

**UNITED STATES DEPARTMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE
GULF OF MEXICO OCS REGION**

NTL No. 2007-G01

Effective Date: February 15, 2007

NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL, GAS, AND SULPHUR
LEASES AND PIPELINE RIGHT-OF-WAY HOLDERS IN THE
OUTER CONTINENTAL SHELF, GULF OF MEXICO OCS REGION

Shallow Hazards Program

This Notice to Lessees and Operators and Pipeline Right-of-way Holders (NTL) is issued pursuant to 30 CFR 250.103 and supersedes NTL No. 98-20, dated September 15, 1998. It provides guidelines for using 3-D data and information instead of high-resolution data in water depths greater than 200 meters (656 feet), using the multichannel medium to acquire 2-D high-resolution survey data and processing it, submitting shallow hazards survey reports in digital format, moving vessels near pipelines, and using a state-of-the-art navigation system to depict potential hazards. This NTL also makes some technical amendments and updates cited regulatory authorities.

I. Introduction

Pursuant to 30 CFR 250.106, the Minerals Management Service (MMS) Gulf of Mexico OCS Region (GOMR) has established a shallow hazards program to ensure that you conduct exploration, development, production, and transportation operations with a minimum risk to human life and the environment. This NTL describes the surveys, reports, analyses, and mitigation that will ensure that the objectives of the shallow hazards program are met.

II. Shallow Hazards Assessments and Analyses

A. Exploration Plan (EP) and Development Operations Coordination Document (DOCD)

According to 30 CFR 250.214(f) and 250.244(f), you must include in your EP or DOCD a shallow hazards assessment for each well proposed at an unapproved surface location. Make sure that you include a shallow hazards assessment of a pipeline route in a pipeline application, not in a DOCD.

Include the following in each shallow hazards assessment for an EP or DOCD:

1. A discussion and review of all available geological and geophysical data within 300 meters (985 feet) of each proposed well site to a depth 760 meters (2,500 feet) below the seafloor or to the anticipated surface casing setting depth, whichever is deeper.

2. An assessment of any seafloor and subsurface geologic and manmade features and conditions that may have an adverse effect on the proposed well operations. Seafloor geologic hazards include fault scarps, gas vents, hydrate mounds, unstable slopes, slumping, active mud gullies (crown cracks, collapsed depressions), furrows, sinkholes, surface channels, and reefs. Subsurface geologic hazards include faults, gas-charged sediments, shallow-water flow, and buried channels. Manmade hazards include pipelines, wellheads, shipwrecks, ordnance, communication cables, and debris, including that caused by hurricanes.

3. If applicable, a specific discussion of mass movement of sediments, unstable slopes, active faulting, or gaseous sediments

4. A discussion of any special safety measures that would minimize the adverse effects of shallow hazards on the proposed well, including a discussion of how you will comply with the provisions of Section VI, paragraphs B and C, of this NTL.

5. An interpreted hazards map showing the annotated well locations.

6. A top-hole prognosis diagram, seafloor “rendering” or shaded relief map, and seafloor amplitude map if you are using 3-D seismic reflection data in lieu of high-resolution data to prepare the shallow hazards assessment.

B. Application for Permit to Drill

Under 30 CFR 250.418(h), the appropriate District Manager may require additional shallow hazards surveying and/or analysis to support an Application for Permit to Drill (Form MMS-123). The District Manager may also request to review original survey data.

C. Platform Site Investigation Report

In accordance with 30 CFR 250.906(d), you must prepare and submit for each platform an overall site investigation report that includes the findings of the shallow hazards survey required by 30 CFR 250.906(a).

D. Pipeline Application

In accordance with 30 CFR 250.1007(a)(5), a pipeline application must include a shallow hazards analysis that assesses the proposed route 150 meters (490 feet) on either side of the centerline to a depth of 23 meters (75 feet) below the seafloor for its entire length except for areas with acoustic void caused by biogenic gas.

1. Include the following in a shallow hazards analysis for a pipeline for which you conducted a specific pipeline pre-installation survey:

a. A shallow hazards report prepared according to Section IV, paragraph B, of this NTL; and

b. A discussion of any special safety measures that would minimize the effects of shallow hazards on the proposed pipeline, including a discussion of how you will comply with Section VI, paragraphs B and C, of this NTL.

