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January 11, 2008

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Subject: Removal Site Evaluation Report, Revision 1
Kentucky Wood Preserving
EPA Contract No.: EP-W-05-053
Technical Direction Document (TDD) No.: TNA-05-003-0044

Dear Mr. Patel:

T N & Associates, Inc. (TN&A) Superfund Technical Assessment and Response Team (START) is submitting one copy of the Removal Site Evaluation (RSE) Report, Revision 1 for the Kentucky Wood Preserving site located in Winchester, Clark County, Kentucky.

Please contact me at (678) 255-7764 if you any questions or comments regarding this report.

Sincerely,

Stacey DeLaReintrie
START Project Manager

Enclosure

cc: Art Smith, EPA On-Scene Coordinator
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START File

REMOVAL SITE EVALUATION REPORT

**Kentucky Wood Preserving
Winchester, Clark County, Kentucky
EPA ID No.: KYD981473697**

Revision 1

Prepared for:

**U.S. ENVIRONMENTAL PROTECTION AGENCY
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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) tasked the T N & Associates, Inc. (TN&A) Superfund Technical Assessment and Response Team (START) to perform a Removal Site Evaluation (RSE) at the Kentucky Wood Preserving site (site), located in Winchester, Clark County, Kentucky, under Contract Number (No.) EP-W-05-053, Technical Directive Document (TDD) No. TNA-05-003-0044. The general purpose of a RSE is to collect information on current site conditions to identify the nature and extent of contamination and determine the need for federal intervention under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986.

Under this TDD, START completed the following tasks:

- documented site conditions and RSE field investigation activities with written logbook notes and digital photographs;
- developed an Integrated Work Plan (IWP) that included detailed site-specific sampling and analysis procedures and quality assurance measures to be adhered to while conducting a comprehensive investigation designed to define the nature and extent of copper, chromium, and arsenic contamination on and off site;
- revised the site-specific Health and Safety Plan (HASP) for the emergency response (ER) to address Health Safety issues associated with conducting field investigation activities; and,
- performed field investigation activities including field screening and multimedia sampling as outlined in the IWP.

This comprehensive RSE report summarizes the existing conditions at the site; describes the field investigation activities; and delineates the limits, nature, and extent of soil and sediment contamination at the site and the neighboring off-site properties. The RSE report provides information to assess immediate risks to human health and the environment; and soil removal volumes. Environmental and quality assurance/quality control (QA/QC) analytical data was evaluated and summary data tables are included as Appendix B. Significant QA/QC issues regarding sample collection, handling, and analysis are identified as necessary within the report.

All activities and procedures described in this document were conducted in accordance with the EPA Science and Ecosystems Support Division (SESD) Region 4 *Environmental Investigations Standard Operating Procedures Quality Assurance Manual* (EISOPQAM) dated November 2001, the Superfund Lead-Contaminated Residential Sites Handbook, and the TN&A Quality Assurance Program Plan (QAPP) (Refs. 1, 2, 3).

The following sections provide the details of this RSE:

- Section 2 – Describes the site background
- Section 3 – Describes the field investigation
- Section 4 – Describes the quality assurance/quality control
- Section 5 – Describes the analytical results
- Section 6 – Describes the summary and conclusion

Figures and summary data tables are provided as Appendices A and B, respectively. A photographic log is provided as Appendix C and the analytical case narrative report is provided as Appendix D. Appendix E is a copy of the Hexavalent Chromium analytical report that was provided by the Emergency and Rapid Response Services (ERRS) contractor. References are cited throughout the RSE report to substantiate site-specific statements. A reference list is provided in Section 7.0.

2.0 SITE BACKGROUND

This section describes the site characteristics, site history, and previous investigations conducted at the site.

2.1 SITE LOCATION AND DESCRIPTION

The site is a former wood preserving facility located at 200 Magnolia Street in Winchester, Clark County, Kentucky. The geographic coordinates from the center of the property are 38.003055 degrees North Latitude and -84.176388 degrees West Longitude. The site is approximately three acres in size and is located in a predominantly urban area within a mixed commercial/residential neighborhood. It is bounded to the west and southwest by railroad tracks; to the southeast, east, and northeast by residential properties; and to the north by Magnolia Street, beyond which are businesses and residential properties (see Appendix A, Figure 1).

