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MEMORANDUM

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REF. NO.: 056394-06-0001

FROM: Greg Carli
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JQ

DATE: November 9, 2011

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US EPA RECORDS CENTER REGION 5
421883

RE: **Proposed Modifications to Human Health and Ecological Risk Assessments**
Remedial Investigation Report
Former Plainwell, Inc. Mill Property
Plainwell, Michigan

Conestoga-Rovers & Associates (CRA), on behalf of, Weyerhaeuser Company (Weyerhaeuser) prepared a Remedial Investigation (RI) Report for the former Plainwell, Inc. Mill Property located at 200 Allegan Street in Plainwell, Michigan (Site). The RI Report was prepared in accordance with the terms of the consent decree for the Design and Implementation of Certain Response Actions at Operable Unit No. 4 and the Plainwell, Inc. Mill Property Operable Unit No. 7 of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (Consent Decree), which became effective February 22, 2005. The RI Report was submitted to the United States Environmental Protection Agency (U.S. EPA) on June 20, 2011.

CRA and Weyerhaeuser participated in a conference call with representatives from U.S. EPA, Michigan Department of Environmental Quality (MDEQ), and SulTRAC, on September 28, 2011 to discuss preliminary agency comments on the RI Report. During the conference call, U.S. EPA and MDEQ provided preliminary comments relating to the Human Health Risk Assessment (HHRA) presented in the RI Report and suggested modifications to the HHRA approach. A subsequent conference call was conducted on October 28, 2011, which also included risk assessors from CRA, SulTRAC, and Camp, Dresser & McKee (CDM) (on behalf of MDEQ), to further discuss proposed modifications to the HHRA, as well as the Ecological Risk Assessment (ERA), approach presented in the RI.

The purpose of this memorandum is to present a proposed modified approach to the HHRA and ERA portions of the RI Report. The proposed modifications take into consideration the current conceptual plan for redevelopment of the Site, and U.S. EPA/MDEQ comments discussed during the September and

October 2011 conference calls. The refinement of Site redevelopment areas will allow a more Site-specific approach to be applied to both the HHRA and ERA, while providing flexibility in the apportionment of risk associated with future land use areas. It is understood that if the currently anticipated land uses should change, that further modifications to the HHRA and ERA may be necessary in the future to take the changes into consideration. Figure 1 presents the current Conceptual Mill Redevelopment Plan.

Human Health Risk Assessment

The HHRA presented in the June 20, 2011 RI Report was conducted based on the separation of the Site into three areas (Area 1, Area 2, and Area 3), consistent with the approach applied in the Site characterization. The human health conceptual Site model was developed based on the most sensitive land use within each area (i.e., residential or commercial). Chemicals of potential concern (COPCs) for each medium within each of the three areas were identified based on a comparison of the maximum detected concentrations to the Generic Residential and Non-Residential Cleanup Criteria and Screening Levels established in Part 7 of Administrative Rules, effective March 25, 2011, pursuant to Part 201, Environmental Remediation, 1994 PA 451 as amended (Part 201 GRCC). Risks/hazards were calculated for each COPC using the maximum detected concentrations as the exposure point concentrations (EPCs). Although using the maximum detected concentrations is considered to be an overly conservative method of evaluation, this approach was considered reasonable under the assumption that a single family dwelling could be constructed in the vicinity of the maximum concentration; and, therefore, the assumed occupants could be exposed to the maximum concentration. Cumulative risks/hazards were calculated and compared to the target carcinogenic risk of 10^{-4} and target hazard index (HI) of 1.0 to identify the major contributors to risk/hazard.

Since submission of the RI Report, the redevelopment areas of the Site have been refined, as shown on Figure 1. Given this further definition, a more Site-specific approach can be applied in the HHRA.

