

Mississippi Canyon 252 Incident
NRDA Sampling Plan

Quantifying the Distribution, Abundance and Biodiversity of Benthic
Megafauna and Mesopelagic/Bathypelagic Megaplankton in the Vicinity of
the MC252 Spill Plan Addendum

Deepwater Benthic Communities Technical Working Group/Water Column
Technical Working Group

Final Draft: August 15, 2011

Approval of this work plan is for the purposes of obtaining data for the Natural Resource
Damage Assessment. Each Party reserves its right to produce its own independent interpretation
and analysis of any data collected pursuant to this work plan.

APPROVED:

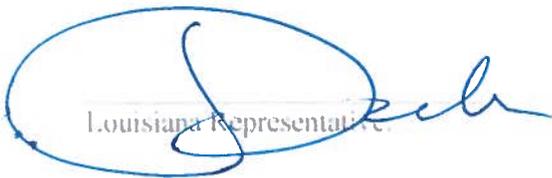


Department of Commerce Trustee Representative:

Sept 25, 2011

Date

RP



Louisiana Representative:

9/28/2011

Date



BP Representative:

Sept. 16, 2011

Date

Mississippi Canyon 252 Incident NRDA Sampling Plan

Quantifying the Distribution, Abundance and Biodiversity of Benthic Megafauna and Mesopelagic/Bathypelagic Megaplankton in the Vicinity of the MC252 Spill Plan Addendum

Draft: August 15, 2011

Proposed Cruise Dates: August 10 – 24, 2011

Prepared by: Mark Benfield (LSU), Darcy Metzler, Carly Spahr (Cardno ENTRIX)

Reviewed by: Wayne Kicklighter, Laura Riege (Cardno ENTRIX)

Reviewed by: Trustees: Deborah French McCay (ASA), John Quinlan (NOAA), Christopher Lewis (IEc), Amanda Vincent (LA)

1.0 BACKGROUND AND OBJECTIVES

1.1 Background

From June 8 through June 22, 2011, BP (with Dr. Benfield as Chief Scientist) and the Trustees implemented the cooperative Natural Resource Damage Assessment (NRDA) sampling plan titled *ROV Benthic Megafauna and Mesopelagic/Bathypelagic Megaplankton Work Plan* (June, 2011), hereinafter referred to as the Plan.

The Plan targeted ten sites (Table 1) with the potential addition of an eleventh site should time permit. These included sites in close proximity (<4 km) of the Macondo Blowout Preventer (BOP) as well as more distant sites. Sites #1-6 were established in August 2010 by BP-sponsored cruises lead by Dr Benfield. Four of these sites (#1-4) were previously surveyed by the Olympic Challenger during August 2010. Two of these four (the sites 2000 meters North and 2000 meters West of the Macondo BOP) were again surveyed by the Development Driller III (DD3) Remotely Operated Vehicle (ROV) in March 2011. One site (MC-252 Well #2) was surveyed by the ROVs on the Development Driller II (DD2) at approximately weekly intervals from August to November 2010 and again by the DD3 ROV in March 2011. The final site (approximately 3.3 kilometers north of the BOP) was located in MC208 that had been sampled with a megacorer during the Response and where the BP “Abandonment Autonomous Underwater Vehicle (AUV) Survey” was performed in April 2011. With the exception of the MC208 site, these sites (Table 1, Figure 1) were located within a 2000 meter radius of the BOP. In addition, four other more distant sites (with one more should time permit) were proposed. These sites were chosen after consideration of historic sampling and other data collected during the NRDA studies. Selected sites (1-11) are shown in Figure 1 and all are listed in Table 1.

The Plan was based on the assumption that water column surveys would initially take 1 hour per depth because the pilots would have to become familiar with the demands of flying these surveys. Experience working with industrial ROV pilots indicated that it takes several hours of practice to become proficient with these surveys. Therefore, the time estimate for the completion of the first set of water column surveys was 10 hours with fewer hours required to complete each of the additional surveys.