Surface water from the site flows to the west where it leaves the property via a culvert beneath the railroad tracks. The culvert empties into an unnamed drainage ditch that flows northwest until it intersects Strodes Creek (see Appendix A, Figure 2).

2.2 SITE CHARACTERISTICS

The former Kentucky Wood Preserving facility consists of a wood preserving treatment building and drip pad; four abandoned treatment cylinders; and several outbuildings including a maintenance shop and offices. Between the mid-1950s to the mid-1980s, the maintenance shop was the location of the wood treatment works. In the mid-1980s, wood preserving operations were relocated to the newly constructed treatment building and drip pad located on the southern portion of the property.

Until the recent EPA emergency Removal Action (RA), a significant quantity of untreated wood poles and posts were strewn across the site, in addition to numerous piles of wood mulch and other debris. The ERRS contractor has since removed or segregated these materials into staging areas on the property.

2.3 SITE OPERATIONS AND HISTORY

The site operated as a wood preserving facility from 1958 until its closure in October 2006. Steam treatment and chromated-copper-arsenate (CCA) processes were used to treat lumber at the site during its operational history. CCA is a chemical preservative that protects wood from rotting due to insects and microbial agents. CCA has been used to pressure treat lumber used for decks, playgrounds (play sets) and other outdoor uses since the 1940s; however, the CCA preserving process was banned by EPA in December 2003 due to the exposure risks associated with arsenic. Specifically, young children who routinely put their hands in their mouths (generally children under six years of age) can then ingest the arsenic directly from their hands or indirectly when they touch food or toys, which are then placed in their mouths.

In November 2006, the EPA received a National Response Center (NRC) report indicating the potential release of hazardous substances at the site. The report indicated that the facility was abandoned and that storage tanks on the property were full of CCA solution posing a threat to release. EPA initiated an initial RSE under section 300.410 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The RSE was conducted in April 2007 and is discussed in Section 2.4 of this document; however, key findings of the initial RSE indicated that the facility was unsecured, that approximately 70,000 to 80,000 gallons of CCA solution and product were present on site, and that the treatment works containment sump was full and a spill was imminent unless action was taken to prevent an overflow.

On June 12, 2007, the Kentucky Department of Environmental Protection (KDEP) visited the site and discovered that vandals had broken into the treatment building and pried open the door of the pressure cylinder. KDEP also spoke to a nearby resident who had expressed concerns about trespassing to the local police. As a result of the site visit, on June 15, 2007, KDEP referred the site to the EPA, citing concerns over the unstable conditions at the site.

On July 18, 2007, the EPA, the ERRS contractor, and START mobilized to the site to conduct an emergency RA. During the first phase of the RA, work activities included erecting a fence to secure the site perimeter; removing large piles of wood debris and lumber; and arranging for off-site disposal of CCA solutions. Subsequent RA activities are to be determined based on the results of this RSE investigation.

2.4 PREVIOUS INVESTIGATIONS

The following section summarizes previous investigations conducted at the site. Information provided to START includes the Phase II report completed by Hall & Associates (H&A) and an EPA Action Memorandum documenting the decision to initiate emergency response actions at the site (Refs. 4, 5).

In February 2000, H&A conducted a Phase II investigation on behalf of the Milgrom Group (owners of the site at the time). The investigation focused on assessing the soils around the maintenance shop and the former treatment works building. The investigation was based on interviews with employees who had worked for the former owner and had indicated frequent past releases to the environment. H&A collected four surface soil samples from zero to four inches below ground surface (bgs), 26 subsurface soil samples from 12 borings at varying depths not exceeding 12 feet bgs, one groundwater sample from one of the soil borings, and two sediment samples from the unnamed drainage ditch that collects surface water runoff from the site. Laboratory analytical results indicated maximum concentrations of arsenic at 36,000 parts per million (ppm), chromium at 14,000 ppm, and copper at 25,000 ppm in a surface soil sample collected near the back of the maintenance shop. Analytical results for the subsurface soil samples collected from the same location indicated arsenic concentrations of 1,100 ppm in the two to four foot bgs depth interval and 550 ppm in the eight to 10 foot bgs depth interval. Soil boring logs describe the soil at this location as green to olive in color. No soil samples were collected near the new treatment building. Analytical results for sediment samples collected from the unnamed ditch indicated arsenic concentrations of 35 ppm and 17 ppm. The groundwater sample identified arsenic at 87 milligrams per liter (mg/L), chromium at 37 mg/L, and copper at 24 mg/L (Ref. 4).

