

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32
Material to be Sampled: LDW-SC42
Measurement Parameter: Archive sample

Standard Procedure for Field Collection & Laboratory Analysis:

Method A involves sectioning the core into a maximum of six intervals (i.e., 0-1, 1-2, 2-4, 4-6, 6-8, and 8-10 ft, depending on the length of the core recovered) and submitting the samples for the first three intervals (0-1, 1-2, and 2-4 ft) for initial chemical analyses. Samples collected from the lower three depth intervals (4-6, 6-8, and 8-10 ft) will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).

Reason for Change in Field Procedure or Analysis Variation:

Plastic debris was found at this depth interval and the sediment was not native.

Variation from Field or Analytical Procedure:

An additional archive sample was collected at the 10-12 ft interval for LDW-SC42.

Special Equipment, Materials or Personnel Required:

N/A

Initiator's Name:

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Date: 3.21.06

Project Officer:

Date: 3/22/06

QA Officer:

Date: 3.22.06

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32
Material to be Sampled: 11 subsurface locations listed below
Measurement Parameter: Archive sample

Standard Procedure for Field Collection & Laboratory Analysis:

Method A involves sectioning the core into a maximum of six intervals (i.e., 0-1, 1-2, 2-4, 4-6, 6-8, and 8-10 ft, depending on the length of the core recovered) and submitting the samples for the first three intervals (0-1, 1-2, and 2-4 ft) for initial chemical analyses. Samples collected from the lower three depth intervals (4-6, 6-8, and 8-10 ft) will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).

Reason for Change in Field Procedure or Analysis Variation:

Recovered length for each core exceeded 10 ft.

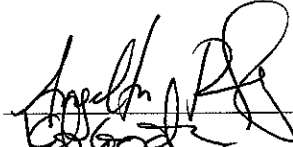
Variation from Field or Analytical Procedure:

Additional archive samples were collected at depth intervals below 10 ft for the following 11 subsurface locations: LDW-SC2, LDW-SC14, LDW-SC19, LDW-SC21, LDW-SC26, LDW-SC26, LDW-SC28, LDW-SC32, LDW-SC42, LDW-SC46, LDW-SC49, and LDW-SC201.

Special Equipment, Materials or Personnel Required:

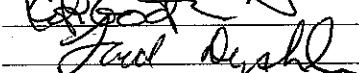
N/A

Initiator's Name:



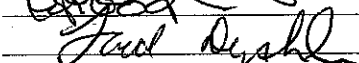
Date: 3.21.06

Project Officer:



Date: 3/22/06

QA Officer:



Date: 3.22.06

PROTOCOL MODIFICATION FORM

Project Name and Number: 05- 08-06-32

Material to be Sampled: LDW-SC53

Measurement Parameter: Chemical analyses

Standard Procedure for Field Collection & Laboratory Analysis:

Method B, sediment from 0.5ft intervals in each core will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).

Reason for Change in Field Procedure or Analysis Variation:

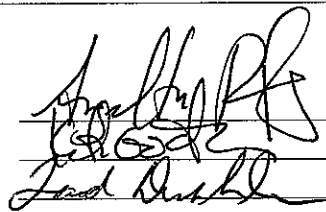
Inadvertent change in procedure.

Variation from Field or Analytical Procedure:

LDW-SC53: The 1-1.5 ft and 1.5 -2 ft archive sampling intervals were inadvertently sampled as one 1-2 ft interval. Two samples were collected from this one interval, placed in two 16 oz. jars, and labeled as LDW-SC53-1-2A and LDW-SC53-1-2B.

Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:



Date: 3.21.06

Project Officer:

Date: 3/22/06

QA Officer:

Date: 3-22-06

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32
Material to be Sampled: LDW-SC45
Measurement Parameter: Archive sample

Standard Procedure for Field Collection & Laboratory Analysis:

Method A involves sectioning the core into a maximum of six intervals (i.e., 0-1, 1-2, 2-4, 4-6, 6-8, and 8-10 ft, depending on the length of the core recovered) and submitting the samples for the first three intervals (0-1, 1-2, and 2-4 ft) for initial chemical analyses. Samples collected from the lower three depth intervals (4-6, 6-8, and 8-10 ft) will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).

