MEMORANDUM

Project No.: 110207-006-02

March 6, 2017

To: Andy Kallus, Washington State Department of Ecology

cc: Cindy Jernigan and Bryan Lust, Kimberly-Clark

From:

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Re: **RI/FS Work Plan Addendum: Wet Season 2017 Groundwater Monitoring**
Kimberly-Clark Worldwide Site Upland Area RI/FS, Everett, Washington

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Aspect Consulting, LLC (Aspect) has prepared this Addendum to the Remedial Investigation/Feasibility Study (RI/FS) Work Plan for the Kimberly-Clark (K-C) Worldwide Site Upland Area (Aspect, 2013) to present the scope of work and schedule for a supplemental round of wet season groundwater monitoring in early 2017.

The Upland Area draft RI submitted in March 2016 includes groundwater data collected between 2012 and February 2016 that document elevated pH and associated elevated dissolved metals in some areas of the Upland Area in relation to the onsite reuse of crushed material (CM) generated from mill demolition. After submittal of the draft RI, two rounds of groundwater monitoring conducted in May and August 2016 indicate generally lower groundwater pH than observed in February 2016, which is consistent with a gradual reduction in groundwater pH observed across most of the site since February 2014. However, following the onset of the 2017 wet season, another groundwater monitoring event is warranted to assess groundwater quality changes relative to the 2016 wet season and longer term, in support of the draft final RI/FS. In addition, the sampling event will include groundwater sampling and analysis of polycyclic aromatic hydrocarbons (PAHs) and

polychlorinated biphenyl (PCB) congeners in select areas where concentrations of those compounds are highest in the CM and/or soil.

The proposed work includes groundwater sampling and analysis of select monitoring wells in accordance with the Sampling and Analysis Plan (SAP), Appendix A of the RI/FS Work Plan (Aspect, 2013). Figure 1 depicts the proposed groundwater monitoring locations.

Sampling and Analysis

The sample locations, procedures and analysis for the wet season 2017 monitoring event are provided below.

Sampling Locations

The sampling locations are depicted on Figure 1 and include a combination of shoreline wells and interior monitoring wells located within the CM footprint. The sampling event will consist of collection and laboratory analysis of groundwater samples from 52 monitoring wells. The monitoring wells were primarily selected based on their locations relative to the CM, previous results of groundwater pH, previous results of PAHs and PCB congeners in the CM and/or soil, as well as provide coverage of the entire shoreline. The sampling will include the following:

- A total of 54 wells for analysis of metals and field measurement of pH;
- Six wells for analysis of PAHs; and
- Eight wells for PCB congeners.

The well locations and analytical approach are depicted on Figure 1 and summarized on Table 1.

Sampling Procedures and Schedule

The sampling procedures will include measurement of water levels in each of the monitoring wells and collection of groundwater samples for laboratory analysis using standard, low-flow well purging and sampling procedures. The water level measurements will be collected in accordance with the procedures described in Section A2.7 of the SAP. The groundwater sampling will be completed in accordance with the procedures described in Section A2.4 of the SAP. Per those procedures, the groundwater samples for dissolved metals analysis will be field filtered using an in-line 0.45 micrometer filter. Sample custody, field documentation and equipment decontamination will be completed in accordance with Sections A2.6.1, A2.6.2 and A2.9 of the SAP, respectively.

In accordance with the SAP, groundwater samples collected from wells within 200 feet of the East Waterway shoreline will be sampled within 2 hours before or 3 hours after a lower low tide. The designated shoreline wells will be sampled within 1 hour before or after lower low tide.

Based on the upcoming tide predictions, the groundwater monitoring and sampling event will be conducted on March 7-9, 2017 with nighttime sampling of shoreline wells on March 8 and 9.

Sample Analysis

The groundwater samples collected during this monitoring event will be tested or analyzed for the following:

- Field parameters consisting of temperature, pH, dissolved oxygen, oxidation-reduction potential (ORP), specific conductance and turbidity.

