CDM Smith

Memorandum

To: *Rebecca Thomas, EPA Remedial Project Manager*

From: *Nick Raines, CDM Smith Project Manager*

Date: *January 9, 2012*

Subject: *OU5 Wood Chip Activity-base Sampling Summary*

Background

Operable Unit 5 (OU5) of the Site, the former Stimson Lumber Mill site, is located in the eastern portion of Libby. Historically, a variety of wood treatment and lumber milling processes were performed at OU5. The majority of lumber production activities ceased in 2003. Several wood chip piles from historical lumber processing activities were left at OU5. Wood chips from these piles have been sold and given away for use as landscaping mulch in gardens, flowerbeds, playgrounds, etc.

Results from previous sampling events indicate that Libby amphibole asbestos (LA) is present within the wood chip material (CDM 2008). However, results based on this qualitative analysis method do not provide information on whether or not disturbances of wood chips under typical residential disturbance scenarios would result in unacceptable inhalation exposures.

In August 2011, the United States Environmental Protection Agency EPA and its contractors conducted activity-based sampling (ABS) over a subset of the wood chip material. The primary goal of this study was to answer the question:

> *"Do concentrations of LA in air within the breathing zone of individuals that disturb OU5-derived wood chip materials exceed risk-based levels of concern?"*

The data collected during this event will be used to estimate exposure and risk from LA due to disturbances of wood chips derived from the OU5 wood chip piles, and to determine whether response actions are needed to protect individuals from unacceptable risks.

Sample Collection Summary

ABS was completed in August 2011 in accordance with the 2011 Miscellaneous ABS Sampling Analytical Plan (ABS SAP) (CDM 2011). Due to the potential variability in LA levels within the wood chips, material was evaluated from five separate sub-locations and varied depths across

the existing wood chip at OU5. Figure 1 indicates the approximate location of the five wood chip material draws. To begin the event, approximately two cubic yards of wood chips were collected from the five locations and transported to a neutral location on OU5, near the former plywood plant. The wood chips were then spread out on plastic sheeting. The wood chips were then allowed to dry for a minimum of 24 hours prior to the start of sampling activities. Soil moisture readings were not collected as part of this event as the soil moisture meter was unable to accurately read moistures within the wood chip material, as documented within a field modification to the ABS SAP (CDM 2011). In addition, wood chip samples were collected during dry and warm weather conditions in August.

A total of three ABS events were conducted over each of the five wood chip piles. At the start of each event, one 30-point composite sample of wood chips was collected. The wood chips were then shoveled into a pile near the center of the plastic sheeting.

Two ABS air samples (high volume primary and low volume backup) were then collected while scripted activities were conducted over a one hour period. These activities were conducted in accordance with Appendix A of the ABS SAP (CDM 2011) and included:

1. Spread the wood chips out using a long handled shovel – 10 minutes
2. Rake the wood chips out to approximately 10 feet by 10 feet by 6 inch deep – 20 minutes
3. While seated, dig with a trowel at 6 separate locations – 30 minutes (6 minutes at each location)

After completing three events over each pile, the wood chip material was returned to the approximate location where it was originally retrieved from.

Analytical Summary and Results

Wood chip ABS was completed August 30, 2011. Bulk material samples and air samples were submitted for analysis as outlined in the ABS SAP.

Wood chip samples were prepared in accordance with Section 6.0 of Standard Operating Procedure (SOP) DUFF-LIBBY-OU3. The resulting filters were analyzed for LA using Transmission Electron Microscopy (TEM) in basic accordance with International Organization for Standardization (ISO) 10312:1995(E) (ISO 1995) protocols, except that the aspect ratio criterion will be 3:1 to allow for the estimation of phase contrast microscopy – equivalent. In addition, all project specific modifications were applied. Results for the wood chip samples are presented in Table 1.

ABS air samples were analyzed for LA using TEM in basic accordance with ISO 10312:1995(E) (ISO 1995) and all applicable project-specific laboratory modifications. The analytical sensitivity

was sufficient to support risk-based decisions based on the draft toxicity values for LA. Results for the ABS air samples are presented in Table 2.