Reason for Change in Field Procedure or Analysis Variation:

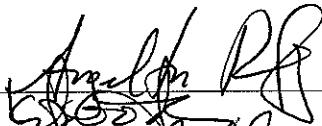
The sediment had a strong petroleum odor and an oily sheen.

Variation from Field or Analytical Procedure:

LDW-SC45: An additional discrete sample was collected from a separate core at the 5 ft interval and submitted to the laboratory as an archive sample.

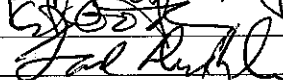
Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:




Date: 3.21.06

Project Officer:



Date: 3/22/06

QA Officer:



Date: 3.22.06

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32
Material to be Sampled: LDW-SC38
Measurement Parameter: Chemical analyses

Standard Procedure for Field Collection & Laboratory Analysis:

Method A involves sectioning the core into a maximum of six intervals (i.e., 0-1, 1-2, 2-4, 4-6, 6-8, and 8-10 ft, depending on the length of the core recovered) and submitting the samples for the first three intervals (0-1, 1-2, and 2-4 ft) for initial chemical analyses. Samples collected from the lower three depth intervals (4-6, 6-8, and 8-10 ft) will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).

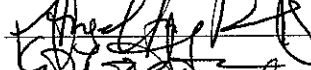

Reason for Change in Field Procedure or Analysis Variation:

To display the sediment vertical extent and characterization in the 3-3.3 ft interval that was not available in the initial core.

Variation from Field or Analytical Procedure:

LDW-SC38: An additional discrete sample was collected from a separate core for chemical analyses at the 3-3.3 ft interval.

Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:		Date:	<u>3.21.06</u>
Project Officer:		Date:	<u>3/22/06</u>
QA Officer:		Date:	<u>3.22.06</u>

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32
Material to be Sampled: LDW-SC34, LDW-SC36 and LDW-SC202
Measurement Parameter: Geotechnical analyses

Standard Procedure for Field Collection & Laboratory Analysis:

Atterberg limits, specific gravity and bulk density will be analyzed on one intact section of core per stratigraphic unit for geotechnical evaluation (Section 3.1.4 of the subsurface sediment sampling QAPP).


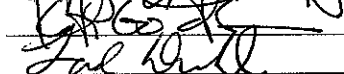

Reason for Change in Field Procedure or Analysis Variation:

LDW-SC34: Geotechnical samples were inadvertently not collected during the core logging.
LDW-SC36 and LDW-SC202: The field geologist confirmed the sediment composition was the same for the 0-1 ft, 1-2 ft and 2-4 ft intervals in each core.

Variation from Field or Analytical Procedure:

LDW-SC34: Geotechnical samples were not collected.
LDW-SC36 and LDW-SC202: Only one geotechnical sample was collected at the 2-4ft interval in each core.

Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:		Date:	<u>3.21.06</u>
Project Officer:		Date:	<u>3/22/06</u>
QA Officer:		Date:	<u>3-22-06</u>

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32

Material to be Sampled: Several samples as listed below

Measurement Parameter: Archive sample

Standard Procedure for Field Collection & Laboratory Analysis:

For cores processed using Method B as described in Section 3.1, the uppermost 6 ft of half of the core will be sub-sectioned into 0.5ft sampling intervals. However, the size of the sampling interval will not be less than 0.5ft in order to obtain sufficient volume of sediment for chemical analyses (Section 3.2.4 of the subsurface sediment sampling QAPP).

Reason for Change in Field Procedure or Analysis Variation:

LDW-SC30, LDW-SC44, LDW-SC51 and LDW-SC56: The recovered length for each core was less than 6 ft and did not allow for each core to be sub-sectioned into 0.5ft sampling intervals.

