of operation. Foundry sand piles are located to the south west of the foundry building. Waste quantities and previous disposal practices are unknown. A reconnaissance conducted by ADEM noted foundry sand discarded on the dirt floor inside the facility. As of the date of this report, no removal of contaminated soil has taken place at the property.

START conducted a field investigation of the Lincoln Metals site on May 21 and 22, 2007. The investigation consisted of documenting on-site conditions, screening soil samples for metals contamination using a portable XRF instrument, collecting surface soil samples for laboratory analysis, and collecting Global Positioning System (GPS) data of the sampling locations.

The May 2007 investigation included the collection of 63 samples, including a background sample, outside the fenceline of the former Lincoln Metals foundry facility and the adjacent residential and public properties. A total of six metals were detected in the residential soil samples. Arsenic, barium, chromium, and lead were detected in all of the samples with arsenic concentrations ranging from 4.0 mg/kg to 15 mg/kg; barium concentrations ranging from 11 mg/kg to 100 mg/kg; chromium

concentrations ranging from 9.6 mg/kg to 920 mg/kg; and lead concentrations ranging from 37 mg/kg to 6,500 mg/kg. Cadmium was detected in all but one sample with concentrations ranging from 0.6 mg/kg to 2.4 mg/kg. Silver was detected in 14 samples with concentrations ranging from 0.05 mg/kg to 7.1 mg/kg. Selenium was detected in 5 samples at concentrations ranging from 5.7 mg/kg to 28 mg/kg. Polychlorinated Biphenyl (PCB) Aroclor-1232 was detected in four samples at concentrations ranging from 88 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) to 180  $\mu\text{g}/\text{kg}$ . Based on the results of the May 2007 sampling event, further investigation at the Lincoln Metals site was recommended.

### **Geology**

The site is located within the outcrop area of the undifferentiated Lower Ordovician-Upper Cambrian age Knox Group. The Knox Group is informally subdivided onto a lower unit of very cherty dolomite interbedded with minor amounts of limestone and an upper unit of less cherty dolomite with more limestone. The lower unit has a thickness of approximately 3,000 feet in Talladega County and consists mainly of light- to medium-dark-gray dolomite with dark colored chert nodules or beds. Interbedded within the dolomite are medium gray micritic limestones. Thin interbeds of grayish-orange very fine- to fine-grained quartzose sandstone are rare. The upper unit may have a thickness of a few hundred feet and consists of light to medium gray dolomite with medium dark gray micritic limestone. Dark-gray chert nodules or stringers are minor and laminae of very fine- to fine-grained quartz sand are locally present. The carbonate rocks, dolomite and limestone, indicate the likely presence of karst terrain and high permeability. Weathering of the Knox Group results in a cherty residue that is fairly porous and permeable.

Groundwater within competent bedrock occurs in interconnected densely spaced dissolution channels. The site is located within the recharge area for the Knox-Shady aquifer system. The source of aquifer recharge is the infiltration of precipitation that is estimated to be approximately 5 inches per year. Groundwater in the area can be reached at depths between zero and 25 feet. The Soil Conservation Service (SCS) classifies soils at the site as Grasmere silty clays, zero to 2% slopes. Grasmere silty clays are described by the SCS as deep well-drained soils that formed in material weathered from limestone. The surface layer of these soils consists of dark reddish-brown silty clay to a depth of approximately 19 inches. The subsurface layer is a buried soil of approximately 38 inches. The upper 12 inches is a dark

reddish brown silty clay loam, the middle 9 inches is dark-red silty clay mottled with reddish brown, and the lower 26 inches is dark-red clay. The subsoil consists of dark-red clay more than 50 inches thick. These soils have moderate permeability, and depth to bedrock is greater than 6 feet.

### **Field Investigation Activities**

The July 2007 RSE field investigation was conducted July 10 through 12, 2007 by START and the EPA On-Scene Coordinator (OSC). The investigation consisted of documenting on-site conditions, screening subsurface soil samples for metals contamination using a portable XRF, collecting surface and subsurface soil samples for laboratory analysis, and collecting GPS coordinates of the sampling locations. A Health and Safety Plan (HASP) and a Site Sampling Plan (SSP) were developed for the Lincoln Metals site RSE prior to fieldwork activities and have been submitted under separate cover.

START began the field investigation by conducting a brief site walk to visually assess on and off site conditions and create a site sketch. A locked chain-link fence surrounding the facility restricts unauthorized access. The foundry building was observed to be in a dilapidated state with portions of the roof missing. Stock piles of foundry sand were found to be only partially covered, allowing for erosion of some of the material. Grey foundry sand had migrated off site and into an adjacent drainage ditch. Much of the sampling area was saturated with water due to daily rain events that occurred during the field activities.

