Mississippi Canyon 252

ADDENDUM TO PREASSESSMENT PLAN TO DETERMINE POTENTIAL EXPOSURE AND INJURIES OF NESTING AND HATCHLING KEMP'S RIDLEY TURTLES AND THEIR NESTS

Approval of this Kemp's Ridley Sea Turtle Plan Addendum 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.

This plan will be implemented consistent with existing trustee regulations and policies. All applicable state and federal permits must be obtained prior to conducting work.
The trustees have developed a preliminary conceptual model of the DWH release, potential pathways and routes of exposure, and potential receptors. This preliminary model has informed the trustees' decision to pursue the studies outlined in the work plan. By signing this work plan addendum and agreeing to fund the work outlined, BP is not endorsing the model articulated in the addendum.

Kevin D. Plumlee for Greg Mason — 10/13/2011
Department of Interior Trustee Representative: — Date

FOR ROLAND GUIDRY — 11/02/2011
Louisiana Trustee Representative: — Date

10/14/2011
Texas Trustee Representative: — Date

10/18/2011
BP Representative: — Date

Mississippi Canyon 252

ADDENDUM TO PREASSESSMENT PLAN TO DETERMINE POTENTIAL EXPOSURE AND INJURIES OF NESTING AND HATCHLING KEMP'S RIDLEY SEA TURTLES AND THEIR NESTS

Introduction

Potential impacts of the *Deepwater Horizon*/Mississippi Canyon 252 (MC 252) oil and dispersants on Gulf coast Kemp's ridley sea turtles may range from mortality to sub-lethal stress and chronic impairment, including potential deleterious effects on reproduction and recruitment.

A Technical Working Group (TWG), composed of technical experts and trustee agency representatives has been assembled to draft a work plan to carry out post-discharge assessment of Kemp's ridley sea turtles along the Texas coastline of the Gulf of Mexico in support of the ongoing Natural Resource Damage Assessment (NRDA) for the MC 252 oil spill. Additionally, BP Exploration and Production, Inc. (BP) has participated in a review capacity. BP or its representative was to be provided an opportunity to observe all sampling events occurring after the plan was signed, subject to logistical feasibility and permit requirements. The field work described in this plan is complete at the time of signature.

This Addendum to the Pre-Assessment Plan to Determine Potential Exposure and Injuries of Nesting and Hatchling Kemp's Ridley Sea Turtles and Their Nests (Plan or Addendum) is a component of the NRDA for the MC 252 Oil Spill. All studies called for by this Addendum are to be completed as an adjunct to the ongoing efforts conducted on behalf of the Division of Sea Turtle Science and Recovery at the Padre Island National Seashore (PAIS). In 1986, Padre Island National Seashore began systematic efforts to detect, investigate, and protect nesting by Kemp's ridley and other sea turtles on North Padre Island, and these efforts have grown over the years. Nest detection patrols occur on the entire Texas Gulf of Mexico beachfront to some extent during the Kemp's ridley nesting season. Collection of Kemp's ridley nests occurs primarily between April and July. Nests that are found on the Texas coast are retrieved for protected incubation. Most nests from North Padre Island (including PAIS) northward are transported to the incubation facility at PAIS for protected care. Some nests from the southern end of PAIS are moved to a corral located at a base camp there. All nests from South Padre Island and Boca Chica Beach are moved to a corral on South Padre Island. The data collected in this new NRDA effort are complementary to those collected in the 2010 Kemp's ridley nesting season and similar to those collected in the Loggerhead nesting NRDA Preassessment plan, studies approved through the TWG review process and signed by BP and Trustees in 2010. The work described in this Addendum is a subset of the overall Kemp's ridley monitoring program and includes collection of data that supplement the typical assessment completed annually.

Purpose:

The purpose of this Plan is to document potential exposure to MC 252 oil and dispersants (hereafter referred to as "MC 252 oil") and possible associated impacts to the adult, hatchling and egg life stages of Kemp's ridley sea turtle, a species that resides in the Gulf of Mexico and nests along the Texas shoreline. The Plan provides for data collection to document post-discharge conditions consistent with the standard operating protocols (SOPs) referred to in this document. This Addendum is the second year of a study to assess the potential impacts of the MC 252 Oil Spill on nesting and hatchling Kemp's ridley sea turtles and Kemp's ridley sea turtle nests. Data generated pursuant to this Addendum are anticipated to assist in characterizing potential exposure and possible resulting impacts that may have occurred in this species while nesting females foraged in the area of the release.