Due to a variety of factors, including equipment issues, weather delays, and time constraints, a total of five of the eleven study sites were sampled. This addendum proposes to visit and sample the remaining six study sites (study sites 4, 7, 8, 9, 10, and 11), as well as re-visit additional study sites as time permits¹. For purposes of identification and clarity, the cruise proposed under this addendum is referred to as “Leg 2” or the “second leg.”

Except as amended herein, all provisions of the Plan remain in effect.

1.2 Objectives

The main objective of this addendum is to initiate Leg 2 of the Plan. Leg 2 will complete the survey based on the Plan’s original survey rationale and criteria. By and large, the original target sampling grid, approach, and methodologies remains unchanged (Table 1, Figure 1).

2.0 STUDY PLAN

The tentative cruise dates for this benthic megafauna and mesopelagic / bathypelagic megaplankton survey are August 9 – 22, 2011.

The sampling design and approach outlined in the Plan (Appendix A) will be maintained during the Leg 2 of this survey. For a full description of the approach and survey methodology, see section 2.2 and Attachment A of the Plan (Appendix A). The approach performed during cruise 2 will include water column and seafloor and surveys. As outlined in the Plan:

- Water column survey methods will deploy the ROV in the Tethered Management System (TMS) and lower the TMS to an appropriate altitude above the target depth (150 meters if working from the surface);
- ROV seafloor survey design will consist of 24 x 250 meters long transects flown outwards from the station coordinates at headings separated by 15° flying just above the seafloor;
- Video will be recorded continuously along each transect; and
- High-quality, representative still images of every organism that is encountered will be taken.

2.1 Study Sites

The study sites established by the Plan remain unchanged except in the case of site 11 (originally proposed as Red Crab station 6E). Table 1, Figure 1 outline and illustrate the locations of the

¹ The five sites sampled in the first cruise were all sites BP identified. Five of the eight sites to be sampled in the addendum cruise are sites identified by the Trustees

(revised) study sites. Table 2 summarizes the rationale for why certain study sites have been selected to be re-visited. Table 2 also outlines the priority in which the study sites will be visited during the cruise 2 as described in this addendum. If time permits, all study sites outlined in Table 2 will be sampled, however the cruise will not be extended if all study sites listed in Table 2 are not completed within the fourteen days allotted for this cruise. It is reasonable to complete 6 to 8 sites in the allotted timeframe barring subsea weather and mechanical failures.