Forty-six sampling locations were identified within the site boundaries of the former Lincoln Metals foundry facility, and the adjacent residential and public properties (Figure 2, Attachment A). START collected a total of 60 soil samples, including five sets of field duplicates from the following locations:

- 23 composite subsurface soil samples from 14 borings located within the boundaries of the former Lincoln Metals foundry property (Figure 3, Attachment A);
- 8 composite subsurface soil samples from four borings located along the drainage ditch adjacent to the railroad tracks north of the property (Figure 3, Attachment A);
- 5 grab surface soil samples from the north side of the drainage ditch adjacent to the railroad tracks (Figure 3, Attachment A);

- 23 five-point composite soil samples from the front and back yards of 11 residential properties bordering the former Lincoln Metals property and the adjacent drainage ditch (Figure 4, Attachment A); and
- 1 grab background surface soil sample from an area near Highway 77, south of the former Lincoln Metals foundry (Figure 3, Attachment A).

Samples from two of the 46 sampling locations were not collected for laboratory analysis. Boring locations LM2-SS-01 and LM2-SS-15 were field screened in-situ for metals using the XRF.

Surface soil samples were collected at a depth of zero to 0.5 feet below ground surface (bgs) from the residential properties. The five surface soil samples from the north side of the drainage ditch along the railroad tracks were collected to a depth of one foot bgs using hand-augers. Subsurface soil samples were collected using a direct push Geoprobe<sup>®</sup> equipped with a 5-foot long MacroCore<sup>®</sup> soil sampler. Geologic boring logs were completed for all cores and are presented as Attachment C.

Tables 1 and 2 located in Attachment B summarize the residential and non-residential soil samples collected during the July 2007 RSE field investigation, respectively. All samples were collected in accordance with the EPA EISOPQAM.

Based on the approved SSP, Revision 2 submitted on July 5, 2007, XRF field screening results were to be used to delineate the extent of contamination and to aid in the selection of samples for analysis by a Contract Laboratory Program (CLP) laboratory. However, due to the unexpected wet weather experienced during the field investigation, most of the subsurface soil samples screened were submitted to the CLP laboratory for confirmation laboratory analysis because XRF results are adversely affected by the presence of moisture.

All surface soil samples collected from residential properties and the railroad track drainage ditch as well as those subsurface soil samples designated for confirmation laboratory analysis were packaged in accordance with the CLP Guidance for Field Samplers and then shipped to a CLP laboratory for PCB and RCRA 8 metals analysis. Additionally, five non-residential samples and one residential sample were selected for TCLP lead analysis.

A Trimble® GPS was used to survey the July 2007 RSE sampling locations. Table 3 located in Attachment B presents the GPS coordinates for the 46 soil sample locations. All sampling and field screening activities were documented with photographs and written logbook notes, including a site sketch. Boring logs are presented as Attachment C. A photographic log of site activities is presented as Attachment D and the logbook notes are included as Attachment E.

### **Field Screening Correlation Results**

A correlation between field screening and CLP laboratory results was performed for lead based on the results of 27 subsurface soil samples. Because each 5-foot soil core was screened in one to three places (top, middle, and bottom) and each subsurface soil sample was a composite of the entire 5-foot core, the average of the lead XRF results for each 5-foot core was used to compare to its associated CLP analytical result. A graph comparing the averaged lead XRF results to the CLP analytical results is presented with Table 4 located in Attachment B. The XRF and confirmation laboratory values have a linear correlation coefficient of 0.394 and a concentration coefficient of 4.12. According to EPA guidance, a minimum correlation coefficient of 0.700 is necessary to consider field screening results acceptable when compared with laboratory confirmation results. The XRF results from the July 2007 field investigation indicate a poor correlation to the laboratory data. This poor correlation was due to the presence of moisture in the screened samples as a result of heavy rains in the area before and during the sampling event.

### **XRF Screening Results**

A total of forty-six 5-foot long soil cores were screened in-situ for 17 metals including arsenic and lead using a Niton® XRF. These soil cores were collected from 14 locations on the former Lincoln Metals property and from five locations along the drainage ditch adjacent the railroad tracks. Soil cores were screened in-situ at one to three places (top, middle, and bottom) along the 5-foot core sample. XRF screening results indicated lead concentrations from zero parts per million (ppm) to 164 ppm. Arsenic was not detected in any of the XRF in-situ screening results. However, the correlation coefficient between the XRF screening results and the CLP analytical results indicates that the XRF lead results are unacceptable for use in decision-making processes associated with this site. Table 5 located in Attachment B summarizes the XRF data for the subsurface soil field screening.