One bulk wood chip sample result indicated the presence of LA (1/15), while all other wood chip samples were non-detect. All of the ABS air sample results were non-detect for LA (0/15). Based on the wood chip ABS sampling data, disturbance of the wood chips did not result in detectable fiber emissions from the material and thus the EPA determined there was no potential human exposure to LA from the material. Without fibers being detected, risks were not estimated as there was no exposure.

References

CDM. 2008. Final Sampling Summary Report 2007 Investigations Operable Unit 5 – Former Stimson Lumber Company. July 25.

___. 2011. Sampling and Analysis Plan 2011 Miscellaneous Activity-based Sampling, Revision 1. September.

ISO. 1995. International Organization for Standardization Ambient Air. Determination of asbestos fibres – Direct-transfer transmission electron microscopy method. ISO 10312:1995(E). http://www.iso.org/iso/catalogue_detail.htm?csnumber=18358

Table 1:

2011 OU4 MISCELLANEOUS ACTIVITY-BASED SAMPLING WOOD CHIP RESULTS

SCENARIO 3: OU5 WOOD CHIP DISTURBANCE ACTIVITIES

Wood Chip Material Draw	Event #	Index ID	Sample Mass (g dw)	Ashed Residue Mass (g dw)	EFA (mm^2)	GOs Counted	GO Area (mm^2)	Ashed residue mass (g), aliquot used in dilution	Resusp. volume (mL)	Volume applied to filter (mL)	F-factor	Sensitivity (1/g)	N LA Structures Observed	LA Conc. (s/g dw)	Est. LA Conc. (mass %)
1	1	**EX-30201**	12.68	0.11	1280	4	0.013	0.05	100	1	4.5E-03	4.3E+05	**0**	**0.0E+00**	**0.0%**
	2	**EX-30202**	24.45	0.28	1280	4	0.013	0.15	100	0.8	4.3E-03	2.3E+05	**1**	**2.3E+05**	**0.000012%**
	3	**EX-30203**	51.94	0.74	1280	4	0.013	0.25	100	0.5	1.7E-03	2.8E+05	**0**	**0.0E+00**	**0.0%**
2	1	**EX-30209**	35.52	0.5	1280	4	0.013	0.25	100	0.5	2.5E-03	2.8E+05	**0**	**0.0E+00**	**0.0%**
	2	**EX-30210**	48.78	0.9	1280	4	0.013	0.25	100	0.5	1.4E-03	3.6E+05	**0**	**0.0E+00**	**0.0%**
	3	**EX-30211**	47.45	0.52	1280	4	0.013	0.25	100	0.5	2.4E-03	2.2E+05	**0**	**0.0E+00**	**0.0%**
3	1	**EX-30205**	64.04	1.22	1280	4	0.013	0.25	100	0.5	1.0E-03	3.8E+05	**0**	**0.0E+00**	**0.0%**
	2	**EX-30207**	72.69	1.43	1280	4	0.013	0.25	100	0.5	8.7E-04	3.9E+05	**0**	**0.0E+00**	**0.0%**
	3	**EX-30208**	50.7	0.83	1280	4	0.013	0.25	100	0.5	1.5E-03	3.2E+05	**0**	**0.0E+00**	**0.0%**
4	1	**EX-30212**	46.47	4.36	1280	4	0.013	0.25	100	0.5	2.9E-04	1.8E+06	**0**	**0.0E+00**	**0.0%**
	2	**EX-30213**	43.58	12.77	1280	4	0.013	0.25	100	0.5	9.8E-05	5.8E+06	**0**	**0.0E+00**	**0.0%**
	3	**EX-30214**	38.88	9.43	1280	4	0.013	0.25	100	0.5	1.3E-04	4.8E+06	**0**	**0.0E+00**	**0.0%**
5	1	**EX-30215**	48.69	0.8	1280	4	0.013	0.25	100	0.5	1.6E-03	3.2E+05	**0**	**0.0E+00**	**0.0%**
	2	**EX-30216**	56.15	0.74	1280	4	0.013	0.25	100	0.5	1.7E-03	2.6E+05	**0**	**0.0E+00**	**0.0%**
	3	**EX-30217**	67.86	1.28	1280	4	0.013	0.25	100	0.5	9.8E-04	3.7E+05	**0**	**0.0E+00**	**0.0%**
		Field Duplicates													
		EX-30204	49.05	0.81	1280	4	0.013	0.25	10	0.5	1.5E-02	3.3E+04	**0**	**0.0E+00**	**0.0%**
		EX-30206	71.78	1.33	1280	4	0.013	0.25	10	0.5	9.4E-03	3.6E+04	**0**	**0.0E+00**	**0.0%**
		Laboratory QC Analyses													
		Lab Blank	---	---	1280	10	0.013				1.0E+00	---	**0**	**---**	**---**
												1.1E+06	**mean:**	**1.6E+04**	**0.0000008%**

