REQUEST FOR PROPOSALS

LOOP Environmental Monitoring: 2011-2013 Beach Elevation, Beach Vegetation, and Landloss and Habitat Change Surveys

PROBLEM STATEMENT

The LOOP pipeline system connects the offshore marine terminal to the Clovelly Salt Dome oil storage facility and LOCAP Inc. on the Mississippi River at St. James, Louisiana. It consists of 159 km (99 miles) of pipeline that traverse all major wetland types varying from salt, brackish, intermediate and fresh marshes to swamp forest. Since the construction of the Louisiana Offshore Oil Port (LOOP) in 1981, a statutory requirement has been that an Environmental Monitoring Program (EMP) be conducted to detect any adverse impact the pipeline, or its associated facilities, may have on the environment. Environmental monitoring has been conducted continuously since construction of the facility, and this RFP invites proposals to conduct monitoring for the period 2011-2013.

OBJECTIVES

The overall goal of the Environmental Monitoring Program is to identify whether the pipeline, or its associated facilities, are having an adverse effect on the environment. Environmental conditions are monitored at regular intervals over time but special surveys are conducted following catastrophic events such as a hurricane or a major oil spill. Contractors are requested to include the cost of observing the environmental impact of a catastrophic event as a contingency item.

The objectives of the EMP are to:

1. Acquire data that will allow identification of changes in the environment in the vicinity of the pipeline or its inland operational facilities, relative to changes in control areas unaffected by the pipeline;
2. Analyze the data to detect any changes in the environment that could be attributed to the pipeline or it's associated facilities;
3. Maintain sufficient data to determine the cause or causes of environmental damage or alterations, including events such as tropical storms or hurricanes, so that responsibility can be properly placed and corrective action taken as soon as possible; and,
4. Retain sufficient historical information to identify the long and short-term impacts of the deepwater port.

SCOPE OF WORK

The surveys to be conducted include a Beach Elevation Survey, a Beach Vegetation Survey, and a Land Loss and Habitat Change Survey. The individual surveys are described in greater detail below.

Beach Elevation Survey

Monitoring of erosion on the LOOP pipeline backfill at the beach crossing is to be conducted by measuring the beach topography using a grid of sample points between the beach and the inland marsh habitat. Beach elevations are to be sampled every year in May. A grid pattern has been established along the LOOP Pipeline crossing at Fourchon in the area between the beach and inland marsh as shown in figure 1. The centerline of the pipeline (PO in figure 1) is to be used as the principal axis of the grid pattern. The grid design consists of four parallel transects at 25-meter intervals on both sides of the pipeline for a total of nine transects intersected by 16 transects 25 meters apart and perpendicular to the center line along the pipeline corridor. The gridline started off with only 6 transects perpendicular to the pipeline but the grid has had to be extended inland due to a receding coastline. At each point on the grid, an "X-Y-Z" (latitude-longitude-elevation) observation is to be made except where the points are under water. These are primarily the green points in figure 1 because at the last survey, the blue points were under water and the yellow points were in the marsh area. Elevations must be recorded relative to the North American Vertical Datum standard of 1988. It should be noted that the coastline has receded and that some of the observation points in the grid are currently within the Gulf and, therefore, not of interest. The right is reserved to replace these inundated observation points with other points further inland although a total of 54 points will not be exceeded. As the grid moves, the distance between points should remain consistent. It is possible that the grid could change each year. The contractor will note any changes to the grid as well as any potential for breach observed during the field visit.

Figure 1: Gridline for survey points

Beach Vegetation Survey

Monitoring of vegetation on the LOOP pipeline backfill at the beach is to be conducted by determining the plant species present and extent of vegetation cover. Beach vegetation is to be sampled every two years in May, with the survey in this cycle being conducted in May, 2012. The grid pattern shown in figure 1 for points above water, must be used to identify the sample locations. A one-meter square plot must be established on each transect intersection and surveyed for plant species composition and percent vegetative cover.

Land Loss and Habitat Change Survey

Remote sensing methods are to be used to analyze coastal land loss and habitat conversion. Digital image processing, photogrammetry, and Geographic Information Systems (GIS) are to be used as the technical medium to monitor land loss and habitat change. Landscape pattern analyses, using standard landscape metrics such as fragmentation, edge density, and contagion can be used to explain the composition of habitat types in the ecosystem. Field reconnaissance must be conducted to verify the land types and habitat change. These field measurements can be conducted from a hovering helicopter to avoid gaining permission from landowners to enter onto their land. The measurement of habitat involves measurement of the composition and abundance of plant life as well as observation of the wetland type (salt, brackish, intermediate, and fresh marshes, bayous, swamp forests, cheniers, inland bays, and ocean shoreline). Wetland types can be identified remotely although on-site observation will be necessary to confirm remote observations. Similarly, remote observation of vegetation composition and abundance will require the establishment of procedures that permit the reliable interpretation of remote images in terms of vegetative biomass.