2. Include the following in a shallow hazards analysis for a pipeline for which you did not conduct a specific pipeline pre-installation survey:
 - a. A discussion of the specific data and reports you used to make the analysis;
 - b. An assessment of any seafloor and subsurface geologic and manmade features and conditions that may have an adverse effect on the proposed pipeline;
 - c. A discussion of any special safety measures that would minimize the adverse effects of shallow hazards on the proposed pipeline, including a discussion of how you will comply with Section VI, paragraphs B and C, of this NTL; and
 - d. An interpreted hazards map showing the annotated pipeline route.

To provide sufficient information on which to base a shallow hazards analysis for all right-of-way (ROW) pipelines, and for lease term pipelines in water depths 200 meters or greater, conduct a pipeline pre-installation survey, as prescribed in Section III, paragraph C.4, of this NTL. For lease term pipelines in water depths less than 200 meters (656 feet), you may not need to conduct a pipeline pre-installation survey if you can make a thorough analysis using geological and geophysical data or information (seafloor man-made obstructions) from an updated lease survey or site-specific survey conducted using state-of-the-art equipment and a navigation system based on the Global Positioning System (GPS). If you are uncertain about the adequacy of available data or information to prepare an acceptable analysis for a lease term pipeline, you may contact the MMS GOMR TAOS Section for guidance before you submit the lease term pipeline application.

III. Shallow Hazards Surveys

A. Introduction

Make sure you perform your shallow hazards field surveys by using the navigation systems, patterns, and instrumentation described in paragraphs B through D below. Since shallow hazards surveys are similar to other surveys (e.g., archaeological resource and live-bottom), the MMS GOMR encourages you to conduct the surveys concurrently (see [NTL No. 2005-G07](#), effective July 1, 2005). If you have been directed by the MMS GOMR to conduct a shallow hazards survey, but you would like to use a survey pattern or survey data acquisition instrumentation different from that specified in this NTL, submit a written request (30 CFR 250.142) to the MMS GOMR TAOS Section for approval. In your request, include a description of the alternate pattern or instrumentation and a discussion of your rationale.

B. Navigation

Use a state-of-the-art navigation system that can continuously determine the surface position of the survey vessel. Ensure that the precision of the navigation system is ± 5 meters (16 feet). Continuously log position fixes digitally along the vessel track and annotate them on all records at intervals no greater than 150 meters (490 feet). For surveys you conduct in water depths 200 meters (656 feet) or greater, use an acoustic positioning system for the deep tow system or AUV to ensure accurate mapping of any recorded contacts.

C. Pattern

Design the pattern for each type of shallow hazards survey to cover the area of anticipated physical disturbances. This area includes, but is not limited to, the area within which drilling vessel or pipeline-lay barge anchors may be placed, but does not include the area within which work boat anchors will be placed or the area within which similar minimal disturbances may occur.

Use the following survey patterns when you conduct a high-resolution shallow hazards survey:

1. Lease Survey - When it is likely that you will conduct multiple operations on the lease, it may be advantageous for you to conduct a lease survey. A lease survey covers the entire area of a lease, as well as areas external to the lease to provide coverage of an area 300 meters (985 feet) around any wellsite, and areas within which activities may cause physical disturbances. Run a lease survey along parallel lines spaced at a maximum of 300 meters (985 feet) with cross lines spaced at a maximum of 900 meters (2,950 feet).

2. Site-Specific Survey - A site-specific survey covers an area at least 1,800 meters (5,900 feet) square centered upon a proposed drilling or platform site, as well as that portion external to the square within which activities may cause physical disturbances. Run a site-specific survey along parallel lines spaced at a maximum of 300 meters (985 feet) with three equidistant cross-tie lines. You may not need to conduct a site-specific survey in any area sufficiently covered by a lease survey conducted using state-of-the-art equipment and a navigation system based on the Global Positioning System (GPS).

3. Seafloor Obstruction Survey - Before you begin operations involving MODU's, pipeline-lay barges, and anchor-handling vessels, you may need to conduct a seafloor obstruction survey to locate existing pipelines and other potential hazards. You do not need to conduct a seafloor obstruction survey if the data from previously conducted surveys are adequate to accomplish this purpose. Run a seafloor obstruction survey for a well or platform in an area at least 300 meters (985 feet) square with three equidistant primary lines and at least one cross line. Run a seafloor obstruction survey for a pipeline using the same pattern as that required for a pipeline pre-installation survey described in paragraph No. 4 below. For operations in water depths 200 meters (656 feet) or greater, you may need to conduct the seafloor obstruction survey by using a deep tow system or autonomous underwater vehicle (AUV).