The following revisions to the HHRA are proposed:

1) Revise the human health conceptual site model (CSM) consistent with the redevelopment areas that are identified on Figure 1 and using the most sensitive land use designation for those areas that are identified as mixed land use.
2) Analytical data for each of the redevelopment areas identified on Figure 1 will be separated and screened to the Part 201 GRCC to identify the human health COPCs for each redevelopment area.
3) Calculate a 95 percent upper confidence limit (UCL) of the mean for each COPC identified in 2) above using U.S. EPA's ProUCL 4.0 statistical software. This 95 percent UCL of the mean concentration will be applied as the EPC for the reasonable maximum exposure (RME) and central tendency (CT) scenarios.
4) Re-calculate carcinogenic risks and non-carcinogenic hazards for each COPC identified in 2) above using the EPCs calculated in 3) above.
5) Re-identify the major contributors to risk/hazard as those COPCs with calculated carcinogenic risks above 1.0×10^{-6} and HIs above 1.0.

Ecological Risk Assessment

Similar to the HHRA, the screening level ecological risk assessment (SLERA) presented in the June 20, 2011 RI Report was conducted based on the separation of the Site into the three Site characterization areas (Area 1, Area 2, and Area 3), and consisted of Steps 1 and 2 of the U.S. EPA 8-step process for conducting ERAs (U.S. EPA, 1997). The maximum concentration of each constituent detected in surficial soil within each of three sub-areas was compared to an ecological screening value (ESV). For constituents that were not detected, the range of detection limits for each constituent was compared to its ESV. A constituent was identified as a constituent of potential ecological concern (COPEC) if: the maximum detected concentration was greater than its ESV; the constituent was identified as a bioaccumulative COPEC and the ESV was not based on avian or mammalian receptors; the constituent was detected and an ESV is not available; or the constituent was not detected, but detection limits for more than 20 percent of the samples were greater than its ESV.

As discussed during the conference call on October 28, 2011, a more Site-specific approach can be applied in the ERA. Steps 1 and 2 that were performed in the SLERA presented in the RI Report are intentionally conservative in order to avoid incorrectly dismissing the potential for risk at the screening level. The revised RI Report will include refinement of the constituents identified in the SLERA as COPECs, a process commonly referred to as Step 3a of the U.S. EPA 8-step process. This refinement in Step 3a will consider frequency of detection (FOD), exposure concentrations other than the maxima, specific receptor groups (terrestrial plants, soil invertebrates, avian receptors, and mammalian receptors), alternative ecological benchmarks, and background concentrations of metals. The objective of the refinement process is to focus the potential future baseline ERA and data collection on those constituents, exposure pathways, and receptors that pose the greatest potential for risk.

The following revisions and additions to the ERA are proposed:

1) Verify and revise, if appropriate, the ESVs presented in the original RI Report (this is based on a comment regarding the ESVs during the October 28, 2011 conference call). The data set of surficial soil samples will be re-allocated to individual development areas based on the current Conceptual Mill Redevelopment Plan presented on Figure 1 and re-screened for the each development area.
2) Re-screen soil data based on the refined development plan.
3) Refine constituents carried forward in the screening process based on FOD. Constituents will be eliminated from further evaluation if the FOD within a development area is 5 percent or less, provided a minimum of 20 samples are available for inclusion in the evaluation.
4) Evaluate the potential for risk to specific receptor groups. Whereas the screening process considered only the most sensitive receptor group, the refinement process will evaluate risk to terrestrial plants, soil invertebrates, avian receptors, and mammalian receptors. Ecological benchmarks specific to these four receptor groups are available for many, if not most, of the constituents identified as COPECs. For metals, background concentrations will be considered. Only those benchmarks above natural background concentrations for Michigan will be used in the refinement process. Because terrestrial plants and soil invertebrates have limited to no motility, concentrations of COPECs in individual samples will be compared to the refinement benchmarks for these receptors.

5) Re-evaluate the potential for risk to avian and mammalian receptors based on 95 percent UCL concentrations. For avian and mammalian receptors, 95 percent UCLs calculated using ProUCL will be used as exposure concentrations and to calculate concentrations in food. If ecological soil screening levels (ECO-SSLs) are available for avian and mammalian receptors, the 95 percent UCLs will be compared to the ECO-SSLs specific to avian and mammalian receptors. If an ECO-SSL is not available, food chain models will be used to evaluate risk. If a 95 percent UCL exceeds an ECO-SSL, food chain models will also be used to further evaluate risk, as ECO-SSLs were developed for the screening rather than refinement.