Table 1 Study site locations from cruise 1

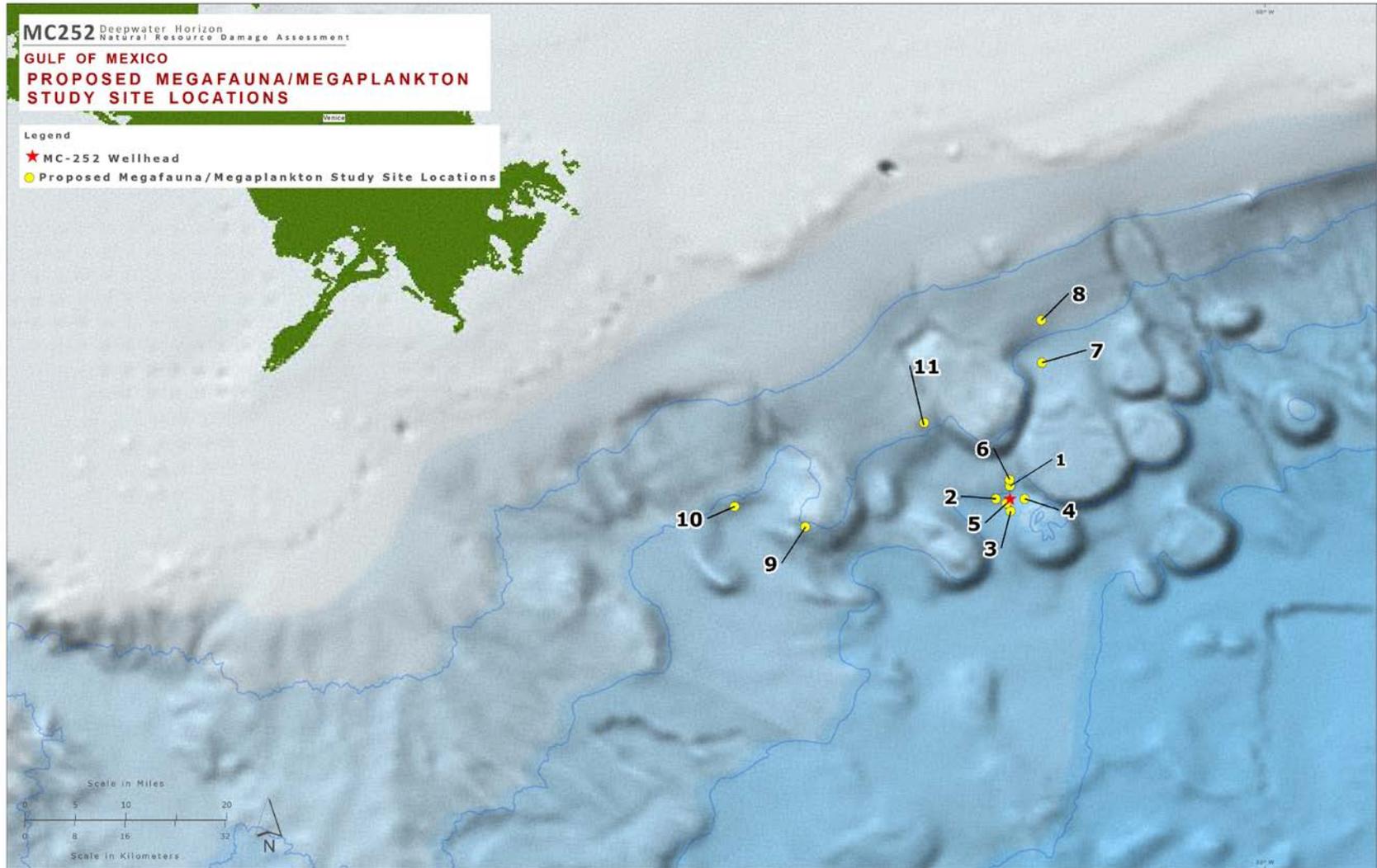
| Site | Description | Latitude | Longitude | Depth (m) |
|------|--|--------------|------------|-----------|
| 1 | 2000 m North of BOP | ██████████ | ██████████ | 1473 |
| 2 | 2000 m West of BOP/ MC252 Photomosaic | ██████████ | ██████████ | 1521 |
| 3 | 2000 m South of BOP | ██████████ | ██████████ | 1612 |
| 4 | 2000 m East of BOP | ██████████ | ██████████ | 1577 |
| 5 | MC252 Well #2 | ██████████ | ██████████ | 1578 |
| 6 | MC208 Photomosaic | ██████████ | ██████████ | 1450 |
| 7 | <i>Red crab</i> 1D | ██████████ | ██████████ | 1043 |
| 8 | <i>Red crab</i> 1C | ██████████ | ██████████ | 860 |
| 9 | WSW Megafauna1 | ██████████ | ██████████ | 1043 |
| 10 | WSW Megafauna2 | ██████████ | ██████████ | 1044 |
| 11 | MC118 | ██████████ N | ██████████ | ~900 |

Table 2 Study sites with rationale and priority for cruise 2

| Site | Rationale | Priority |
|------|--|----------|
| 2 | Repeat survey close in time to cruise 1 to compare variability from survey methodology and repeat water column surveys using the modified 'light sheet' approach | 8 |
| 4 | Not surveyed during cruise 1 | 7 |
| 6 | Seafloor survey not completed during cruise 1 | 6 |
| 7* | Not surveyed during cruise 1 | 1 |
| 8* | Not surveyed during cruise 1 | 2 |
| 9 | Not surveyed during cruise 1 | 4 |
| 10 | Not surveyed during cruise 1 | 5 |
| 11* | Not surveyed during cruise 1 | 3 |

* These stations are scheduled to be sampled by the *Pisces* during the *Red Crab* study and sampling efforts should be coordinated so that ROV video collection occurs before the *Pisces* set traps at these locations if at all possible. Study site description and location listed in table 1.