4. Pipeline Pre-installation Survey - The survey pattern for a pipeline pre-installation survey consists of a line run along the proposed pipeline route (centerline), an offset parallel line on one side of the centerline located approximately 50 meters (165 feet) from the centerline, and at least two additional offset parallel lines (on either side of the centerline) spaced at a maximum of 300 meters (985 feet). Make sure that the number of offset parallel lines is sufficient to provide coverage of the entire area that could be disturbed physically by your pipeline construction activities.

D. Data Acquisition Instrumentation

Make sure that geophysical instrumentation for shallow hazards surveys represents state-of-the-art technological development. Deploy it in a manner that minimizes interference between the

instrumentation systems. Record all data digitally at a sampling rate of at least one sample per second. Interface all data recorders to the navigation system to ensure proper integration of information. Ensure that all instruments are adequately tuned and that all recorded data are readable, accurate, and properly annotated. Use the following instrumentation when you conduct a shallow hazards survey:

1. Depth Sounder

A high-frequency, narrow-beam depth sounder to obtain bathymetry. Set up the depth sounder system to record with a sweep appropriate to the range of water depths expected in the survey area. You may also use a multibeam bathymetry system in lieu of a high-frequency, narrow-beam depth sounder if you need to obtain continuous bathymetric data of 100 percent of the survey area. The MMS GOMR encourages you to use a multibeam bathymetry system in areas where the seafloor is complex or in areas where pinnacles or reef structures exist.

2. Magnetometer

For a shallow hazard survey you conduct in a water depth less than 200 meters (656 feet), a total field intensity magnetometer to determine the presence of pipelines and other magnetically susceptible objects. Tow the magnetometer sensor as near as possible to the seafloor (no more than 6 meters (20 feet)) and in a manner that minimizes interference from the vessel hull and the other survey instruments. Ensure that the magnetometer sensitivity is 1 gamma or less. Make sure that the background noise level does not exceed a total of 3 gammas peak to peak.

3. Sidescan Sonar

A digital dual channel sidescan sonar system with dual frequency of nominal 100 and 500 kHz to record continuous planimetric images of the seafloor. Correct for slant range and ship speed to provide a true plan view. Mosaic the recorded data in areas of complex seafloor relief and unknown manmade debris. Output the mosaics by using the digital map format described in the last paragraph of Section IV.A. of this NTL. Operate the system in a manner that provides 100 percent coverage of the seafloor in the survey area.

Tow the sidescan sonar sensor above the seafloor at a distance that is 10 to 20 percent of the range of the instrument. The following table provides suggested coverage areas.

Height Above Seafloor	Range at 10 Percent of Fish Altitude	Range at 20 Percent of Fish Altitude
5 meters	50 meters/channel	25 meters/channel
10 meters	100 meters/channel	50 meters/channel
15 meters	150 meters/channel	75 meters/channel
20 meters	200 meters/channel	100 meters/channel

Ensure that the line spacing and display range you use are appropriate for the water depth. In addition, ensure that the data you obtain are of such quality as to permit detection and evaluation of seafloor objects and features within the survey area.

Further, make sure that the vertical sound beam width is appropriate to the water depth, and the horizontal sound beam width provides optimum resolution. Tune the instrument to enhance echo returns from small nearby objects and features without sacrificing the quality of echo returns from more distant objects and features.

For shallow hazards surveys, you do not need to use a sidescan sonar for a lease survey or a site-specific shallow hazards survey you conduct in a water depth 200 meters (656 feet) or greater.

For a pipeline pre-installation shallow hazard survey you conduct in a water depth 200 meters (656 feet) or greater, run the sidescan sonar with a deep-tow system or use an AUV in lieu of running it with a cable-towed fish.

4. Shallow Penetration Subbottom Profiler

A subbottom acoustic profiler system to determine the character of near-surface geological features. Make sure that the subbottom profiler system is capable of achieving a resolution of vertical bed separation of at least 1 foot in the uppermost 15 meters (50 feet) below the mudline.

For a pipeline pre-installation survey you conduct in a water depth 200 meters (656 feet) or greater, run the shallow penetration subbottom profiler with a deep tow system or use an AUV in lieu of running it with a hull-mounted sonar sensor.