- Dissolved metals consisting of arsenic, copper, lead, mercury, nickel and zinc by EPA Methods 200.8/1631E.
- PAHs by EPA Method 8270D/SIM.
- PCB congeners by EPA Method 1668A.

The laboratory analysis for metals will be completed by ALS Environmental in Kelso, Washington. The laboratory analysis for PAHs will be completed by Friedman & Bruya in Seattle, Washington. The laboratory analysis for PCB congeners will be completed by ALS Environmental in Houston, Texas.

Quality Assurance/Quality Control

The groundwater monitoring and sampling event will be completed in accordance with the applicable quality control (QC) procedures and criteria described in the Quality Assurance Project Plan (QAPP), Section A3 of the SAP. Those procedures relevant to this groundwater monitoring and sampling event include analytical methodologies (Section A3.3); sample preparation techniques, including reductive precipitation to mitigate salinity interferences for trace metals analysis (Section A3.3.2) and centrifuge to mitigate elevated turbidity for PAH and PCB analysis (Section A.3.3.3); and collection and analysis of blind field duplicates (Section A3.5.1). Laboratory QC procedures will be conducted in accordance with the QAPP (Section A3.5.2).

Data Management and Reporting

Once validated (Level 2b per the QAPP), the new analytical data will be uploaded to Ecology's Environmental Information Management (EIM) system. The results of the groundwater monitoring and sampling event will be provided to Ecology in a summary email, with updated data tables and figures, as appropriate, and then reported as part of the draft final Upland Area RI/FS Report.

References

Aspect Consulting, 2013, Work Plan for Remedial Investigation/Feasibility Study, Kimberly-Clark Worldwide Site Upland Area, Everett, Washington, November 22, 2013, Final.

Attachments: Table 1 – 2017 Wet Season Sampling Approach
Figure 1 – Groundwater Sampling Locations for 2017 Wet Season

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Table 1 - 2017 Wet Season Sampling Approach

Project No. 110207 Kimberly-Clark Worldwide Site Upland Area RI/FS, Everett, Washington

Well Identification	Metals	PAHs	PCB Congeners
AP-MW-1R	X	X	
BA6-MW-101	X		
BA-MW-3	X		
BA-MW-5	X		
BBH-MW-101	X		
BBH-MW-102	X		
BBH-MW-103	X		
BBH-MW-104	X		
BCT-MW-102			X
BCT-MW-103	X		
BCT-MW-104	X		
BCT-MW-105	X		
BCT-MW-107	X		
BCT-MW-108	X		X
CMS-MW-1R			X
NC-MW-103			X
DAST-MW-101			X
GF11-MW-101	X		
GF9-MW-2	X		
GF9-MW-3	X	X	
GF11-MW-101	X		
HB-MW-1R	X	X	X
HBV-MW-101		X	
LP-MW-1	X		
LP-MW-2	X		
MW-2	X		
MW-6	X		
NRS-MW-102	X		
NRU-MW-102	X		
OMS-MW-1R	X		
OPS-MW-1	X		
PM-MW-4	X		
PM-MW-5	X		
PM-MW-6	X		
PM-MW-7	X		
PM-MW-8	X		
RCD-MW-101	X		
REC1-MW-3	X		
REC3-MW-1R	X		
REC5-MW-1R	X		
REC6-MW-2	X		
REC7-MW-2	X		
REC7-MW-3	X		
REC7-MW-4	X		
SHB-MW-101	X		
SHB-MW-2	X		
TM-MW-2	X		
TM-MW-3	X		
TM-MW-4	X		
TM-MW-5	X		
TM-MW-6	X		
UG-MW-2R	X	X	X
UST29-MW-101	X		
UST29-MW-103	X	X	X
UST70-MW-102	X		
UST70-MW-2	X		
UST71-MW-101	X		
UST71-MW-103	X		
UST71-MW-104	X		