Variation from Field or Analytical Procedure:

LDW-SC30, LDW-SC44, LDW-SC51 and LDW-SC56: Each core was not sectioned into 0.5ft sampling intervals at 5.5 to 6 ft, but were instead sectioned as follows:

LDW-SC30-5.5-5.9

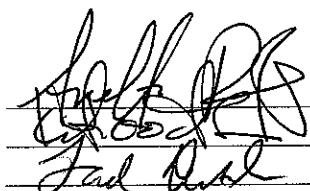
LDW-SC44-5.5-5.8

LDW-SC51-5.5-5.8

LDW-SC56-5.5-5.6

Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:

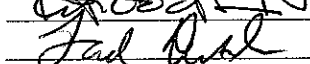


Date: 3.21.06

Project Officer:

Date: 3/22/06

QA Officer:



Date: 3-22-06

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32
Material to be Sampled: LDW-SC55
Measurement Parameter: Chemical analyses and archive sample

Standard Procedure for Field Collection & Laboratory Analysis:

Method A involves sectioning the core into a maximum of six intervals (i.e., 0-1, 1-2, 2-4, 4-6, 6-8, and 8-10 ft, depending on the length of the core recovered) and submitting the samples for the first three intervals (0-1, 1-2, and 2-4 ft) for initial chemical analyses. Samples collected from the lower three depth intervals (4-6, 6-8, and 8-10 ft) will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).




Reason for Change in Field Procedure or Analysis Variation:

The field geologist observed a major difference in stratigraphic units at 3 ft, so the 2-3 ft interval was submitted for chemical analyses and the 3-4 ft interval was archived, with approval from EPA.

Variation from Field or Analytical Procedure:

LDW-SC55: The 2-4 ft interval was sectioned into two 1-ft sampling intervals. The 2-3 ft sampling interval was submitted for chemical analyses rather than the entire 2-4 ft interval. The 3-4 ft interval was archived.

Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:		Date:	<u>3.21.06</u>
Project Officer:		Date:	<u>3/22/06</u>
QA Officer:		Date:	<u>3.22.06</u>

PROTOCOL MODIFICATION FORM

Project Name and Number: 05-08-06-32

Material to be Sampled: LDW-SC33

Measurement Parameter: Archive sample

Standard Procedure for Field Collection & Laboratory Analysis:

Method B involves sectioning the core into five intervals (i.e., 0-2, 2-4, 4-6, 6-8, and 8-10 ft, depending on the length of the core recovered) and submitting the samples for the first two intervals (0-2 and 2-4 ft) for initial chemical analyses. Samples collected from the lower three depth intervals (4-6, 6-8, and 8-10 ft) will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).

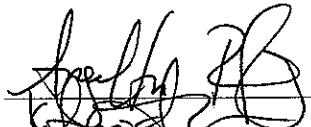
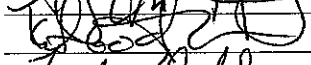
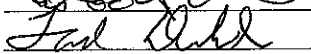
Reason for Change in Field Procedure or Analysis Variation:

The sample archived from 8 to 10 ft contained about six inches of silt from 8 to 8.5 ft. An additional archive sample was collected from a depth interval that did not contain silt (9.5 to 10 ft) for potential future analyses.

Variation from Field or Analytical Procedure:

LDW-SC33: An additional archive sample was collected at the 9.5-10 ft interval.

Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:	<u></u>	Date:	<u>3.21.06</u>
Project Officer:	<u></u>	Date:	<u>3/22/06</u>
QA Officer:	<u></u>	Date:	<u>3.22.06</u>

PROTOCOL MODIFICATION FORM

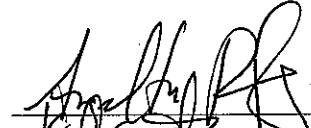


Project Name and Number: 05- 08-06-32
Material to be Sampled: LDW-SC53
Measurement Parameter: Chemical analyses

Standard Procedure for Field Collection & Laboratory Analysis:
Method B, sediment from 0.5ft intervals in each core will be archived (Section 3.1.3 of the subsurface sediment sampling QAPP).

Reason for Change in Field Procedure or Analysis Variation: _____
Inadvertent change in procedure.