Objectives

1. Assess nesting female physical condition, conduct satellite tracking inter-nesting and post-nesting movements, and collect blood samples as part of the annual Kemp's ridley management program.

2. Collect samples to assess possible toxicological and physiological effects and impairments in nesting females, eggs, and hatchlings at Padre Island National Seashore and Upper Texas coastal beaches in the Gulf of Mexico.

The intent is to achieve these objectives by conducting nesting female physical evaluations; satellite tracking of nesting female inter-nesting and post-nesting movements; collecting blood samples; collecting residual tissue samples from eggshells, non-viable eggs, and hatchlings. Nesting materials (sand) will be collected at natural nesting sites to identify potential impacts from MC 252 oil.

The sample analyses to be conducted will be described in a separate addendum. The Trustees provided a draft of the cooperative analytical addendum to BP on July 11, 2011. BP and the Trustees agree to work together in good faith to cooperatively develop this addendum, and agree that the addendum will include analyses for Polycyclic Aromatic Hydrocarbons (PAHs) and fingerprinting for MC252 oil, where technically practicable. However, if BP and the Trustees are unable to reach consensus on any individual element(s) of the analytical addendum, the Trustees reserve the right to proceed independently on those elements on which no agreement was reached. Regardless, for PAH analyses and MC252 oil fingerprinting of samples collected as part of this Addendum or the 2010 Preassessment Plan and requested by BP, the laboratory data sharing language below will apply. With the expectation that the total number of samples will not exceed 55, the Trustees agree to prioritize the analysis of carapace swipes and sand samples that are likely to have oil. BP agrees to fund the costs of laboratory results for PAH analyses and fingerprinting for MC 252 oil requested and received by BP outside of a cooperative analytical plan.

Background:

The general background material for this Addendum has not changed from the previously approved 2010 work plan.

General Study Approach

The study approach for this Addendum is the same as that used in the previously approved 2010 work plan, including the following:

1. Carapace swipes will be performed on nesting adult turtles with visible oil and those receiving satellite transmitters, while any visible surface oil will be collected,
2. Blood samples will be taken from nesting adult female Kemp's ridley turtles,
3. Up to 20 adult nesting Kemp's ridley turtles will receive satellite transmitters,
4. Broken or cracked eggs that are not incubated will be collected,
5. Sand samples will be collected from the nest cavity of each sea turtle chosen to carry a satellite transmitter.
6. Satellite tracking data will be used to assess inter-nesting and post-nesting movements.

Details of each of these modifications can be found in the Sampling Design section, below.

Study Area:

Activities covered in this Addendum will incorporate the same two study areas described in the previously approved 2010 work plan (Figure 1).

Sampling Design:

Nesting Female Assessments:

Texas coastal surveys for nesting Kemp's ridley turtles and standard identification (non-transmitter) tagging will be performed in the same manner as described in the previously approved 2010 work plan. For NRDA-associated nesting sites in the two study areas, including those where no turtle was encountered, GPS data will be collected. If an animal was previously tagged by study investigators or other investigative groups, then the previously established animal identification numbers will be maintained.

Turtles from the two field study sites will be examined as field conditions and resources permit, and any evidence of illness or tumors will be described in detail in field notes and photographed. Any turtle found with visible oil and all turtles receiving satellite transmitters will undergo a carapace swab. A 10 cm square section of the highest point of the carapace will be swabbed with a methanol soaked Teflon® pad which will be immediately placed in a pre-certified chemically-clean glass container. Any visible oil will be collected in the same manner from all nesting turtles from both study sites. A 6 mm biopsy punch will be used to obtain two tissue samples as described in the previously approved 2010 work plan.

For nesting turtles from each of the two sites, field personnel will attempt to collect 10 milliliters of blood from the cervical sinus using Vacutainer® needles and tubes (Becton, Dickinson and Company, Franklin Lakes, New Jersey). Blood samples will be partitioned for clinical chemistry, hematology and chemical analyses to be described in a separate analysis plan or addendum.