All data is to be projected and delivered in the Zone 15 North, North American Datum of 1983 (NAD83) system.

Color infrared aerial photography or multispectral imagery is to be procured for the project study area once every three (3) years and/or after a significant storm event. The survey is to be conducted late during the fall season (November-December) in 2009 and preferably at low water levels under optimal weather conditions. The resulting contact scale shall be 1:24000 (1”=2000’). Digitally ortho-rectified mosaic images are to be produced from this photography for inclusion in the analysis. This task includes scanning the frames using photogrammetric grade scanners at a resolution resulting in a ground resolution of not more than one (1) meter. Camera calibration reports are to be obtained and incorporated into the ortho-rectification process.

Orthophoto mosaic images are to be created using the individual resampled images from the ortho-rectification process. Only those frames needed to cover the study area are to be used. Each mosaic image is to cover an area of 3 miles wide and approximately 37 miles long, following the pipeline corridor. The pipeline location is to be centered in the mosaic images. Sufficient Ground Control Points (GCP) and habitat reconnaissance points using high-accuracy mapping grade Global Positioning System (GPS) are to be obtained. Landowner permission to access properties for field data collection will be obtained by LOOP.

Field surveys of the project area are to be conducted for the purpose of establishing training fields to be used in the image classification process. A minimum of 50 separate sites (including study and control sites) are to be field determined, verified, and incorporated into the analysis. Sites are to be located throughout the study areas in locations that are classified as land, located outside the hurricane protection levee, and within the vicinity of marsh vegetation changes as identified by Sasser, et.al. 2008. Since these points are located on both public and private lands, access may be difficult and therefore it is recommended that these sites be visited using a helicopter hovering over the site. Species composition are to be recorded at each site. Based on the vegetative species present, each sampling point is to be quantified into one of six classes: 1) saline marsh, 2) brackish marsh, 3) intermediate marsh, 4) fresh marsh, 5) forested, and 6) other. This format is similar to the coast-wide Vegetation Type Map of the Louisiana Coastal Marshes that has been conducted since 1949 at approximate 10-year intervals (1949, 1968, 1978, 1988, 1997 and 2001). A habitat map is to be generated based on the classification value of these points utilizing a statistical GIS spatial analysis system.

For the land loss and habitat change analysis, the existing study area consists of two components: 1) a 300-meter buffer (600-meter region) surrounding the pipeline and 2) a 300-meter buffer (600-meter region) surrounding a control transect (see Figure 2). The control transect parallels the pipeline 720 meters to the east. Both the study area and the control polygons contain the same spatial geometry. The study area is to be clipped from the original 600-meter study and control areas into smaller regions. The categories to be used are a 100-meter buffer of the pipeline (200-meter region), a 200-meter buffer (400-meter region), and a 300-meter buffer (600-meter region). Image classification for each mosaic image within the study area polygons is to be initiated.

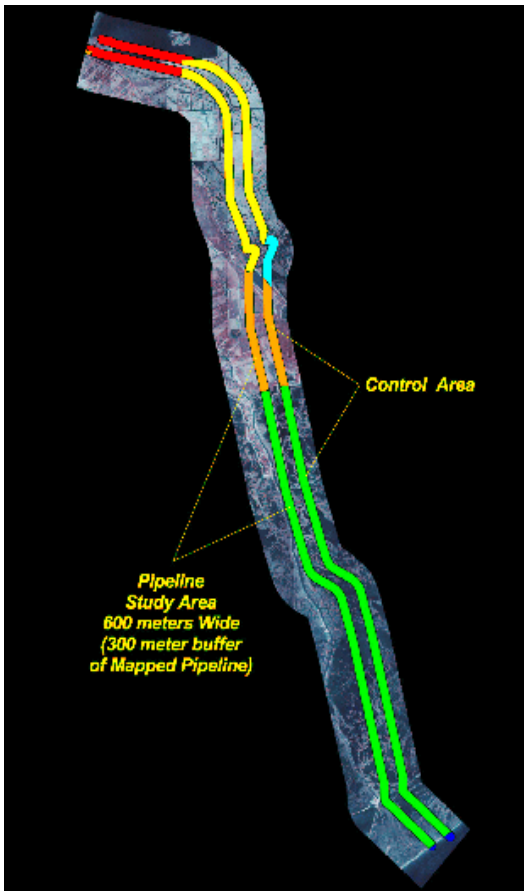

Figure 2: Experimental and Control Sections

Supervised classification for each mosaic image is to be performed within the 300-meter buffer zones for both the study and control regions selected. The classification is to result in two categories, land and water. All land regions are to be further classified by habitat type. Image filters are to be applied to all final classifications to remove 'salt and pepper' effect and any other noise, including sun glint. An accuracy report for each classification is to be calculated and must remain within the range of 75%–90%.