Note:
dw = dry weight
g = gram
GO = grid openeing
ID = identification
LA = Libby amphibole asbestos
mm^2 = square milimeters
mL = mililiter
N = number

Table 2:

2011 OU4 MISCELLANEOUS ACTIVITY-BASED SAMPLING AIR RESULTS

SCENARIO 3: OU5 WOOD CHIP DISTURBANCE ACTIVITIES

Wood Chip Material Draw	Event #	ABS Air Sample ID*	Sample Collection Date	Sample Collection Time	Sample Air Volume (L)	Number Grid Openings Examined	Analysis Sensitivity** (1/cc)	Number of PCME LA Structures	PCME LA ABS Air Conc. (s/cc)
1	1	EX-30222	8/24/11	9:11 AM - 10:12 AM	347	200	0.00043	0	0.0
	2	EX-30223	8/24/11	10:43 AM - 11:43 AM	341	200	0.00043	0	0.0
	3	EX-30226	8/24/11	1:53 PM - 2:53 PM	341	200	0.00043	0	0.0
2	1	EX-30238	8/25/11	8:51 AM - 9:51 AM	332	105	0.00085	0	0.0
	2	EX-30241	8/25/11	10:16 AM - 11:16 AM	328	105	0.00086	0	0.0
	3	EX-30243	8/25/11	3:10 PM - 4:10 PM	328	200	0.00045	0	0.0
3	1	EX-30231	8/24/11	3:15 PM - 4:15 PM	341	105	0.00083	0	0.0
	2	EX-30235	8/24/11	4:55 PM - 5:55 PM	338	105	0.00083	0	0.0
	3	EX-30237	8/24/11	6:28 PM - 7:28 PM	328	105	0.00086	0	0.0
4	1	EX-30245	8/25/11	4:20 PM - 5:20 PM	328	200	0.00045	0	0.0
	2	EX-30248	8/26/11	8:27 AM - 9:27 AM	335	200	0.00044	0	0.0
	3	EX-30250	8/26/11	9:45 AM - 10:45 AM	338	200	0.00044	0	0.0
5	1	EX-30252	8/30/11	1:47 PM - 2:47 PM	328	200	0.00045	0	0.0
	2	EX-30254	8/30/11	3:16 PM - 4:16 PM	328	200	0.00045	0	0.0
	3	EX-30256	8/30/11	4:35 PM - 5:35 PM	328	105	0.00086	0	0.0

*High volume filter was able to be directly prepared for all samples.

**Target analysis sensitivity changed from 0.00044 to 0.00088 cc^{-1} during the course of the analyses.

Note:

ABS = activity-based sampling

cc = cubic centimeters

Conc. = concentration

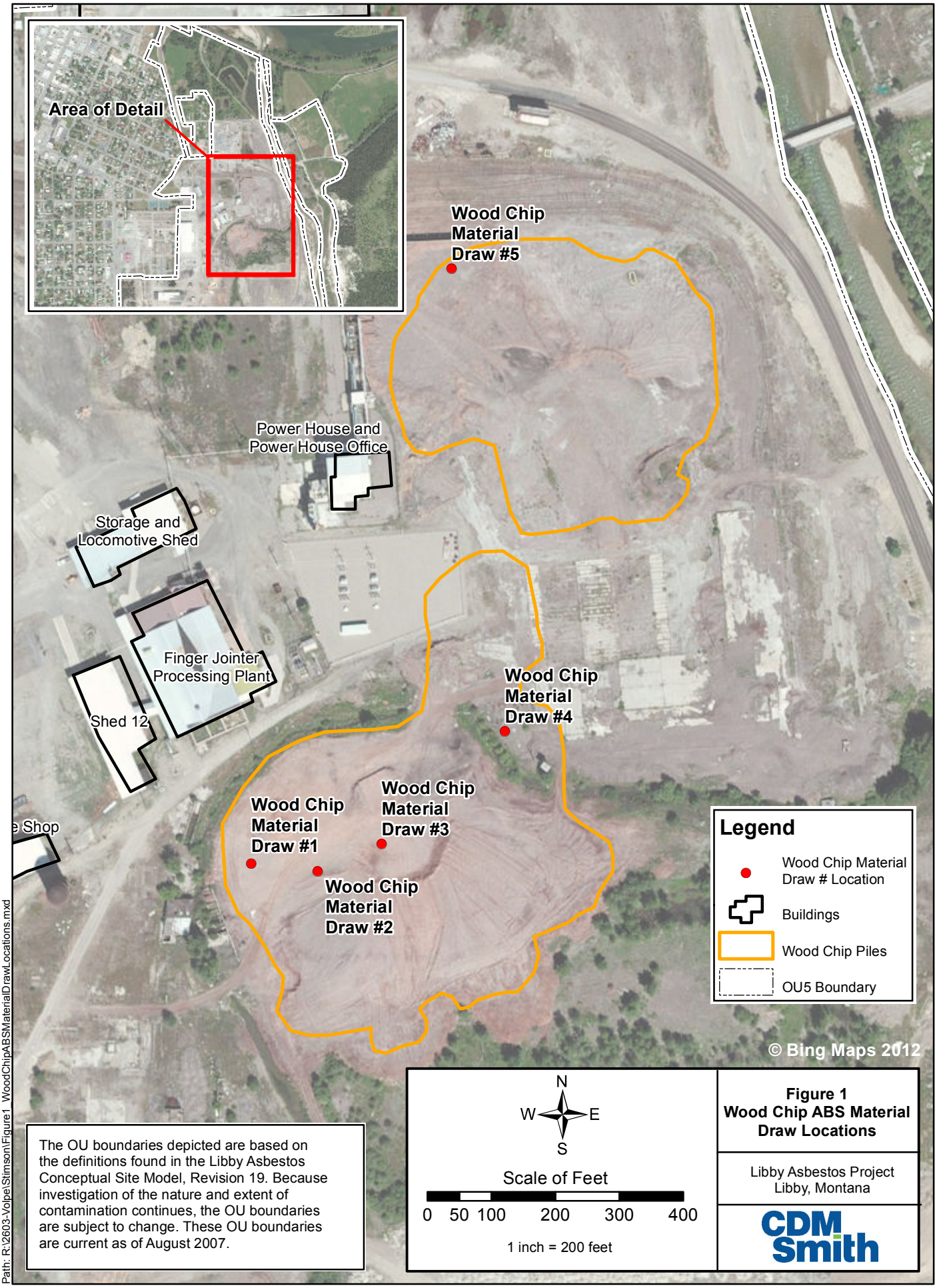
ID = identification

L = liters

LA = Libby amphibole

PCME = phase contrast microscopy equivalent

s/cc = structures per cubic centimeter



The OU boundaries depicted are based on the definitions found in the Libby Asbestos Conceptual Site Model, Revision 19. Because investigation of the nature and extent of contamination continues, the OU boundaries are subject to change. These OU boundaries are current as of August 2007.

Figure 1
Wood Chip ABS Material Draw Locations

Libby Asbestos Project
Libby, Montana

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