A 6 mm biopsy punch will be used to obtain scute samples (per approved FWS protocol) in the same manner as described in the previously approved 2010 work plan.

Nesting emergence and success

After nesting is complete, all nests will be excavated and any intact cracked eggs will be collected in chemically clean amber glass sample jars, transported on ice to the laboratory, and stored frozen. The balance of the excavated eggs will be moved to either a protected corral or the sea turtle incubation facility at the Padre Island National Seashore for the duration of the incubation period.

Following hatching and emergence, all remaining nest contents (unhatched eggs, hatched eggs, pipped eggs) and live and dead hatchlings and embryos will be processed in the same manner as described in the previously approved 2010 work plan.

Sand surveys

In 2011, sand samples will be collected from the nest cavity for 10 nests of telemetered females from each of the two study sites for a total of 20 samples. Based on past experience, nests on the Upper Texas Coast are not predicted to exceed 10 – 15 nests total. In the event that fewer than 10 females are telemetered on the Upper Texas Coast, nest sand samples will be collected from all observed nests and archived. If additional nest sand samples are needed to reach a total of 10, they will be randomly selected from among the archived samples. Sands from individual nests will be placed in a chemically clean, sterile glass jar for temporary storage on ice until frozen at the laboratory for further shipment as directed.

Sea Turtle Tracking and the Number and Extent of Nesting Females Potentially Exposed

Depending on the number of turtles observed, up to five turtles located within each of the two study sites will be fitted with SIRTRACK Kiwi Sat 101 satellite tags and up to five with Wildlife Computer Mk10 Fastlock GS satellite tags (for a total of up to 20 satellite transmitters deployed), using established methods for sea turtle satellite telemetry (Seney and Landry 2008, Shaver and Rubio 2008) and in the same manner as described in the previously approved 2010 work plan. The Fastlock tags will be programmed to provide dive data, as well as to obtain GPS locations once per week. BP and/or its representative will be allowed to observe any field work at the two study sites described in this plan. The Trustees and BP agree to undertake in good faith all efforts necessary to provide BP or its representative an opportunity to observe field work.

Sample and Data Handling:

MC 252 NRDA chain-of-custody procedures will be observed at all times for all samples. All samples will be transferred with appropriate chain of custody forms and all samples that will undergo chemical analysis will be shipped to the appropriate laboratories for processing and analysis. Camera memory cards (to include GPS locations) will be handled under Chain-of-Custody after a card is full or after the study is completed pursuant to a protocol for transferring and uploading digital photos.

All field and laboratory data will be collected, managed and stored in accordance with written SOPs. The appropriate training on particular equipment or in the conduct of specific field studies for all personnel involved with the project shall be documented and those records kept on file for the duration of this project.

All materials associated with the collection or analysis of samples under these protocols or pursuant to any approved work plan, except those consumed as a consequence of the applicable sampling or analytical process, must be retained unless and until approval is given for their disposal in accordance with the retention requirements set forth in paragraph 14 of Pretrial Order # 1 (issued August 10, 2010) and any other applicable Court Orders governing tangible items that are or may be issued in MDL No. 2179 IN RE: Oil Spill by the Oil Rig "DEEPWATER HORIZON" (E.D. LA 2010). Such approval to dispose must be given in writing and by a person authorized to direct such action on behalf of the state or federal agency whose employees or contractors are in possession or control of such materials.

Data Sharing

Copies of all data collected in accordance with this plan, including raw data, field sheets, and field notes, will be provided to BP and its representatives and the Louisiana Oil Spill Coordinator's Office (LOSCO) within a reasonable timeframe once data collection, QA analyses and data entry procedures are complete, and no later than 45 days after the non-analytical data are collected. *Non*-analytical data includes field sheets, photos, photologger forms and GPS files. For non-analytical data collected before the Addendum is signed, such data shall be shared not later than 45 days after the Addendum is signed. All non-analytical data generated from this Addendum, if signed by November 1, 2011, will be provided to BP by November 30, 2011, with the exception of the telemetry data. Telemetry data will be made publicly available on www.seaturtle.org after a 7 day delay for QA/QC review and will be provided until such time as the telemetry devices cease to operate. Raw telemetry data will be provided to BP upon request.