PAHs = polycyclic aromatic hydrocarbons

PCB = polychlorinated biphenyls

CN-MW-3
CN-MW-2
CN-MW-1
REC7-MW-1
EXISTING CLARIFIER
EXISTING SECONDARY AERATION BASINS
NRP-MW-3
MW-5
NRU-MW-102
NRP-MW-2
NRU-MW-101
NRS-MW-101
NRS-MW-102
UG-MW-1
CONVERTING ADDITION
PARENT ROLL STORAGE
CN-MW-101
CN-MW-104
TM-MW-1
CN-MW-102
CN-MW-103
TM-MW-2
TM-MW-3
REC7-MW-2
TM-MW-5
TISSUE MANUFACTURING
TM-MW-6
EXISTING PUD ELECTRICAL SUBSTATION
TM-MW-4
CONVERTING/FINISHING
PULP MILL
REC6-MW-2
UST29-MW-101
UST29-MW-102
UST29-MW-103
HBV-MW-101
MW-6
WOOD CHIPS PILE
LP-MW-2
LP-MW-1
WOOD CHIPS PILE
HB-MW-1R
HYDRAULIC BARKER BUILDING
SHB-MW-101
SHB-MW-102
CHIP SILOS
GF9-MW-3
GF9-MW-4
SHB-MW-2
GF9-MW-2
UG-MW-2R
AP-MW-1R
RCD-MW-101
BA-MW-5
REC5-MW-1R
BA-MW-1
BA-MW-2
ACID PLANT
PRIMARY CLARIFIERS
BA6-MW-101
UST70-MW-101
UST71-MW-101
UST70-MW-2
UST71-MW-104
UST70-MW-102
NO. 14 BOILER
FILTER PLANT
UST71-MW-102
BA-MW-3
BA-MW-4
UST71-MW-103
COOLING TOWER
REC3-MW-1R
BBH-MW-101
BBH-MW-103
GF11-MW-101
OPS-MW-1
BBH-MW-102
BBH-MW-104
PM-MW-3
DIGESTER BUILDING
PM-MW-8
PM-MW-6
PM-MW-1
REPULPER STORAGE BUILDING
PULP STORAGE BUILDING
BLOW PIT BUILDING
WASHER BUILDING
CMS-MW-1R
CMS-MW-2
PM-MW-2
PM-MW-5
PULP DRYING BUILDING
SCREEN AND BLEACH 1
SCREEN AND BLEACH 2
PM-MW-4
PM-MW-7
DAST-MW-101
TRAIN SHED
BCT-MW-108
REC7-MW-3
OMS-MW-2
OLD MACHINE SHOP
BCT-MW-107
UST68-MW-5
OMS-MW-1R
BCT-MW-106
BCT-MW-103
MW-1
BCT-MW-105
BCT-MW-102
MW-2
BCT-MW-104
BCT-MW-101
REC1-MW-4
REC1-MW-3
REC1-MW-12
REC1-MW-1
REC7-MW-4
REC1-MW-15
REC1-MW-14
REC1-MW-2
REC1-MW-9
REC1-MW-10
STING DISTRIBUTION WAREHOUSE
REC1-MW-5
REC1-MW-8
REC1-MW-7
REC1-MW-6
REC1-MW-11
EVERETT AVENUE EASEMENT

Monitoring Well

Sample Type (Wet Season, 2017)

- Metals/pH
- PAHs
- PCB Congeners
- Metals/pH and PAHs
- Metals/pH and PCB Congeners
- Metals/pH, PAHs, and PCB Congeners

- 200' Shoreline Buffer
- Former Log Pond
- Crushed Material Boundary
- Site Unit Dividers
- Upland Area Boundary
- Interim Action Excavation Extent
- Historical Site Features

0 100 200
Feet

Groundwater Sampling Locations for 2017 Wet Season

K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING	MAR-2017	BY: CEB / RAP	FIGURE NO. 1
	PROJECT NO. 110207	REVISED BY: ---	