A quantitative land mass analysis classification, calculating the land mass acreage and the rates of land change occurring between the 2006 survey and the current survey is to be conducted. Habitat types are to be quantified and mapped. Results of land change and current habitat conditions are to be conveyed through a series of tables, charts and map production (11x17 minimum printed in color), both electronically and in hardcopy format. Results are also to be presented in tabular format for the 100-, 200-, and 300-meter study and control area buffers for each date. Each table is to show acreages for all six (6) habitat types identified by the habitat analysis. In addition, the table is to present the total percent change across all surveys and the rate of change between each survey date. The resulting habitat map is to serve as a baseline for all future studies in order to quantify changes to habitat types as well as changes in land and water.

A series of land change analyses are to be conducted between the survey dates. The results of the analysis are to be presented in the following categories: 1) Land Loss, 2) Land Gain, 3) Land Unchanged, and 4) Water Unchanged.

Monitoring after Catastrophic Events

Additional monitoring may be required following a catastrophic event. A "catastrophic event" for the purposes of this monitoring program is defined as a hurricane or major LOOP oil spill event (over 10,000 gallons inshore and 100,000 gallons offshore). An estimate of the cost of conducting a Beach Elevation, Beach Vegetation, and Land Loss and Habitat Change Survey following a catastrophic event must be itemized separately (i.e. a separate budget for each type of survey) and included with the proposal but not included in the budget for the scheduled surveys.

DELIVERABLES

The contractor is to provide a quarterly summary of proposed activity for each program quarter and details of how that activity is to be accomplished. Such schedule shall be submitted a minimum of 15 days prior to the commencement of each quarter. Within 30 days of the end of each quarter, with the exception of the last quarter, the contractor is to provide a summary of the activities completed during that quarter as well the results, recommendations and conclusions developed from those activities.

In lieu of a final quarter report the contractor is to provide a final report summarizing all activities completed during the project. This report is to contain a comprehensive comparative analysis of all data collected during the monitoring years and how it relates to the historical data. The report is to contain recommendations and conclusions developed from the comparative analysis performed. The report is to be completed within the monitoring contract period.

CONTRACT TIME

Thirty-six (36) months (includes 3 months for preparation of the final report)

AUTHORIZATION TO BEGIN WORK

January 1, 2011 (anticipated)

PROPOSAL FORMAT

All proposals must be formatted and executed in accordance with the LTRC Research Manual, 2003 edition (http://www.ltrc.lsu.edu/pdf/research_man03.pdf).

PROPOSAL SELECTION

A Project Review Committee selected for this project will review, evaluate and rank all proposals, employing the evaluation criteria listed in the proposal review form shown in figure 2-6 of the LTRC Research Manual, 2003 edition.

The contractor should address the following in the proposal:

1. Provide a proposed plan outlining the methodology to be utilized in data reduction and analysis for each individual component in the monitoring program.
2. Provide an outline delineating the required schedules and reports.
3. In addition to the overall budget documentation required in the Manual of Research Procedures, a separate breakdown of the budget by tasks as indicated in the scope of work is required.

DEADLINE FOR RECEIPT OF PROPOSALS

Submit 10 hard copies of the proposal and a CD containing an electronic copy of the proposal by 4.00 p.m. on Tuesday, November 30, 2010 to:

Mr. Harold R. Paul, Director
Louisiana Transportation Research Center
4101 Gourrier Avenue
Baton Rouge, LA 70808
(225) 767 9131 – office
Harold.paul@la.gov

CONTACT PERSON

Mr. Dale Sittig
Executive Director
Louisiana Offshore Terminal Authority (LOTA)
428 Hugh Wallis Road
Lafayette, LA 70508
(337) 262-6114 - Office
(337) 262-6214 - Fax
dale.sittig@la.gov

SPECIAL NOTES

1. The LTRC Manual of Research Procedures will be used to administer and manage this project. (http://www.ltrc.lsu.edu).

2. To equitably answer any questions regarding this Request for Proposals, the Louisiana Department of Transportation and Development (LADOTD) website, http://notes1/agrestat.nsf/WebAdvertisements?OpenPage will be updated with questions and answers and related documents regarding the project. The LADOTD makes these documents available for informational purposes only to aid in the efficient dissemination of information to

interested parties. The LADOTD does not warrant the documents against deficiencies of any kind. The data contained within this web site will be periodically updated. Interested parties are responsible to be aware of any updates. Questions regarding this RFP should be submitted in writing to the LTRC contact person. Questions must be received by close of business seven calendar days prior to deadline date.