5. Medium Penetration Seismic Profiler

A profiler system to determine the character of deeper geological features. Make sure that the profiler system is capable of penetrating at least 750 meters (2,460 feet) or to any potential surface casing depth, whichever is greater, and that the vertical resolution is less than 6 meters (20 feet). Tow the profiler system cable and source no more than 3 meters (10 feet) from the water surface. The recording sample interval should be no greater than 1 millisecond. Make sure that the maximum offset range is no less than the total depth of interest for shallow hazards evaluation.

Make sure that the seismic source delivers a simple, stable, and repeatable signature that is near to minimum phase output with usable frequency content across the 20 to 300 Hz band. A single-channel CHIRP boomer seismic profiler might be more practical in water depth less than 15 meters (50 feet). The MMS GOMR discourages your use of a sparker as an acoustic source unless it demonstrates a high quality signature.

Effective May 1, 2007, acquire the data digitally (24 channels or more). Process the data (time migration) to enhance the interpretation.

You do not need to run a medium penetration profiler system for seafloor obstruction surveys and pipeline pre-installation surveys, as discussed in paragraphs C.3 and C.4 of this section.

6. Three-dimensional (3-D) Seismic Reflection Surveys

For areas in water depths greater than 200 meters (656 feet), you may not need to use a shallow penetration subbottom profiler or a medium penetration seismic profiler (see Items Nos. 4 and 5 above) if you have previously run a 3-D seismic reflection survey over 100 percent of the area. If you believe that your 3-D data and information can substitute for the subject high-resolution data, submit a written request (30 CFR 250.142) to the MMS GOMR TAOS Section for approval before you evaluate shallow hazards on the basis of 3-D data and information. In your request, provide a sample of the seismic lines and a seafloor “rendering” or shaded relief map for a potential well or platform site, a power spectrum diagram, the sampling rate, acquisition parameters (e.g., cable, source depth), the year the survey was run, and the type of processing used. The MMS GOMR TAOS Section may also request that you perform further processing to enhance the resolution if the area is complex (numerous faults, gas vents, slumps, hard bottoms, etc.). Please be advised that the MMS GOMR TAOS Section will not approve requests to substitute 3-D data and information for high-resolution data for pipeline pre-installation surveys.

The MMS GOMR will use the following acceptability criteria in determining whether 3-D data and information can be substituted for high-resolution shallow penetration subbottom profiler and a medium penetration seismic profiler data.

- (a) The 3-D data provide a sufficiently resolute image of the shallow section to allow a clear analysis of the shallow conditions.
- (b) The data are loaded to a workstation at no less than 16-bit (preferably 32-bit) data resolution and are unscaled.
- (c) There is no form of trace and/or sample decimation of the original processed volume.
- (d) The original processed sample interval and bin size are maintained throughout the area.
- (e) The dataset possesses a frequency content of 50 Hz or more across the first second of section below the seafloor.
- (f) Seafloor reflection is free of gaps and defined by a wavelet of stable shape and phase to allow auto-tracking of the seafloor event with minimum user intervention and guidance.
- (g) Acquisition artifacts such as cross-line statics and/or amplitude striping, though possibly identifiable in shallow section, do not detract from the overall interpretation of the picked event when mapped in time or amplitude. Similarly, time slices or windowed attribute extractions are devoid of, or show minimal, acquisition artifacts to the detriment of their interpretation.
- (h) Merge points between datasets of differing origin or vintage that cross the area are marked by minimal, preferably no, time shifts or amplitude changes across the join that might otherwise be to the detriment of the interpretation.
- (i) Processed bin sizes are less than 40 meters in both the inline and crossline dimension.
- (j) The processed output sample interval is 4 milliseconds or less;
- (k) Attention to definition of an accurate velocity model in the shallow section in processing allows optimum structural and stratigraphic resolution to have been achieved in the 3-D migrated volume. The shallow section shows no indication of under or over migration artifacts.

(l) Multiple energy is unidentifiable or at a level that does not interfere with the analysis of the shallow section.

(m) The minimum coverage area for 3-D data coverage is the same as that for high-resolution surveys set forth in Section III, paragraphs C.1 and C.2 of this NTL.

7. Additional Investigations

Under certain conditions, the MMS GOMR may direct you to use additional instrumentation and methods, such as divers, coring, remote or manned submersibles, video cameras on ROV's, and additional geophysical survey lines.