6) Re-evaluate the potential for risk to avian and mammalian receptors based on ecologically realistic and Site-specific exposure factors. For the refinement process, the food chain models will be based, to the extent possible, on realistic and Site-specific assumptions regarding exposure and area use. Avian and mammalian species likely to be present on or adjacent to the Site will be selected as representative indicator species (also referred to as receptors of concern [ROCs]) for herbivores, insectivores, and carnivores. To reduce uncertainty in the refinement process, selection of indicator species will be based on available of toxicity reference values (TRVs) and exposure factors, such are rates of ingestion for food, water, and incidental soil, and home range size. As stated above, 95 percent UCL will be used as exposure concentrations to calculation concentrations in food. As most avian mammalian receptors are not pure herbivores, insectivores, or carnivores, the proportion of plant material, soil invertebrates, and other vertebrates (i.e., small mammals) in the diets of the indicator species will be based on values identified in applicable guidance documents (e.g., U.S. EPA, 1993, 1999). Total ingestion will be adjusted for seasonal and area use. Both no observed adverse effects levels (NOAELs) and lowest observed adverse effects levels (LOAELs) will be considered in evaluating risk.

7) Evaluate the potential for risk posed by COPECs that lack ESVs. For those constituents carried forward as COPECs because they were detected but do have an available ESV, benchmarks for surrogate chemicals with similar chemical and toxicological properties will be identified. It should be noted that some of the constituents in this category may be eliminated based on FOD.

8) Re-evaluate the potential for risk posed by constituents that were not detected. For those constituents that, although not detected, were carried forward as COPECs because greater than 20 percent of the detection limits exceeded their ESVs, alternative ecological benchmarks will be considered. Presence in other Site media (e.g., groundwater or deep soil) and use in historical Site operations will also be considered.

Summary

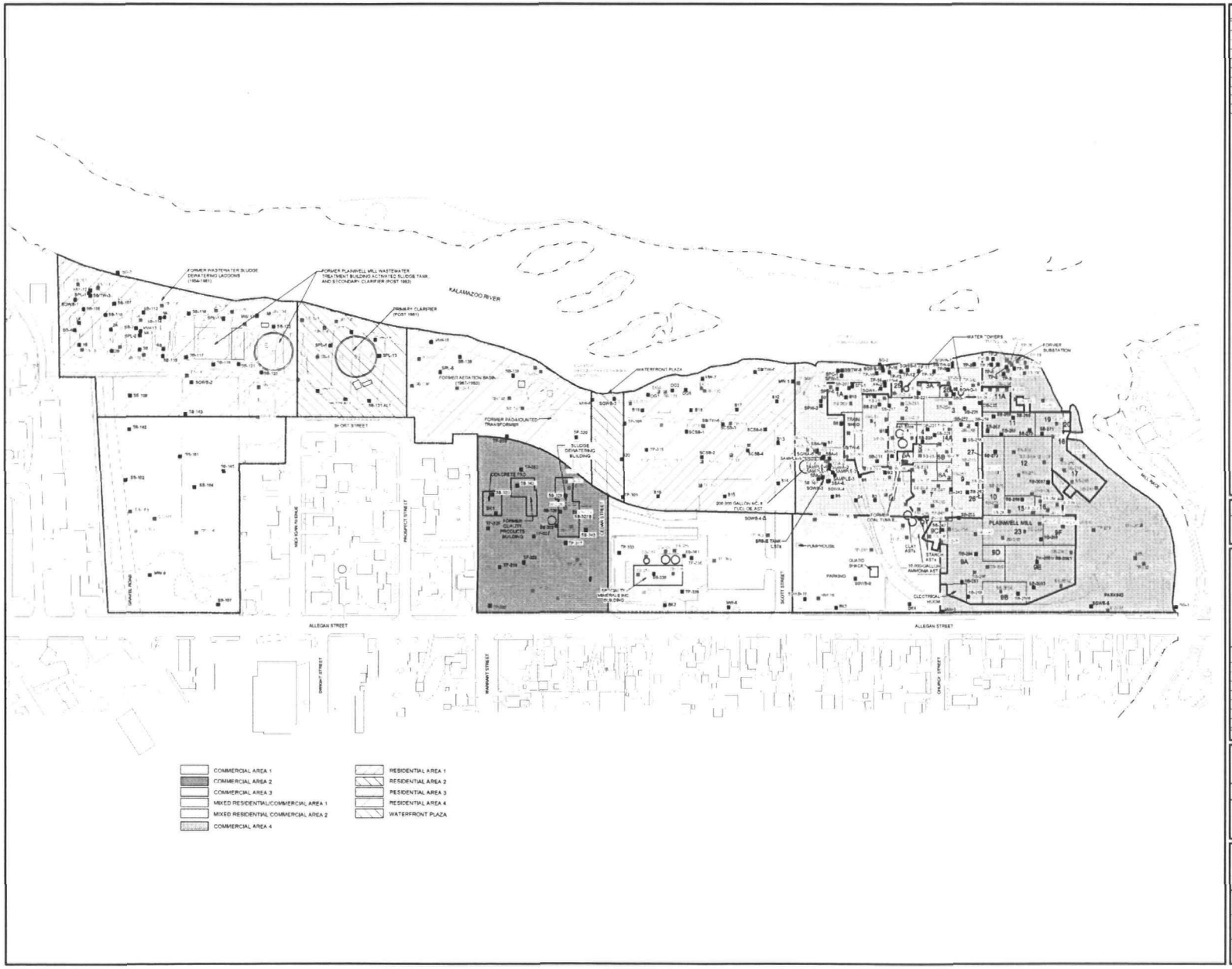
Weyerhaeuser appreciates your consideration of the above proposed modifications to the approach for the HHRA and ERA. Based on our previous discussions and the above clarification on the proposed modified approach, it is anticipated that the U.S. EPA and MDEQ will review the revised HHRA and ERA approach and provide comments on the approach with the comments submitted to Weyerhaeuser on the RI Report.