On April 10, 2007, EPA and KDEP conducted a RSE at the site. The treatment works building, drip pad, and maintenance shops were inspected during the initial RSE. Additionally, KDEP conducted soil screening using a XRF instrument. Eight 55-gallon drums were observed on the drip pad adjacent to the treatment works building. Five of the drums were located within a gated enclosure while the remaining three drums appeared to be full, labeled as F035 hazardous waste, and were unsecured. The containment sump, used to collect CCA solution during wood preserving treatment, was observed to be within one foot of capacity. KDEP collected a liquid sample from the containment sump beneath the primary treatment cylinder and submitted it to a laboratory for metals analysis. Aside from the pressure cylinders located in the treatment works buildings, two additional pressure cylinders were discovered in the maintenance shop. Staining of soils beneath the cylinders was a greenish-yellow color, indicating likely contamination with CCA constituents. An above-ground storage tank (AST), previously used to collect condensate from the cylinders, was observed to be approximately one-half full of an unknown liquid substance. Screening of the site soils by KDEP indicated that arsenic and chromium concentrations exceeded the recognized values for natural background concentrations in the local area. The maximum concentrations of arsenic and chromium detected at the site were 200 ppm and 375 ppm, respectively.

Following the site inspection, KDEP reported the following information to EPA: (1) analytical results for wastewater samples collected from tanks and containment at the site revealed arsenic and chromium at maximum levels of 67 mg/L and 152 mg/L, respectively; and (2) volume calculations for the treatment building tanks indicated that approximately 70,000 to 80,000 gallons of CCA solution and product were present on site and that a spill was imminent unless action was taken to prevent an overflow (Ref. 5).

3.0 FIELD INVESTIGATION ACTIVITIES

START performed field investigation activities, including the collection of environmental samples to determine the nature and extent of CCA contamination at the site and adjacent off-site properties. Soil and sediment samples were collected to determine CCA contaminants in excess of the Region 4 Cleanup Level (RCL) for arsenic and chromium. The RCL for the site are presented in Table 1 located in Appendix B. Data obtained from this RSE provides information needed to determine the degree of removal for on-site soils, off-site sediments, and nearby residential surface soils.

An Integrated Work Plan (IWP) was developed for the RSE prior to fieldwork (Ref. 6). The IWP describes the data quality objectives (DQO), sampling strategy, sampling methodology, and analytical procedures used during the RSE.

The RSE was conducted from September 24 to October 4, 2007. A total of 127 site-wide soil samples, 14 on-site source area soil samples, 17 off-site soil samples, and four creek sediment samples, excluding QC samples, were collected during the RSE investigation. Table 2 in Appendix B presents a summary of the samples collected. All samples were collected in accordance with the EPA SESD EISOPQAM dated November 2001. All on- and off-site soil samples were screened for chromium, copper, and arsenic using a Niton[®] XLt 700 Series XRF. A subset of on-site soil samples were submitted to a Contract Laboratory Program (CLP) laboratory for total arsenic, chromium, and copper analysis in accordance with CLP Statement of Work (SOW) ILM05.3 to evaluate the accuracy of the XRF screening results. All off-site sediment and soil samples were submitted to a CLP laboratory for total arsenic, chromium, and copper analysis.

Although not included in the original IWP, six soil samples were submitted to a non-CLP laboratory for hexavalent chromium analysis. The sample locations were determined based on elevated XRF readings for chromium. Due to the short holding time (less than 24 hours) associated with hexavalent chromium samples, a non-CLP laboratory was procured by the ERRS contractor working on site.

This section summarizes field investigation activities including site-wide soil sampling (subsection 3.1), on-site source area soil sampling (subsection 3.2), off-site soil sampling (subsection 3.3), sediment sampling (subsection 3.4), field screening (subsection 3.5), and the global positioning system (GPS) survey (subsection 3.6). Table 2 in Appendix B presents a summary of all of the samples collected and their associated location. Photographic documentation is provided as Appendix C.