All samples collected pursuant to this plan will be submitted to laboratories that are operated in a manner that is consistent with the guidelines of the Analytical Quality Assurance Plan for the Mississippi Canyon (Deepwater Horizon) Natural Resource Damage Assessment (version 2.2 or later). (See Appendices A and B for data collected pursuant to this plan which will be provided to BP/Cardno/ENTRIX and LOSCO).

Assuming the parties execute a cooperative analytical addendum for laboratory testing, laboratory results will be provided consistent with the laboratory data sharing language in the following paragraph:

Each laboratory shall simultaneously deliver raw data, including all necessary metadata, generated as part of this Addendum as a Laboratory Analytical Data Package (LADP) to the trustee Data Management Team (DMT), the Louisiana Oil Spill Coordinator's Office (LOSCO)
on behalf of the State of Louisiana, and to BP (or Cardno/ENTRIX on behalf of BP). The electronic data deliverable (EDD) spreadsheet with pre-validated analytical results, which is a component of the complete LADP, will also be delivered to the secure FTP drop box maintained by the trustees' Data Management Team (DMT). Any preliminary data distributed to the DMT shall also be distributed to LOSCO and to BP (or Cardno/ENTRIX on behalf of BP). Thereafter, the DMT will validate and perform quality assurance/quality control (QA/QC) procedures on the LADP consistent with the authorized Analytical Quality Assurance Plan, after which time the validated/QA/QC'd data shall be made available simultaneously to all trustees and BP (or
Cardno/ENTRIX on behalf of BP). Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Analytical Quality Assurance Plan and the issue and results
shall be distributed to all parties. In the interest of maintaining one consistent data set for use by
all parties, only the validated/QA/QC'd data set released by the DMT shall be considered the
consensus data set. In order to assure reliability of the consensus data and full review by the
parties, no party shall publish consensus data until 7 days after such data has been made
available to the parties. Also, the LADP shall not be released by the DMT, LOSCO, BP or
Cardno/ENTRIX prior to validation/QA/QC, absent a showing of critical operational need. Should any party show a critical operational need for data prior to validation/QA/QC, any released data will be clearly marked "preliminary/unvalidated" and will be made available equally to all trustees and to BP (or Cardno/ENTRIX on behalf of BP).

Laboratory data sharing provisions in this Addendum pertain to and are contingent upon a cooperative analytical addendum being developed as discussed under Objective 2, above. The laboratory data sharing provisions do not apply to laboratory data generated independently, except for PAH and fingerprinting MC252 oil as previously referred to in this Addendum.

Within 30 days of the execution of this Addendum, the Trustees shall provide BP and co-Trustees with an inventory of the 2010 samples. The Trustees will provide updates to the inventory to BP no less than every 45 days thereafter to reflect the collection of samples under

this 2011 Addendum. The inventory will indicate whether a sample has undergone laboratory testing for PAHs or fingerprinting for MC252 oil.

Budget:

As detailed in the budget below, the total field cost for this 2011 Addendum is $403,750. 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 scope of this approved work plan that may arise. The trustees will make a good faith effort to notify BP in advance of any such increased costs.

In addition, BP agrees to fund the cost of laboratory results for PAH analyses and fingerprinting for MC252 oil requested and received by BP outside of a cooperative analytical plan.

Durable Goods: All durable equipment (such as cameras, GPS, etc.) purchased by BP for this study will be returned to BP or their designated representatives at the conclusion of its use for this study unless otherwise agreed. Radio tags that are recovered or are not deployed will be returned to BP or its designated contractor at the end of this study, unless otherwise agreed.

Some equipment needed for this study may be in BP's existing inventory. BP-owned equipment will be used if available and when appropriate to the needs of the proposed work.