8. Archaeological Discoveries

In accordance with 30 CFR 250.194(c), if you discover manmade debris that appears to indicate the presence of a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of manmade objects [such as bottles or ceramics], piles of ballast rock) within or adjacent to your lease area or pipeline right-of-way during your shallow hazard survey, seafloor obstruction survey, diver inspection, or ROV inspection, you must immediately halt operations, take steps to ensure that the site is not disturbed in any way, and contact the MMS GOMR Regional Supervisor, Leasing and Environment, within 48 hours of its discovery. You must cease all seafloor-disturbing operations within 305 meters (1,000 feet) of the site until the Regional Director instructs you on what steps you must take to assess the site's potential historic significance and protect it.

IV. Shallow Hazards Survey Reports

A. Introduction

According to 30 CFR 250.214(e) and 250.244(e), you must include in your EP or DOCD a shallow hazards survey report (or a reference to a previously submitted report) based on the information obtained from your shallow hazards survey. According to 30 CFR 250.1007(a)(5), you must include a shallow hazards survey report in an ROW pipeline application.

In the shallow hazards survey report, include an evaluation and synthesis of the data you gathered during the shallow hazards survey and integrate it with other available geological and geophysical information with compatible local projections. Make sure that the report is prepared, signed, and dated by a geophysicist or geologist specializing in high-resolution geophysical interpretation. Ensure that these professional personnel have the credentials and experience sufficient to qualify them to perform the necessary work. As needed, specialists in other fields may participate in data analysis and report preparation. The MMS GOMR encourages you to combine shallow hazards survey reports with archaeological resource reports (see [NTL No. 2005-G07](#), effective July 1, 2005), when required, since these reports are similar. You do not need to prepare a shallow hazards survey report for a seafloor obstruction survey, as discussed in Section III, paragraph C.3, of this NTL.

To minimize possible delays in the review of your EP or DOCD by the MMS GOMR, you may submit a shallow hazards survey report to the MMS GOMR Plans Section (reports for lease surveys or site-specific surveys) before you submit the related EP or DOCD.

Whether you include the report with your EP, DOCD, or pipeline application or submit it separately in advance, provide an original, hard copy report and an identical copy (two (2) copies if an archaeological report is also included). If the EP or DOCD proposes activities in water depths greater than 400 meters (1,312 feet), provide an additional copy. In lieu of submitting a hard copy report, you may prepare the report in digital format and submit a CD-ROM (two (2) separate CD-ROM's if an archaeological report is also included). If the EP or DOCD proposes activities in water depths greater than 400 meters (1,312 feet), provide an additional CD-ROM. Submission of shallow hazards reports in digital format may expedite the review of your EP, DOCD, or pipeline application.

If you submit your shallow hazards report on CD-ROM's, make sure that it is a complete report (including all text, maps, sample seismic lines, and other graphics). Submit it as a non-editable (read-only) digital file in portable document format (PDF) with hyperlinks to maps and seismic data examples to facilitate storage, review, and plotting. Prepare the digital copy of all survey maps as drawing (DWG) files, shape files, or GeoTIFF files oriented to the North American Datum of 1927 (NAD 27) coordinate system. Make sure that the data are compatible with ArcGIS9.1. Submit the computer-aided design (CAD) files in layers as shown in the [Appendix to this NTL](#).

B. Report Contents

Include the following information in your shallow hazards reports:

1. Area Description

A description of the area that you surveyed that includes the

- (a) OCS lease number(s), block number(s), and lease area(s); and
- (b) minimum and maximum water depths of the survey area.

2. Personnel List

A list of the individuals involved in survey planning, fieldwork, and report preparation, and a brief description of their duties.

3. Survey Description

A discussion of the shallow hazards survey that includes

- (a) a brief description of the navigation system with a statement of its estimated accuracy for the surveyed area;
- (b) a brief description of survey instrumentation including scale and sensitivity settings, sampling rates, and tow heights off the seafloor for the magnetometer and sidescan sonar sensors;

- (c) a description or diagram of the survey vessel, including its size, sensor configuration, navigation antenna location, cable lengths, and distances from sensors to navigation antenna;
- (d) vessel speed and course changes;
- (e) sea state and weather conditions;
- (f) a copy of the daily survey operations log;
- (g) a description of survey procedures, including a statement of survey and record quality, a comparison of data from survey line crossings, and a discussion of any problems that may have affected the ability of the geophysicist or geologist to identify and analyze shallow hazards in the surveyed area; and
- (h) an explanation if you were unable to follow the survey line spacing or instrumentation guidelines of this NTL.