3.1 ON-SITE SOIL SAMPLING

Site-wide sampling was conducted to determine the presence or absence of contaminated soils on the property and the need for removal actions. A 50-by-50 foot grid was established over the entire property; the grids are shown in Figure 3, Appendix A. Soil samples were collected from 55 of the 50-by-50 foot grids. During the field investigation it was determined that the drip pad area would be divided into two independent grids, approximately 60-by-60 foot in size. These grids were screened and sampled using the same methodology as the 50-by-50 foot grids. In order for START to access the soil beneath the asphalt,

the ERRS contractor used an excavator to remove asphalt and gravel overburden from the aliquot screening and sampling locations. In-situ screening for chromium, copper, and arsenic using the Niton[®] XRF was performed at five points (in an arrangement similar to a five on a dice) within each grid to determine a subsurface soil sampling location. A composite surface soil sample (zero to 0.5- foot bgs) was collected at each grid from aliquots at the five in-situ screening points.

A subsurface soil sample (0.5 to 2- feet bgs) was collected from each grid at the in situ screening location where the XRF arsenic result was highest. Subsurface soil grab samples were screened for chromium, copper, and arsenic using the XRF. If screening results from the subsurface soil sample indicated arsenic concentrations exceeding 160 ppm, the RCL for arsenic in industrial soils, then the grid was sampled in a manner similar to the source areas. A test pit was excavated and soil samples were collected and screened using the XRF at each 3-foot depth interval until groundwater levels were reached, soil refusal occurred, or the XRF screening level for arsenic was less than 160 ppm. Additional subsurface soil samples were collected from eight grids at intervals greater than 2-feet bgs to depths as great as 9-feet bgs.

In addition, three subsurface soil samples from the 3 to 6 feet bgs depth interval were collected for hexavalent chromium analysis at the following locations: KWP-C6-SB, KWP-D8-SB, and KWP-C7-SB.

3.2 ON-SITE SOURCE AREA SOIL SAMPLING

Subsurface soil samples were collected from five test pits excavated near suspected source areas to determine vertical extent of contamination. Test pits were excavated on the south and east sides of the maintenance shop and on the north, south, and east sides of the treatment building approximately 10 feet from the edge of the buildings. A total of 13 grab soil samples were collected from the test pits. Samples were collected in 3-foot depth intervals until groundwater or bedrock was encountered, or the XRF screening level for arsenic was less than 160 ppm. The samples were screened for chromium, copper, and arsenic using the Niton[®] XRF.

A surface soil sample was also collected from the greenish-colored soil observed under the treatment cylinder in the maintenance building. This area was sampled and screened as a potential source area. Figure 4 located in Appendix A, shows the sampling locations for the on-site analytical samples.

Finally, two source area samples were collected for hexavalent chromium analysis from the following locations: KWP-TC-01 and KWP-TP-03.

3.3 OFF-SITE SOIL SAMPLING

Residential soil samples were collected from six off-site properties adjacent to the site to determine whether a removal action is necessary in these areas. Five-point composite surface soil samples (zero to 0.5-foot bgs) were collected from each property's front or back yard, whichever was adjacent to the site. At two properties, composite surface soil sample were collected from both front and back yards since the arsenic screening result for the first sample on the property exceeded 40 ppm, the RCL for arsenic in residential soil. Furthermore, subsurface soil samples (0.5 to 2-foot bgs) were collected from the adjacent yards of two properties. Figure 5 located in Appendix A, shows the locations of the off-site residential samples.

In the IWP, off-site soil sampling was also proposed at the industrial property located adjacent to the site at 208 Magnolia Street. Access to this property was denied; therefore, no samples were collected from the property. Three additional sampling locations were identified on the west side of the property along the railroad right-of-way. One grab surface sample (zero to 0.5-foot bgs) and one subsurface (0.5 to 2-foot bgs) soil sample were collected at each location. Each grab sample was screened for chromium, copper, and arsenic using the XRF.

A background surface soil sample was collected from an area located a sufficient distance from potential impacts of on-site contamination. The sample was screened for arsenic, chromium, and copper using the Niton[®] XRF.