Principle Investigator:
Donna Shaver (361-949-8173, ext. 226, Donna_Shaver@nps.gov), National Park Service

Other investigators:
Kim Reich ([redacted]), Andre Landry ([redacted]), Texas A&M University at Galveston

Michael Hooper (573-441-2985, mhooper@usgs.com), U.S. Geological Survey, Columbia Environmental Research Center

Celine Godard-Codding, [redacted], Texas Tech University

U.S. Fish and Wildlife Service Coordinators:
Tom Shearer (361-994-9005, Tom_Shearer@fws.gov)

Primary Responsibilities of Lead Investigators

Name	Role
Dr. Donna Shaver National Park Service	Principle Investigator/Project Coordinator
Dr. Kim Reich Texas A&M University at Galveston	Lead Investigator for Bolivar Peninsula to Surfside
Dr. Andre Landry Texas A&M University at Galveston	Co-Lead Investigator for Bolivar Peninsula to Surfside
Dr. Michael Hooper USGS	NRDA, Restoration and toxicology support
Dr. Celine Godard-Codding Texas Tech University	Collection Support
Tom Shearer US Fish and Wildlife Service	Trustee representative, consultant on permitting

Data Collection Summary Outline

Turtles

- Collect blood from nesting females
- Satellite track inter-nesting and post-nesting movements
- Collect scute samples from nesting turtles
- Collect tissue samples from nesting turtles
- Take carapace swipes and oil samples from nesting turtles with visible signs of oil
- Describe and photograph any signs of illness or tumors on nesting turtles

Nests

- Collect intact cracked eggs
- Collect tissue samples from unhatched eggs and dead hatchlings
- Collect CAMs from dead late stage embryos and eggshells
- Collect gonads from dead embryos and late stage embryos
- Collect sand sample from nests

Nesting data

- Collect GPS points for every nest in two project sites

Deep Water Horizon NRDA - Kemp's Ridley Sea Turtle 2011 Field Program Budget		Year 2 Budget
Project/Item	**Unit**	**2011**
NATIONAL PARK SERVICE - PADRE ISLAND NATIONAL SEASHORE		
Project & NRDA coordination; monitor to ID and collect nests; encounter, sample and tag nesting females; obtain samples from incubated nests		
Supplies		
10 KIWI 101 PTT tags, including application supplies	2150	21,500
ARGOs Satellite time for 10 tags	2000	20,000
Biopsy supplies, consumables for needles, cryotubes, etc		500
Sample collection containers for tissues , vials, gloves,		3,047
Liquid Nitrogen Dewar, coolers		3,600
FedEx shipping		2,000
Fuel - $2000 a month x 5 months		10,000
Safety Supplies		5,000
Rental of 4 vehicles for 14 weeks	$400/wk	22,400
National Park Service - Padre Island National Seashore - TOTAL		**88,047**
TEXAS A&M RESEARCH FOUNDATION		
Monitoring; encounter, sample and tag nesting females; collection of samples		
Texas A&M staff		46,286
Satellite Time for 10 tags (based on history of 10 month retention times)	2000	20,000
Travel		3,000
Modified Total Direct Costs (MTDC)		69,286
Tuition (Part of graduate assistantship req'd by Texas State law)		3,543
Total Direct Costs		72,829
[redacted]		18,014
Texas A&M Research Foundation - TOTAL		**90,843**
USGS COLUMBIA ENVIRONMENTAL RESEARCH CENTER		
Project & NRDA management; Sample collection, processing and coordination		
Personnel		
Sample collection, field coord, data analysis		
Celine Godard-Codding, Texas Tech University		115,700
Embryo macro photography station		5,200
Shipping, sample handling/tracking		4,000
USGS CERC Direct Costs		124,900
USGS CERC Indirect Costs (40% of direct costs)		49,960
USGS Columbia Environmental Research Center		**174,860**
NOAA		
10 Wildlife Computer MK10 Fastlock GPS satellite tags (pre-paid)	5,000	**50,000**
NOAA		**50,000**
Deep Water Horizon NRDA - Kemp's Ridley Sea Turtle 2011 Field Program Budget		**2011 Pre-Assessment**
GRAND TOTAL		**403,750**

LITERATURE CITED

Seney, E.E., and A.M. Landry, Jr. 2008. Movements of Kemp's ridley sea turtles nesting on the upper Texas coast: implications for management. Endang Species Res 4:73-84

Shaver, D.J. and C. Rubio. 2008. Post-nesting movement of wild and head-started Kemp's ridley sea turtles (*Lepidochelys kempii*) in the Gulf of Mexico. Endang Species Res 4:43-55