4. Maps

A map or separate maps at a scale of 1:12,000 (or 1:24,000 if the survey report involves multiple OCS blocks) and oriented to true north. Include on the map:

- (a) a navigation post-plot of the surveyed area, showing lease block lines, latitude-longitude reference coordinates, survey lines and directions, and navigational shotpoints at intervals of no more than 150 meters (490 feet);
- (b) bathymetry (at contour intervals of 0.3 meters (1 foot) to 15 meters (50 feet) depending on seafloor morphology);
- (c) shallow geologic features;
- (d) deep geologic structure (from medium penetration profiler data);
- (e) sidescan sonar contacts (use map symbol ☒);
- (f) magnetic anomalies (use map symbol ▲);
- (g) areas of shallow gas;
- (h) sites of proposed oil and gas operations (e.g., well locations, platform sites, and lease term pipelines), when available at the time of report preparation;
- (i) sites of former oil and gas operations (e.g., abandoned wells, removed platforms, and decommissioned pipelines); and
- (j) for pipeline pre-installation surveys, the x and y coordinates of the origin and terminus of the proposed pipeline route and the points where the route crosses safety fairway and anchorage area boundaries, existing pipelines, OCS block lines, and the Federal/State boundary.

5. Assessment

An assessment of the potential for shallow hazards within the surveyed area, including but not limited to, discussions of

- (a) the general geological background;
- (b) oil and gas activity, including wells, platforms, and pipelines;
- (c) bathymetry;
- (d) seafloor features, including sidescan sonar contacts or ROV video documentation;
- (e) geological structure, including faults, river channels, and karst areas;
- (f) shallow gas, gas hydrate, and shallow-water flow;
- (g) magnetic anomalies; and
- (h) unstable seafloor areas.

6. Magnetic Anomaly Table

A table of all magnetic anomalies of unknown source. The following table provides a suggested format:

No.	Area/ Block	Line No./ Shot Pt.	Tow Height (ft)	Signature	Intensity (Gammas)	Dura- tion (ft)	NAD27 Lat/Long Dec./Deg.*	NAD 83 Lat/Long in Dec./Deg.*	Min. Avoid. Distance (ft)
1	WD 36	Line 6 Sp 12.5	23	Dipole	49	100	29.456823° -90.234545°	29.456823° -90.234545°	100

* Provide lat/long to six decimal places.

Make sure that you provide the information in this table in comma delimited text files.

7. Sidescan Sonar Contact Table

A table of all sidescan sonar contacts of unknown source. The following table provides a suggested format:

No.	Area/ Block	Magnetometer Association	Dimension LxWxH (ft)	Shape	NAD 27 Lat/Long in Dec./Deg.*	NAD 83 Lat/Long in Dec./Deg.*	Min. Avoid. Distance (ft)
1	WD 36	Line 6, Sp 12.5	50x20x5	Linear	29.456823° -90.234545°	29.456823° -90.234545°	100

* Provide lat/long to six decimal places.

Make sure that you provide the information in this table in comma delimited text files.

8. Data Samples

Representative data samples from each survey instrument to demonstrate the quality of the records.

9. Summary

A summary of conclusions and recommendations supported by the survey data and analyses, including a discussion of known or potential shallow hazards and areas to be avoided or that may require further investigations.

10. 3-D Seismic Reflection Data

If you are using 3-D seismic reflection data to prepare your report in lieu of high resolution data, information that includes

- (a) a discussion of the regional geologic setting and seafloor and subsurface conditions;
- (b) examples of interpreted seismic sections;
- (c) a discussion of the acquisition and processing of the 3-D seismic data you used;
- (d) a bathymetry map;

- (e) a seafloor “rendering” or shaded seafloor features;
- (f) seafloor amplitude; and
- (g) a time to depth conversion table for surveys in frontier areas.

V. Original Survey Data

Retain all original shallow hazards survey data for a lease and make it available upon request to us at any time prior to lease termination. Retain the original survey data for a pipeline ROW until the MMS GOMR notifies you that the as-built location report is acceptable.