Finally, a surface soil sample (zero to 0.5-foot bgs) was collected for hexavalent chromium analysis from the back yard of one residential property located adjacent to the facility.

3.4 SEDIMENT SAMPLING

Sediment samples were collected from points located in the unnamed drainage creek located southwest of the site to determine whether site-related constituents, primarily chromium, copper, and arsenic, are migrating off site. Four sediment samples were collected from the creek bed of Strodes Creek (drainage creek) at the following locations:

- KWP-DC-01 was collected at the Magnolia Street Bridge
- KWP-DC-02 was collected upstream of the confluence with the tributary from the site
- KWP-DC-03 was collected downstream of the confluence with tributary from the site

- KWP-DC-04 was collected at a point between the first and third locations.

Figure 6 located in Appendix A, shows the locations of the sediment samples.

3.5 FIELD SCREENING

A Niton® XLt 700 Series XRF instrument was used to field screen all soil samples for chromium, copper, and arsenic concentrations. Site-wide grids were also screened in-situ to determine subsurface sampling locations. XRF screening results were used to identify samples for confirmation laboratory analysis and to identify chromium, copper, and arsenic contamination at the site.

3.6 GLOBAL POSITIONING SYSTEM

A Trimble™ GeoXT™ GPS was used in the field to survey RSE sampling locations. GPS coordinates were collected from the exact sampling location with the following exceptions. The coordinates for composite soil sample locations were collected from the center of the grid. Additionally, if a station was in an area where a GPS signal could not be received, sampling stations were collected from the nearest point where a signal was received and noted in the field logbook. Table 2 in Appendix B presents the GPS coordinates for each sample collected.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

QA/QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents. This section describes the QA/QC measures taken and provides an evaluation of the usability of data presented in this report.

All samples were collected in accordance with the EPA SESD EISOPQAM dated November 2001, and the guidance presented in the approved site-specific IWP (Ref. 6). A START scientist performed field screening of soils for chromium, copper, and arsenic using a XRF in accordance with the manufacturer's instructions for the instrument. A subset of the on-site soil samples, all of the off-site residential soil samples, and the sediment samples were analyzed by a CLP laboratory for chromium, copper, and arsenic in accordance with CLP SOW ILM05.3. Specific QC requirements for laboratory analyses are

incorporated in the CLP SOW ILM05.3. These QC requirements were followed for analytical work on the project.

Field screening data were not validated since the data was used strictly for screening purposes and not to evaluate site contamination. Correlation between the field screening results and laboratory analytical data was performed by a START chemist and is discussed in subsection 4.2.

4.1 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Two QA samples (two rinsate blanks) were collected during the sampling event. Trip blank samples are not required for inorganic analyses. QC samples included matrix spike (MS)/matrix spike duplicate (MSD) and field duplicate (DUP) samples for inorganic analyses at a rate of one MS/DUP per 20 samples per matrix per analysis. Additionally, confirmation samples were collected at a rate of one per 10 samples. Rinsate blank sample results did not indicate any contamination of arsenic, copper, or chromium. Field duplicate samples were within 50% relative percent difference of each other as allowed by the CLP National Functional Guidelines (NFG) for inorganic analysis of soils.

Although not included in the original IWP, six soil samples were submitted to non-CLP laboratory for hexavalent chromium analysis. Due to a short holding time associated with hexavalent chromium samples, a non-CLP laboratory was procured by the ERRS contractor working on site. The laboratory did not report QA/QC criteria for samples analyzed and therefore, data obtained from the non-CLP laboratory should be considered of limited use.

In addition, START performed standard checks twice daily of the XRF equipment using Standard Reference Materials (SRM) for arsenic. All performance check results indicated that the XRF instrument was working properly for arsenic detection. In addition, approximately fifteen percent (15%) of the soil samples collected were submitted to a CLP laboratory for total arsenic, chromium, and copper analysis in accordance with CLP SOW ILM05.3 to evaluate the accuracy of the XRF screening results. Samples were selected for laboratory analysis based on the criteria outlined in Section 2.1.3.5 of the IWP.