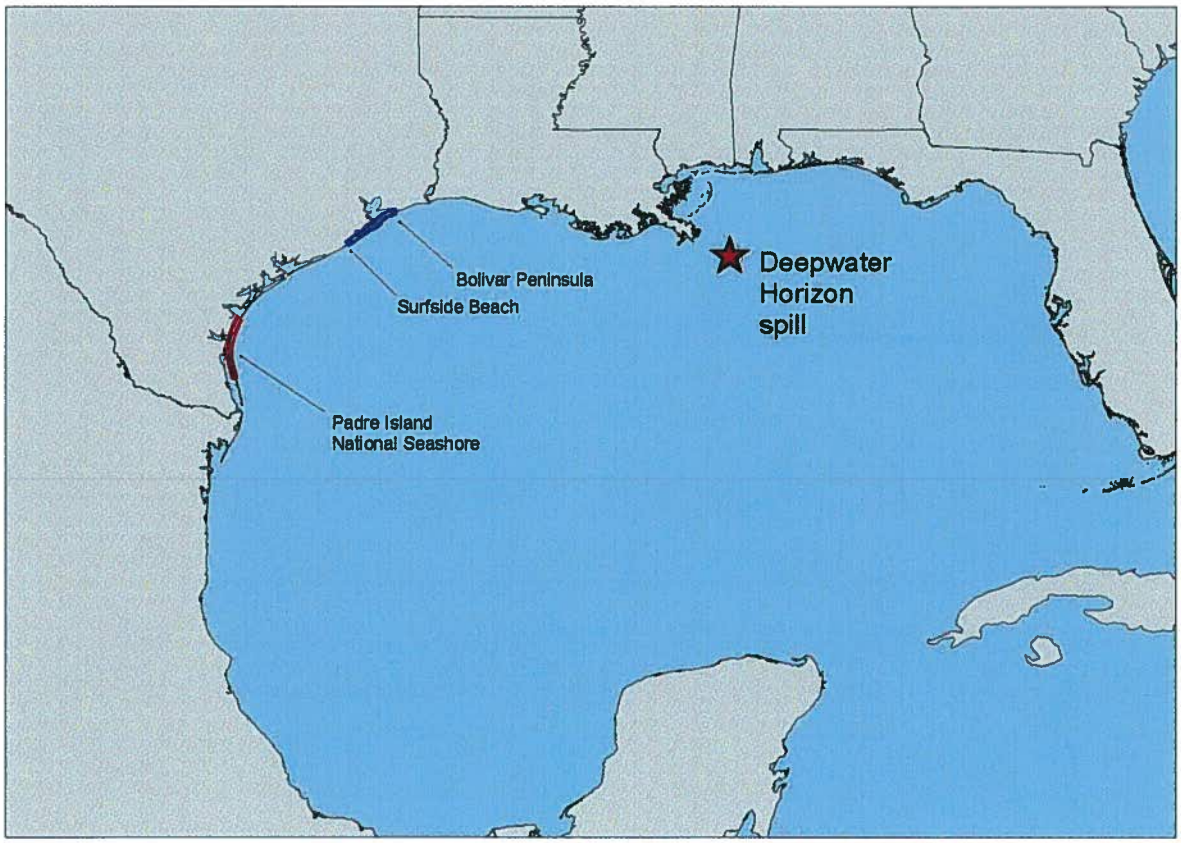

Figure 1. Bolivar Peninsula through Surfside Beach, and Padre Island National Seashore are the two primary study sites in Texas where potential oil impacts and injury to nesting Kemp's ridley turtles from the Deepwater Horizon spill will be assessed.

Appendix A

NRDA data collected for the Kemp's Ridley Sea Turtle Nesting Workplan in Texas

For nests:

Texas Clutch Number _____

Specific location _____

GPS _____

Grid # _____

Intact Cracked eggs _____, time collected _____

Sand sample collected? _____, time collected _____

Evidence of illness or tumors from external examination _____

For nesting turtles sampled:

Satellite tag # _____

Biopsy-tissue (1) collected? _____ If so, time collected _____

Biopsy-tissue (2) collected? _____ If so, time collected _____

Carapace swipe collected?_____ If so, time collected _____

Biopsy-scutes collected? _____If so, time collected _____

Blood collected? _____ If so, time collected _____

Carapace measurements

APPENDIX B

TEXAS SEA TURTLE NEST SAMPLE COLLECTION FORM

Nest and General Sampling Information Species: __*Lepidochelys kempii* _____

Nest No. 2011-TX-__ __ __ Nest Origination _____

Total # eggs in nest _____ No. of broken eggs pre-incubation _____

Hatching success ____/____ _____ % Emergence success____/____ _____ %

No. live hatchlings _____ No. deformed live hatchlings _____

No. dead hatchlings _____ No. deformed dead hatchlings _____

Check here if dead hatchling addendum page(s) is/are attached _____ No. of pages _____