Variation from Field or Analytical Procedure: _____
LDW-SC53: The 1-1.5 ft and 1.5 -2 ft archive sampling intervals were inadvertently sampled as one 1-2 ft interval. ~~Two samples were collected from this one interval, placed in two 16 oz. jars, and labeled as LDW-SC53-1-2A and LDW-SC53-1-2B.~~ **AK 3.22.06**

Special Equipment, Materials or Personnel Required: N/A

Initiator's Name:		Date:	<u>3.21.06</u>
Project Officer:		Date:	<u>3/22/06</u>
QA Officer:		Date:	<u>3.22.06</u>

PROTOCOL MODIFICATION FORM

Project Name and Number: LDW Subsurface Sediment Sampling 05-08-06-32
Material to be Sampled: Sediment cores
Measurement Parameter: not applicable

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

Cores that are not processed within four hours will be chilled with ice (QAPP Section 3.2.4; Windward 2006).

Reason for Change in Field Procedure or Analysis Variation: Low temperatures during the sampling event ranged from 23-44° F (mean 34.6° F). Only cores collected in the late afternoons were stored overnight in a locked box-truck and processed the following mornings.

Variation from Field or Analytical Procedure: Cores were not chilled with ice prior to being processed.

Special Equipment, Materials or Personnel Required: none

Initiator's Name: T.D.D. Date: 02.27.06
Project Officer: [Signature] Date: 3/8/06
QA Officer: [Signature] Date: 3.8.06

PROTOCOL MODIFICATION FORM

Project Name and Number: LDW Subsurface Sediment Sampling 05-08-06-32
Material to be Sampled: Sediment cores
Measurement Parameter: Penetration depth and percent recovery

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

Collect sediment cores to a 10-ft (3m) depth below mudline (or until refusal) and estimated recovery is greater than 75 percent (QAPP Section 3.2.3; Windward 2006).

Reason for Change in Field Procedure or Analysis Variation: MudMdc hit refusal early (before both penetration depth and percent recovery could meet QAPP-specified core acceptance criteria) after multiple attempts at many stations.

Variation from Field or Analytical Procedure: Sample acceptance criteria modified to collect sediment cores to a penetration depth of >10ft and >60% recovery, or >7ft penetration depth and >75% recovery upon consultation with EPA.

Special Equipment, Materials or Personnel Required: none

Initiator's Name: T. Do Date: 02.27.06
Project Officer: [Signature] Date: _____
QA Officer: [Signature] Date: 3.8.06

PROTOCOL MODIFICATION FORM

Project Name and Number: LDW Subsurface Sediment Sampling 05.08.06.32

Material to be Sampled: Sediment cores

Measurement Parameter: Sampling locations

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

Collect sediment cores at locations within 10m of the proposed (target) locations (QAPP section 3.2.3; Windward 2006).

Reason for Change in Field Procedure or Analysis Variation: Location LDW-SC19 was blocked by a pier; three attempts hit hard substrate/rip rap after approximately 6 ft. of penetration; a fourth attempt (>10m off-target) at the same bathymetry had the same obstacles. Location LDW-SC26 was blocked by a barge. Location LDW-SC28 was blocked by a dry-dock; one core had low penetration/recovery, two cores hit hard substrate, and one (>10m off-target) contained a gravel cap layer.

Variation from Field or Analytical Procedure: Location LDW-SC19 was sampled 54.2 ft. NW off-target; location LDW-SC26 was sampled 57.6 ft. E off-target; location LDW-SC28 was sampled 52.9 ft. NE off-target.

Special Equipment, Materials or Personnel Required: none

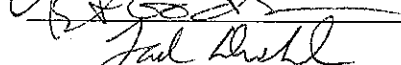
Initiator's Name:



T. Do

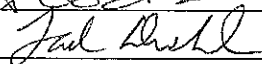
Date: 02.27.06

Project Officer:



Date: 3/8/06

QA Officer:



Date: 3.8.06

PROTOCOL MODIFICATION FORM

Project Name and Number: LDW Subsurface Sediment Sampling 05-08-06-32
Material to be Sampled: Sediment Cores
Measurement Parameter: not applicable

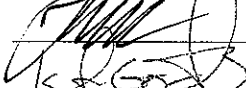
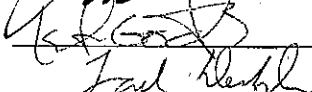

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

Cores will be collected by using a diver-assisted impact core sampler called the MudMole (QAPP section 3.2.3; Windward 2006).