4.2 FIELD ANALYSIS

A START scientist analyzed 141 soil samples for chromium, copper, and arsenic concentrations using the Niton[®] XRF instrument. The field results were used to determine the extent of contamination and to

determine which samples to send for CLP laboratory analysis. Twenty-three soil samples were submitted to a CLP laboratory for confirmation analysis. Correlation between field screening results and laboratory results was performed for arsenic. Sample points with non-detect values for either the XRF or the laboratory results were not used in the correlation calculations. The correlation coefficient for arsenic was 0.960. According to EPA guidance, a minimum correlation coefficient of 0.700 is necessary to consider field analytical results acceptable when compared with laboratory confirmation results. This correlation indicates that the XRF had good agreement for arsenic results. However, the arsenic correlation drops to 0.6695, when the very high concentration samples (>15,000 ppm) are excluded. The XRF results are more accurate for samples containing higher concentrations of metals. This interpretation of the results is consistent with the understanding that the XRF is designed for higher concentration samples and may not be as accurate for low concentrations.

XRF and laboratory analytical data for all samples collected and screened are presented in Tables 3 to 6. In this report, laboratory analytical data was the primary data used for interpretation of chromium, copper, and arsenic, in on-site soils; off-site residential soils; and off-site sediment. Low-concentration XRF screening results are of limited use because of the low correlation of chromium, copper, and arsenic results within the range of the clean-up target levels. The XRF data was not used to evaluate metals contamination; instead it was used solely for screening purposes in the railroad right-of-way (off-site) soils and on-site soils.

4.3 LABORATORY ANALYSIS

Data from the CLP laboratory was reviewed and validated by SESD in accordance with the NFG and Data Validation Standard Operating Procedures for CLP Routine Analytical Services (Ref. 10). A case narrative and data qualifier report was generated for the lab data and is presented as Appendix D. The case narrative provides a summary of any deficiencies associated with each lab data set. The data qualifier report alerts the project leader of quality control problems identified during the data validation process. According to the case narrative provided by SESD, low-level concentrations of several metals were identified in the method blank sample associated with one or more of the sample batches for this project. Subsequently, the reported detection limits were adjusted as high as five times blank levels to discount possible false positives due to contamination. Qualification to data usability is unwarranted since arsenic, chromium, and copper were detected above the adjusted reporting limit in all samples. In addition, the serial dilution percent difference for copper was outside QC limits in the sample batch associated with samples KWP-OF-06B, KWP-F6-SS, KWP-G7-SS, KWP-C6-SB-3-6, KWP-C6-SB-3-

6D, KWP-C7-SB-3-6, KWP-C7-SB-6-9, KWP-TP-02-1-3, KWP-TP-02-3-6, KWP-B5-SS, KWP-OF-04B, and KWP-TC-01. The copper results for these samples were qualified as estimated (J) but are usable to evaluate site contamination.

As previously stated, six soil samples were submitted to an ERRS-procured non-CLP laboratory for hexavalent chromium analysis. The laboratory did not report QA/QC criteria for samples analyzed and, data obtained from the non-CLP laboratory for hexavalent chromium should be considered of limited use.

5.0 SITE INVESTIGATION RESULTS

The following sections summarize field screening and CLP analytical results for samples collected during the RSE field activities. For the purposes of evaluating sample results, arsenic, chromium, and copper were compared to the applicable RCL for Industrial and Residential soils. The RCL for the site are presented in Table 1 in Appendix B.

5.1 ON-SITE SOIL

One hundred forty-one on-site soils (56 composite surface soils and 85 subsurface soils) were collected and screened for chromium, copper, and arsenic from 55 site-wide grids; five test pits excavated adjacent to the maintenance building and treatment building; and from beneath the treatment cylinder located in the maintenance building. Twenty-three soil samples were submitted to a CLP laboratory for confirmation analysis. Results for on-site soil samples including XRF and confirmation laboratory results are presented in Table 3. For the purposes of evaluating site-wide soils, only the CLP laboratory results are discussed.