References

U.S. EPA. 1993. Wildlife Exposure Handbook. Office of Research and Development. EPA/600/R-193/187.

U.S. EPA. 1997. Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessment.

U.S. EPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Office of Solid Waste and Emergency Response. EPA/530-D-99-001A.



NO	Revision	Date	Initial

0 60 120ft

LEGEND

- PROPERTY BOUNDARY
- TREE LINE
- FENCE LINE
- RAILROAD SPUR
- SURFACE WATER

- EXCEEDANCE OF PART 201 RESIDENTIAL DIRECT CONTACT CRITERIA
- EXCEEDANCE OF PART 201 NON-RESIDENTIAL DIRECT CONTACT CRITERIA
- EXCEEDANCE OF PART 201 RESIDENTIAL SOIL VOLATILIZATION TO INDOOR AIR CRITERIA
- EXCEEDANCE OF PART 201 NON-RESIDENTIAL SOIL VOLATILIZATION TO INDOOR AIR CRITERIA
- EXCEEDANCE OF PART 201 RESIDENTIAL PARTICULATE SOIL INHALATION CRITERIA
- EXCEEDANCE OF PART 201 NON-RESIDENTIAL PARTICULATE SOIL INHALATION CRITERIA
- NO EXCEEDANCE OF PART 201 CLEANUP CRITERIA OR EXCEEDANCE OF DRINKING WATER PROTECTION CRITERIA, GROUNDWATER SURFACE WATER INTERFACE PROTECTION CRITERIA, DRINKING WATER CRITERIA, OR GROUNDWATER SURFACE WATER INTERFACE CRITERIA
- EXCEEDANCE OF PART 201 NON-RESIDENTIAL DIRECT CONTACT CRITERIA AND NON-RESIDENTIAL PARTICULATE SOIL INHALATION CRITERIA

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

CONCEPTUAL REDEVELOPMENT PLAN

PLAINWELL, MICHIGAN

FORMER PLAINWELL, INC. MILL PROPERTY

CONESTOGA-ROVERS & ASSOCIATES

Source Reference

Project Manager	Reviewed By	Date
G.C.	J.Q.	NOVEMBER 2011

Scale	Project N/#	Report N/#	Drawing N/#
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