No. unhatched eggs (not including broken, above) _____ No. deformed embryos _____

Nest Collection and Refrigeration ('Transfer') Date _____Time_____ Init. _____

Comments: _____

Sample Numbers: 2011-TX-_____-

Sample Collection Checklist

("X" if completed. Provide numeric details and comments as appropriate. For Y / N, circle one)

Sample Collection Date _____ Time _____ Sampler _____ Init. _____

__ **Pooled CAMs - Chemical Analyses** No. of CAMS in pool ____ **PC-Chem __**

Comments: _____

__ **Pooled CAMs – Metab. Analyses** No. of CAMS in pool ____ **PC-Met __**

Comments: _____

__ **Pooled CAMs (Frozen) - Biochemical Analysis** No. of CAMs in pool 1 ____ **PC1-N __**
No. of CAMs in pool 2 ____ **PC2-N __**

Comments: _____

__ **Pooled CAMs (Fixed) - Biochemical Analysis** No. of CAMs in pool 1 ____ **PC1-F __**
No. of CAMs in pool 2 ____ **PC2-F __**

Comments: _____

___ **Individual CAM Samples for Biochemical Analyses** No. of CAMs ____

Comments: _____ Frozen: **IC___-N through IC___-N**

_____ Formalin fixed: **IC___-F through IC___-F**

_____

General Comments: _____

_____

_____

_____

_____

_____

Sample Numbers: **2011-TX-________-**

Opportunistic Sample Collection

Sample Collection Date ________ Time _______ Sampler ____________________ Init. _____

___ **Whole Egg Composite** Total eggs in sample _____ No. eggs _____ No. yolks only _____

Comments: ____ **EC__**

___ **Late Stage Turtle Embryo Mortality (Goal: 2 embryos / nest / storage type)**

Embryo No. **E___** PAIS No. ______ Embryo Stage ________________ Photo? Y / N

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E___** PAIS No. ______ Embryo Stage ________________ Photo? Y / N

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E___** PAIS No. ______ Embryo Stage ________________ Photo? Y / N

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E___** PAIS No. ______ Embryo Stage ________________ Photo? Y / N

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E___** PAIS No. ______ Embryo Stage ________________ Photo? Y / N

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Sample Numbers: 2011-TX-__________-

___ **Late Stage Deformed Turtle Embryo Mortality (Collect all)**

Embryo No. **E__** **PAIS No.** ______ **Embryo Stage** ________________ **Photo?** **Y / N**

Deformity Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E__** **PAIS No.** ______ **Embryo Stage** ________________ **Photo?** **Y / N**

Deformity Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E__** **PAIS No.** ______ **Embryo Stage** ________________ **Photo?** **Y / N**

Deformity Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E__** **PAIS No.** ______ **Embryo Stage** ________________ **Photo?** **Y / N**

Deformity Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

Embryo No. **E__** **PAIS No.** ______ **Embryo Stage** ________________ **Photo?** **Y / N**

Deformity Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__** CAM Froz **CN__** Fixed **CF__**

Comments: ____

General Comments: ____

Sample Numbers: 2011-TX-________-

Dead Hatchling - Data and Sample Collection Addendum

___ **Hatchling Turtle Mortality**

Hatchling No. H____ PAIS No. __________ Photo? Y / N

Deformity? Y / N Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__**

Comments: ____

Hatchling No. H____ PAIS No. __________ Photo? Y / N

Deformity? Y / N Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__**

Comments: ____

Hatchling No. H____ PAIS No. __________ Photo? Y / N

Deformity? Y / N Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__**

Comments: ____

Hatchling No. H____ PAIS No. __________ Photo? Y / N

Deformity? Y / N Description ____

Gall bladder **G__** Yolk sac **Y__** Liver Froz **LN__** Fixed **LF__**

Comments: ____

Comments: ____

____