Figure 1 Locations of the proposed survey sites (⊙) for the Megafaunal cruise 1 and 2. See Table 1 for coordinates



2.2 Field Methods and Equipment, Record Keeping, and Reporting

All remaining aspects of Leg 2 of this Plan will be conducted as described in the original Plan. These aspects include:

- Navigation and survey equipment and field procedures;
- Logs and records keeping;
- Digital and shipboard data chain-of-custody;
- Post cruise analysis and reporting;
- Health and safety procedures and ship-to-shore communications.

3.0 SCHEDULE AND BUDGET

3.1 SCHEDULE

The Leg 2 of the Plan is currently proposed for 14 days in August 2011. Because the sampling effort is now divided into two Cruise legs, a single survey report that includes the metadata describing the sampling efforts conducted during both survey legs will be completed within four weeks of the completion of Leg 2 by the Chief Scientist. This descriptive report will be followed by a more comprehensive analysis of the data, pending approval of a cooperative analysis Plan.

3.2 BUDGET

The costs summarized below are associated with the collection of the ROV data during this project. National Oceanic and Atmospheric Administration's (NOAA) costs are in Budget Chart #1. Costs for vessel charter and ROV time as well as Louisiana State University (LSU) labor and equipment costs are included in Budget Chart #2. The project will require approximately 14 days of ship/ROV time for the survey as provided in Budget Chart #2.

The field survey costs, miscellaneous costs, and travel costs indicated in Budget Chart # 1 below shall be reimbursed by BP America upon receipt of written invoices submitted by the Trustees. The Vessel Costs and LSU labor and equipment costs indicated in Budget Chart # 2 shall be paid directly by BP America.

Costs are based on use of the *M/V HOS Sweetwater* pending availability through the Vessel Coordination Committee. Costs are representative of vessels in the NRDA Fleet. Mobilization and demobilization of the *M/V HOS Sweetwater* (or similar vessel) will be conducted by Continental Shelf Associates, Inc. (CSA), at the Bordelon Yard in Houma, Louisiana. Vessel costs are inclusive of CSA personnel. Cardno ENTRIX will provide scientists and data managers for surveys (Cardno ENTRIX costs provided separately). Costs of CSA mobilization, participation in the surveys and reporting are included below.

The Parties acknowledge that this budget is an estimate, and that actual costs may prove to be higher. BP's commitment to fund the costs of this work includes any additional reasonable costs

within the approved scope of this work plan that may arise. The Trustees will make a good faith effort to notify BP in advance of any such increased costs.

Budget Chart #1 Trustee Labor

| Field Survey Costs | Hrs/Days/Trips | Day/Hr Rate | Total |
|-----------------------------|----------------|-----------------|------------------|
| NOAA Labor (days): | | | |
| 2 NOAA scientists | 15 x 2 | \$1,500 | \$45,000 |
| 2 NOAA Data Managers | 15 x 2 | \$1,500 | \$45,000 |
| Travel | 4 | \$10,000 | \$10,000 |
| TOTAL | | | \$100,000 |

Days/Trips based on 15 potential cruising days. Labor is estimated cost and hours.

Budget Chart #2

| Cruise Cost Table | Total |
|--|--------------------|
| LSU Personnel, supplies and equipment | \$261,959 |
| Mobilization Costs | \$283,500 |
| Vessel Costs | \$3,626,478 |
| Fleet Mgmt / Shore Support | \$420,000 |
| Total Estimated Cruise Cost | \$4,591,937 |

Total Costs: \$4,691,937