Reason for Change in Field Procedure or Analysis Variation: The MudMole could not penetrate the harder substrate at some locations enough to meet QAPP core acceptance criteria. Also, some stations were not accessible for sampling because they were blocked by vessels or barges while the MudMole was employed.

Variation from Field or Analytical Procedure: A Vibracore was used to sample sediment cores from locations LDW-SC19 and LDW-SC46, and to resample from locations LDW-SC17, LDW-SC28, LDW-SC40, LDW-SC47, LDW-SC50 and LDW-SC54.

Special Equipment, Materials or Personnel Required: Marine Sampling Services was contracted to collect sediment cores using a Vibracorer, a vibratory core sampler.

Initiator's Name:  T. To Date: 02.27.06
Project Officer:  Date: 3/8/06
QA Officer:  Date: 3.8.06

PROTOCOL MODIFICATION FORM

Project Name and Number: LDW Subsurface Sediment Sampling 05-08-06-32
Material to be Sampled: Sediment cores
Measurement Parameter: not applicable

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):


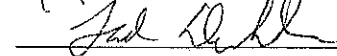
If sample acceptance criteria are not achieved in the first core, the sample will be set aside and up to two additional core drives will be advanced at locations within 10m of the proposed location (BAPP Section 3.2.3; Windward 2006).

Reason for Change in Field Procedure or Analysis Variation: Low penetration and recovery using the MudMole for two core drives. A third core drive, using the Vibracorer, was supposed to be attempted, but could not be done because there was not enough vertical clearance for the R/V Nancy Ann to access the proposed location at LDW-SC29.

Variation from Field or Analytical Procedure: The second core, collected from the MudMole, was processed and submitted for analyses because it had the higher recovery. (LDW-SC29)

Special Equipment, Materials or Personnel Required: not applicable

Initiator's Name:


T. Do

Jed [unclear]

T. Do

Date: 02-27-06

Project Officer:

Date: 3/8/06

QA Officer:

Date: 3.8.06

PROTOCOL MODIFICATION FORM

Project Name and Number: LDW Subsurface Sediment Sampling 05-08-06-32

Material to be Sampled: Sediment cores

Measurement Parameter: Penetration depth and percent recovery

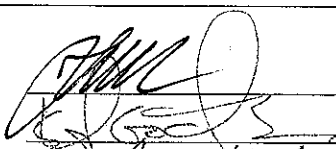
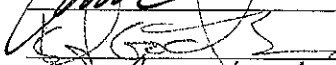
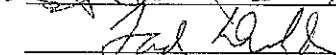
Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

If sample acceptance criteria are not achieved in the first core, the sample will be set aside and up to two additional core drives will be advanced at locations within 10m of the proposed location.

Reason for Change in Field Procedure or Analysis Variation: Cores collected at locations LDW-SC1 (R2); LDW-SC11 (R1); LDW-SC30 (R2); LDW-SC38 (R1); LDW-SC44 (R2); LDW-SC48 (R2); LDW-SC51 (R1); LDW-SC52 (R3) were accepted for core processing and chemical analyses upon consultation with agencies (EPA and Ecology).

Variation from Field or Analytical Procedure: (Amended) sample acceptance criteria were not met for core(s) collected at locations LDW-SC1 (2 cores); LDW-SC11 (1 core); LDW-SC30 (2 cores); LDW-SC38 (2 cores); LDW-SC44 (3 cores); LDW-SC48 (2 cores); LDW-SC51 (2 cores); LDW-SC52 (3 cores).

Special Equipment, Materials or Personnel Required: none

Initiator's Name:		T. Do	Date:	02.27.06
Project Officer:			Date:	3/8/06
QA Officer:			Date:	3.8.06