Arsenic, chromium, and copper were detected in all 23 samples submitted to the laboratory for analysis. Arsenic was detected in surface soils at concentrations ranging from 8.2 to 2,100 mg/kg and in subsurface soils at concentrations ranging from 5 to 15,000 mg/kg. Three surface soils samples, collected from grid C6, F7, and beneath the treatment cylinder in the former treatment building; and eight subsurface soil samples collected from 0.5 to 2 feet bgs from grid C6, 0.5 to 2 and 3 to 6 feet bgs from grid C7, 6 to 7 feet bgs from grid E6, 0.5 to 2 feet bgs from grid F5, 1 to 3 feet bgs from test pit TP02, and 0 to 3 and 3 to 6 feet bgs from test pit TP03 exceeded the RCL for arsenic in industrial soil of 160 mg/kg. Chromium was detected in surface soils at concentrations ranging from 23 to 18,000 mg/kg and in subsurface soils at

concentrations ranging from 19 to 4,500 mg/kg. Two surface soil samples, collected from grids C6 and beneath the treatment cylinder in the former treatment building; and three subsurface soil samples, collected from 0.5 to 2 feet bgs from grid C6, 3 to 6 feet bgs from grid C7, and 0 to 3 feet bgs from test pit TP03 exceeded the RCL for chromium of 660 mg/kg. Copper concentrations ranged from 17 mg/kg to 2,000 mg/kg in the surface soil samples; and 17 to 11,000 mg/kg in the subsurface soil samples. None of the samples exceeded the Region 9 Preliminary Remediation Goal (PRG) for copper in industrial soil of 41,000 mg/kg.

In addition, the three subsurface soil samples (3- to 6-feet bgs) submitted for hexavalent chromium analysis indicated the following hexavalent chromium concentrations: (1) less than 2.0 mg/kg at KWP-C6-SB, (2) 11 mg/kg at KWP-D8-SB, and (3) 14 mg/kg at KWP-C7-SB. The data associated with the hexavalent chromium samples is of limited use because the laboratory did not report QA/QC criteria.

5.2 OFF-SITE SOIL

Sixteen off-site soil samples were collected from three railroad right-of-way locations and six residential properties. Results for off-site soil samples are presented in Appendix B, Tables 4 and 5. For the purpose of this discussion, laboratory analytical results for residential soil samples and XRF results for the railroad right-of-way samples will be summarized.

In the residential soil samples, arsenic, chromium, and copper were detected in all 10 samples at concentrations ranging from 9.1 to 97 mg/kg, 21 to 110 mg/kg, and 21 to 100 mg/kg, respectively. Two samples collected from the surface and subsurface of the property located adjacent to the former drip area, exceeded the RCL for arsenic in residential soil of 40 mg/kg. None of the samples exceeded the RCL for chromium or the PRG for copper in residential soils.

In the railroad right-of-way samples, arsenic, was detected in all of the samples, however, only one surface soil sample exceeded the RCL for industrial soil of 160 mg/kg.

In addition, the surface soil sample (zero to 0.5-foot bgs) collected for hexavalent chromium analysis from the back yard of the residential property located at 160 Magnolia Street indicated hexavalent chromium concentrations less than 2.0 mg/kg.

5.3 SEDIMENT

Four sediment samples were collected from Strodes Creek and submitted to a CLP laboratory for total arsenic, chromium, and copper analysis. Results for sediment samples are presented in Appendix B, Table 6. For the purposes of evaluating these results, the sediment samples were compared to the Region 4 Waste Management Division Sediment Screening Values for Hazardous Waste Sites (EcoReg). However, the issue of whether detected concentrations constitute an unacceptable environmental risk is beyond the scope of the RSE. The limited environmental sampling results of the stream sediments off site will only be used to confirm the off-site release of metals. This data may be used by others for purposes of determining whether additional investigation of the stream is needed.

Total arsenic, chromium, and copper were detected in all samples. Arsenic concentrations ranged from 9 mg/kg to 59 mg/kg. Chromium concentrations ranged from 14 mg/kg to 52 mg/kg while copper concentrations ranged from 17 mg/kg to 49 mg/kg. All of the samples exceeded the arsenic EcoReg of 7.23 mg/kg and three samples exceeded the copper EcoReg of 18.7 mg/kg. None of the samples exceeded the chromium EcoReg of 52.3 mg/kg.

