

October 19, 2015

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Subject: Submittal of Deliverable – Battelle Laboratory Data for “2015 Field Season of the ANIMIDA III Program”

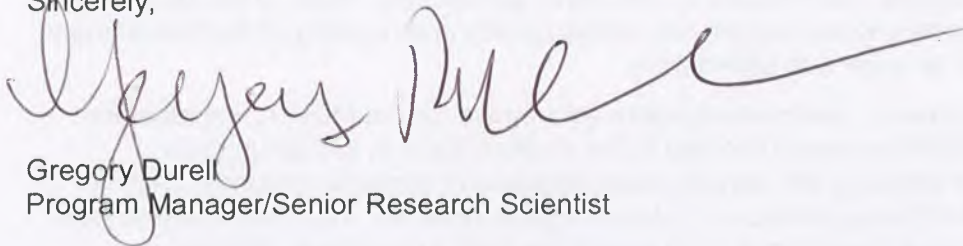
Dear Waverly,

This deliverable constitutes the second, and final, data deliverable associated with Battelle’s laboratory analytical support to the *ANIMIDA III Program*. This deliverable is comprised of the methylmercury and petroleum hydrocarbon data from the analyses of biological tissue and sediment samples collected during the summer 2015 survey (as well as some sediment core samples collected in 2014). This deliverable includes the data tables (in Excel file format) and the quality control (QC) narratives (as Word file documents), which describe the QC results. The enclosed deliverable includes the data for all the analyses conducted by Battelle; both the petroleum hydrocarbon analyses performed at Battelle’s Norwell, MA laboratory and the methylmercury analyses conducted at Battelle’s Sequim, WA laboratory.

I am sending you this deliverable via email, with the Excel and Word files as attached documents. We would be happy to also send you these files on a CD and in hard copy format, on request.

The analytical methods and results will also be summarized and reported as part of a more comprehensive document deliverable at the end of the project. If you have any questions regarding this submission, please contact Bo Lizotte at (781) 681-5566 ([lizotte@battelle.org](mailto:lizotte@battelle.org)), or me at (781) 681-5517 ([durell@battelle.org](mailto:durell@battelle.org)).

Sincerely,



Gregory Durell  
Program Manager/Senior Research Scientist

cc. Justin Blank ([justin.blank@fairweather.com](mailto:justin.blank@fairweather.com))  
Sheyna Wisdom ([sheyna.wisdom@fairweather.com](mailto:sheyna.wisdom@fairweather.com))

## ATTACHMENT 1

### Notes on Battelle's Laboratory Analyses "2015 Field Season of the ANIMIDA III Program"

- Thirty-nine (39) sediment samples, including the top segment from two sediment cores (representing the surface sediment), 11 sediment core samples collected in 2014, and two peat samples, were analyzed to determine petroleum hydrocarbon concentrations; polycyclic aromatic hydrocarbons (PAH), petroleum biomarkers (steranes and triterpanes), and saturated hydrocarbons (alkanes and isoprenoids), and total hydrocarbons. These samples were analyzed in two laboratory analytical batches, together with a series of quality control (QC) samples (procedural blank, laboratory control sample, matrix spike, matrix spike duplicate, standard reference material, North Slope crude control oil, and Northstar control oil). The quality control sample analyses met the data quality objectives (DQOs), with few exceptions. None of the DQO exceedances indicate any issues with the overall quality and usability of the data; the data can be used with confidence.
  - PAH/biomarkers. No analytes were detected above the primary DQO of <5X the MDL in any of the method blanks. All surrogate recoveries and other QC sample results met the DQOs. The QC information is described in more detail in the QA/QC Summaries.
  - Saturated HCs/Total SHC. Low concentrations (but above 5X the MDL) of decane were detected in the method blank in the one of the sediment batches, possibly contributing low sample concentrations of this compound. This is common for these compounds in trace-organic analysis. No other analytes were detected above the primary DQO of <5X the MDL in the blank, and the occasional B-qualified sample data are because of secondary DQO exceedances (blank should be <5X sample concentration), and are a reflection of very low field sample concentrations, not elevated blank concentrations. Surrogate recoveries and other QC sample results met the DQOs. The QC information is described in more detail in the QA/QC Summaries.
- Twenty-one (21) tissue samples (arctic cod, clam, and amphipod), including one field duplicate, were analyzed to determine petroleum hydrocarbon concentrations; polycyclic aromatic hydrocarbons (PAH), petroleum biomarkers (steranes and triterpanes), saturated hydrocarbons (alkanes and isoprenoids), and total hydrocarbons. The quality control sample analyses met the DQOs, with minor exceptions. None of the DQO exceedances indicate any issues with the overall quality and usability of the field sample data; the data can be used with confidence.
  - PAH/biomarkers. Low concentrations (but above 5X the MDL) of naphthalene and phenanthrene were detected in the method blank in the tissue batch, possibly contributing low sample concentrations of these compounds. This is common for these compounds in trace-organic analysis. No other analytes were detected above the primary DQO of <5X the MDL in the blank, and the occasional B-qualified sample data are because of secondary DQO exceedances (blank should be <5X sample concentration), and are a reflection of very low field sample concentrations, not elevated blank concentrations. One surrogate (Benzo(a)pyrene-d12) recovery was below the MQO criteria (40%-120%) in the

lab duplicate analysis (DUP). The relative percent differences between the DUP and the parent sample were within DQO limits for those values that could be evaluated (the sample had very low hydrocarbon concentrations, so assessment was not possible for many compounds). The remainder of the surrogate recoveries and other QC sample results met the DQOs. The QC information is described in more detail in the QA/QC Summaries.

- Saturated HCs/Total SHC. Low concentrations (but above 5X the MDL) of decane and hentriacontane were detected in the method blank in the tissue batch, as is common for these compounds in trace-organic analysis. No other analytes were detected above the primary DQO of <5X the MDL in the blank, and the occasional B-qualified sample data are because of secondary DQO exceedances (blank should be <5X sample concentration), and are a reflection of very low field sample concentrations, not elevated blank concentrations. Surrogate recoveries and other QC sample results met the DQOs. The QC information is described in more detail in the QA/QC Summaries.
- Nine (9) tissue samples (clam and amphipod) were analyzed for concentrations of methyl-mercury; one clam sample was also analyzed in duplicate. The quality control sample analyses all met the data quality objectives (DQOs).

