

Work Order	4A-080A Thin Interval Core Sampling Scope Increase
MALLINCKRODT US LLC	Project Name: Penobscot River Phase III Engineering Study Project Number: 3616166052
This Work Order (“Work Order”), when approved and signed by both parties, is issued under and amends that certain Agreement between the parties executed February 2, 2016 (“Agreement”). Except as expressly modified herein, all terms and conditions of the Agreement remain in full force and effect.	

SCOPE OF SERVICES:

Amec Foster Wheeler shall perform the following services (“Services”):

- As set forth in the attached document entitled (Insert document description here).
- As described as follows:

This Work Order (WO 4A-080A) presents an increase in scope to the original Work Order 4A-080, which was approved by the US District Court on July 27, 2017. Amec Foster Wheeler will collect additional data for characterizing, quantifying, and vertically evaluating the mass and volume of stable versus unstable affected sediments found in intertidal and subtidal zones. The primary changes to the scope of the original WO 4A-080 reflected in this WO are:

- Additional LOE to develop Vibracore Standard Operating Procedure (SOP) as a result of information gleaned from discussions with Dr. Kevin Yeager regarding his methods for core collection used in 2009;
- Site visit by Kim Schindler to demonstrate coring techniques used in Phase II 2009 Dr. Yeager investigations;
- Addition of manual push or box cores to intertidal and accessible subtidal explorations (due to the need to sample the non-cohesive sediments above the intact sediments – Vibracore methods disturb the non-cohesive sediments);
- Orland River access agreements for marsh platform sample locations
- Additional LOE for sediment processing of push/box cores; and
- Additional LOE for push/box core sediment data management, validation, and interpretation.

TASK 1 – CORE COLLECTION AND TRANSPORT

Vibracore SOP. WO 4A-080 included 200 hours of labor to develop the Vibracore SOP, but the time associated with obtaining and reviewing information from Dr. Yeager and his assistant Kim Schindler regarding their procedures for core collection in 2009 has been substantially more involved. The additional LOE required to hold teleconferences and face-to-face meetings with these individuals is estimated to be 104 hours total.

Kim Schindler Site Visit. In order to receive the necessary information to match the coring techniques used by Dr. Yeager in 2009, a site visit by his assistant Kim Schindler is necessary for transfer of information and confirmation of on-site coring techniques. The cost for Ms. Schindler’s visit, Amec Foster Wheeler labor for interfacing with Ms. Schindler, and subcontractor services for demonstration of coring techniques are included in Task 1.

Orland River Access Agreements. Obtain access permission and/or agreements for six marsh platform sediment core locations in the Orland River. The LOE for this task is estimated to be 54 hours.

Push/Box Core Sampling. The increase in scope from WO 4A-080 consists of the following:

- Addition of two manual push-cores or box cores at each of the 51 proposed core locations in WO 4A-080; one core to be sectioned and analyzed, and the other to be retained as a record sample;
- Sampling and analysis of the short cores as follows:
 - 0 – 0.1 ft with analyses in priority order (depending upon analytical lab minimum sample mass) of total mercury and TOC
 - 0.1 – 0.3 ft with analyses in priority order (depending upon analytical lab minimum sample mass) of total mercury and TOC
 - 0.3 – 0.5 ft with analyses in priority order (depending upon analytical lab minimum sample mass) of total mercury and TOC



- 0.5 – 0.75 ft with analyses in priority order (depending upon analytical lab minimum sample mass) of total mercury and TOC
- 0.75 – 1 ft with analyses in priority order (depending upon analytical lab minimum sample mass) of total mercury and TOC
- Costs presented in this task include 4 additional days of sediment coring subcontractor time

TASK 2 –CORE SECTIONING & SAMPLE MANAGEMENT

The increase in scope associated with this task is for additional processing time for the push/box cores referenced under Task 1, above. Cores collected under Task 1 will be processed for chemical analysis and record storage.

TASK 3 – LABORATORY ANALYSES AND TRACKING

Analytical laboratory subcontractor costs associated with analyses specified in Task 1, as well as data validation costs, are included under this task.

COMPENSATION

The Estimated Not-to-Exceed Cost for the Services is provided in the table below:

TASK NUMBER & DESCRIPTION	ESTIMATED WORK ORDER 4A-080A PRICE						
	Total Labor Hours	Labor Price	ODCs	Travel	Subs	Equip/Supplies	TOTAL
Task 1 - Core Collection & Transport							
Task 2 - Core Sectioning & Sample Management							
Task 3 - Laboratory Analyses & Tracking							
WORK ORDER TOTALS							

- Subcontractors include AquaSurvey for sediment sampling, and Alpha/Eurofins for laboratory services. Laboratory cost includes quality control samples.
- Equipment and supply costs include those associated with boat rental, sampling equipment, and consumables items.

ATTACHMENTS

None

By their signatures below, the parties acknowledge that they shall be bound by the terms of this Work Order, including the attachments hereto, and that the undersigned are authorized to enter into this Work Order.

MALLINCKRODT US LLC

Date: 9-26-17

By: *Patricia H Duett*
 (Signature)

Name: Patricia H Duett
 (Printed Name)

Title: VICE PRESIDENT

Amec Foster Wheeler Environment & Infrastructure, Inc.:

Date: 9/25/2017

By: *Nelson Walter*
 (Signature)

Name: Nelson Walter
 (Printed Name)

Title: Vice President