### **Laboratory Analytical Results**

Thirty-one subsurface soil and 29 surface soil samples, including five sets of field duplicates were submitted to a CLP laboratory for PCB and RCRA 8 metals analysis. Additionally, two of the subsurface soil samples and three of the surface soil samples were analyzed for TCLP lead. Laboratory analytical results for samples collected during the July 2007 RSE field activities are presented in Table 6 located in Attachment B and summarized in this section.

Residential samples LM2-SS-25\_0-0.5 through LM2-SS-45\_0-0.5 were analyzed for PCB and RCRA 8 metals including mercury, arsenic, barium, cadmium, chromium, lead, selenium, and silver. Additionally, one of the samples was analyzed for TCLP lead. Table 7 in Attachment B presents a summary of the analytical results detected in at least one residential sample compared to Region 9 Preliminary Remediation Goal (PRG) for residential soil or RCRA Hazardous Waste Classification levels, as appropriate. A total of eight metals and one PCB (Aroclor-1260) were detected among the residential soil samples. Arsenic, barium, chromium, lead, and silver were detected in all residential samples. Arsenic concentrations ranged from 4.3 mg/kg to 16 mg/kg; barium concentrations ranged from 33 mg/kg to 240 mg/kg; chromium concentrations ranged from 6.6 mg/kg to 39 mg/kg; lead concentrations ranged from 25 mg/kg to 490 mg/kg; and silver concentrations ranged from 0.58 mg/kg to 2.4 mg/kg. Chromium was detected in 19 samples with concentrations ranging from 0.68 mg/kg to 2 mg/kg. Mercury was detected in nine samples with concentrations ranging from 0.12 mg/kg to 0.99 mg/kg while selenium was detected in five samples with concentrations ranging from 0.45 mg/kg to 0.82 mg/kg. PCB Aroclor-1260 was detected in four samples with concentrations ranging from 7.9 µg/kg to 41 µg/kg.

Non-residential samples LM2-SS-02\_0-5 through LM2-SS-24\_0-0.5 were analyzed for PCB and RCRA 8 metals. Additionally, four of these samples were analyzed for TCLP lead. Table 8 in Attachment B presents a summary of the analytical results detected in at least one non-residential sample compared to the Region 9 PRG for industrial soil. All eight RCRA metals and three PCB (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected among the non-residential soil samples. Arsenic, barium, chromium, lead, and silver were detected in all non-residential samples. Arsenic concentrations ranged from 3.7 mg/kg to 57 mg/kg; barium concentrations ranged from 11 mg/kg to 140 mg/kg; chromium concentrations ranged from 4.1 mg/kg to 42 mg/kg; lead concentrations ranged from 6.9 mg/kg to 1,800

mg/kg; and silver concentrations ranged from 0.47 mg/kg to 10 mg/kg. Cadmium was detected in 28 of the non-residential soil samples with concentrations ranging from 0.62 mg/kg to 6.1 mg/kg. Selenium was detected in six samples with concentrations ranging from 0.49 mg/kg to 1.8 mg/kg. Mercury and PCB Aroclor-1254 were detected in three samples with concentrations ranging from 0.13 mg/kg to 0.2 mg/kg and 4.5 µg/kg to 170 µg/kg, respectively. PCB Aroclor-1260 was detected in two samples with concentrations ranging from 4.6 µg/kg to 7.1 µg/kg and PCB Aroclor-1248 was detected in one sample at a concentration of 23 µg/kg.

### **Conclusion**

In July 2007 START performed XRF field screening and sampling activities at Lincoln Metals. START collected a total of 60 soil samples from 46 sampling locations within the site boundaries of the former Lincoln Metals foundry facility, and the adjacent residential and public properties. Due to rainfall events during the investigation and the resulting moisture in the soil at the site, the XRF field screening data was unable to be correlated to the laboratory results. However, surface and subsurface soil samples were submitted to a laboratory for analysis. Samples were analyzed for total metals, PCB, and in some cases, TCLP lead.

If you have any questions or comments regarding this letter report or require any additional information please contact me at (678) 355-5550, extension 2243 or at (678) 255-6439.

Sincerely,



John Darius Soltes  
START Project Manager, T N & Associates, Inc.

Enclosure(s)

- Attachment A – Figures
- Attachment B – Tables
- Attachment C – Boring Logs
- Attachment D – Photographic Log
- Attachment E – Logbook Notes

**ATTACHMENT A**

**Figures**

**(Four Pages)**

**ATTACHMENT B**

**Tables**

**(42 Pages)**

**ATTACHMENT C**

**Boring Logs**

**(18 Pages)**

**ATTACHMENT D**

**Photographic Log**

**(5 Pages)**

**ATTACHMENT E**

**Logbook Notes**

**(8 Pages)**