6.0 SUMMARY AND CONCLUSIONS

The former Kentucky Wood Preserving site operated as a wood preserving facility from 1958 until its closure in October 2006. Steam treatment and CCA processes were used to treat lumber at the site during its operational history. A Phase II investigation conducted while the facility was operational indicated that on-site surface and subsurface soils were contaminated with arsenic, chromium, and copper. Soon after facility closure, the EPA received a report indicating that storage tanks on the property were full of CCA solution posing a threat to release. Follow-up investigations, conducted by the EPA and KDEP in 2007, indicated that approximately 70,000 to 80,000 gallons of CCA solution and product were present on site, the treatment works containment sump was full and a spill was imminent unless action was taken to prevent an overflow, and on-site soils contained elevated concentrations of arsenic, copper, and chromium. Additionally, the facility was unsecured and previous break-ins into the treatment building had been observed. An emergency RA was conducted in July 2007 to stabilize site conditions. RA work activities included erecting a fence to secure the site; removing large piles of wood debris and lumber; and arranging for off-site disposal of CCA solutions.

From September 24 to October 4, 2007, START conducted a RSE field investigation at the site to identify the nature and extent of CCA contamination on and off site and to determine the need for federal intervention under CERCLA. A total of 127 site-wide surface and subsurface soil samples, 14 on-site source area subsurface soil samples, 22 off-site surface and subsurface soil samples, and four creek sediment samples, excluding QC samples, were collected. All on- and off-site soil samples were field screened for total arsenic, chromium, and copper using a Niton[®] XRF. In addition, 23 soil samples were submitted to a CLP laboratory for confirmation analysis of total arsenic, chromium, and copper. Correlations between field and laboratory results for arsenic indicated a correlation coefficient of 0.960. However, XRF chromium, copper, and arsenic results were not used to evaluate contamination at the site because of their low correlation within the range of the clean-up target levels when very high concentration samples were excluded.

A total of 37 samples (23 on-site confirmation samples; 10 off-site residential soil samples; and 4 off-site sediment samples) were submitted to the CLP laboratory for analysis of total arsenic, chromium, and copper. CLP laboratory data were the primary data used for interpretation of arsenic, chromium, and copper concentrations in soils and sediment. For the purpose of interpreting sampling results, RSE results were compared to the residential or industrial RCL for arsenic and chromium; and the PRG for copper, as appropriate.

Laboratory analytical results indicated that on-site arsenic concentrations ranged from 8.2 to 2,100 mg/kg in surface soils and 5 to 15,000 mg/kg in subsurface soils. Three surface soil samples and eight subsurface soils in the vicinity of the former treatment building exceeded the RCL of 160 ppm for arsenic in industrial soil. Chromium was detected in surface soils ranging from 23 to 18,000 mg/kg and in subsurface soils ranging from 19 to 4,500 mg/kg. Two surface soil samples and three subsurface soil samples in the vicinity of the former treatment works building exceeded the RCL of 660 mg/kg for chromium in industrial soil. Copper concentrations ranged from 17 mg/kg to 2,000 mg/kg in the surface soil samples; and 17 to 11,000 mg/kg in the subsurface soil samples. None of the samples exceeded the PRG for copper in industrial soil of 41,000 mg/kg.

As expected, analytical data confirmed that the area surrounding the former treatment works building contains high concentrations of arsenic in surface and subsurface soils. Analytical results indicated arsenic concentrations exceeding the RCL of 160 ppm in industrial soils to a depth of 7 feet bgs. Analytical and XRF results confirm that arsenic concentrations generally decrease with distance and depth from the former treatment building. In the new treatment building area, analytical and XRF results

indicated that surface and subsurface soil samples with detectable levels of arsenic did not exceed the RCL of 160 ppm.

Laboratory analytical results indicated that in the residential soil samples, arsenic, chromium, and copper were detected in all 10 samples at concentrations ranging from 9.1 to 97 mg/kg, 21 to 110 mg/kg, and 21 to 100 mg/kg, respectively. Two samples, collected from the surface and subsurface of the property located adjacent to the former treatment area, exceeded the RCL for arsenic in residential soil of 40 mg/kg. None of the samples exceeded the RCL for chromium or the PRG for copper in residential soils.

Contaminated soils exceeding guidance values are present in the area of the former treatment works area, and the backyard of one residence. Based on the proximity of residential properties to the site, the contaminated soils pose a potential direct contact threat to the public. EPA will determine any further actions for this property.

7.0 REFERENCES

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