VI. Mitigation of Potential Shallow Hazards

A. EP’s, DOCD’s, and Pipeline Applications

When a shallow hazards survey and report and/or shallow hazards assessment or analysis review by the MMS GOMR indicates a potential hazard within the immediate area (see below for description of “immediate area”) of your proposed operations, select one of the following three alternatives:

1. Amend your EP, DOCD, or pipeline application to locate the site of the operations to avoid the potential shallow hazard;
2. Demonstrate to the MMS GOMR that the use of special protective measures will minimize the risk to safe operations; or
3. Establish, on the basis of further investigation using such equipment and techniques the MMS GOMR deems necessary, that such operations will not be adversely affected by the shallow hazard.

For magnetic anomalies with an intensity 50 gammas or greater and sidescan sonar contacts, the immediate area is the area inside a circle centered on the feature with a radius of 30 meters (100 feet). You may change this avoidance distance depending upon the signature, intensity, ambient magnetic field, and duration of any individual anomaly or contact.

For geologic features (e.g., shallow faults, shallow gas, the edge of a surface channel [not applicable for pipelines], a hydrate mound, a fluid expulsion mound, a mud volcano, a sink hole, a crown crack, a collapse depression, the nose of mud lobe, an active mud slide, a fault scarp), the immediate area includes any site located within 75 meters (245 feet) of the feature.

B. Onsite Preparation

1. Use state-of-the-art, real-time navigational positioning equipment (e.g., DGPS) on all MODU’s, pipeline construction vessels, derrick barges, and anchor-handling vessels associated with your operations to depict existing pipelines and other potential hazards.
2. In lieu of using real-time navigational positioning equipment, as described in paragraph No. 1 above, you may buoy all existing pipelines and other potential hazards located within 150 meters (490 feet) of the operation (including anchor patterns) or outline with buoys a

safe working area large enough to accommodate your proposed operations if the area is highly congested with pipelines or debris.

3. In addition, prepare a plat with a minimum scale of 1:12,000 depicting the location of the proposed activity, all associated anchor patterns, and existing pipelines or other potential hazards in the area. Provide copies of this plat to key personnel on all MODU's, pipeline construction vessels, derrick barges, and anchor-handling vessels associated with your operations.

C. Moving a Mobile Drilling Unit Near Existing Pipelines

1. If you plan to move a MODU within 150 meters (490 feet) of an existing pipeline that is near a platform, make sure that the move takes place only during daylight hours.

2. If you move a MODU leg or mat within 30 meters (100 feet) of any existing pipeline, use (a) reflectors to depict the location of buried pipelines and (b) a real-time acoustic imaging sonar scan while approaching the location.

3. While approaching the location, do not lower or drag the MODU legs or mat until the vessel is on location.

4. Before departing the location, fully raise the vessel legs or mat.

Paperwork Reduction Act of 1995 Statement

The collection of information referred to in this NTL provides clarification, description, and interpretation of requirements contained in 30 CFR 250, subparts A, B, D, I, and J. The Office of Management and Budget (OMB) has approved the information collection requirements in these regulations and assigned OMB Control Nos. 1010-114, 1010-0151, 1010-0141, 1010-0149, and 1010-0050, respectively. This NTL does not impose additional information collection requirements subject to the Paperwork Reduction Act of 1995.

Contacts and Mailing Addresses

A. Contacts

The following chart provides contact names, telephone numbers, and e-mail addresses if you have any questions on shallow hazards surveys or reports.

For...	Contact...	At...	Or at...
Shallow hazards reports in EP's and DOCD's	Mr. Nick Wetzel	Nick.Wetzel@mms.gov	(504) 736-2419
Shallow hazards reports in pipeline applications	Mr. Alex Alvarado	Alex.Alvarado@mms.gov	(504) 736-2547

Conducting shallow hazards surveys or preparing shallow hazards reports	Mr. Adnan Ahmed Dr. William Kou	Adnan.Ahmed@mms.gov William.Kou@mms.gov	(504) 736-2501 (504) 736-2703
Reporting any shipwreck discovered while conducting a shallow hazards survey	Mr. Joseph Christopher	Joseph.Christpher@mms.gov	(504) 736-2759

B. Mailing Addresses

The following provides the mailing addresses for the respective MMS GOMR offices where you submit shallow hazards reports and any requests regarding shallow hazards surveys or reports.

For...	Insert in blank space below
MMS GOMR Plans Section	Plans Section (MS 5230)
MMS GOMR Pipeline Section	Pipeline Section (MS 5232)
MMS GOMR Technical Assessment and Operations Support (TAOS) Section)	TAOS Section (MS 5220)

U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region
Office of Field Operations
Attention: _____
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394

[original signed]

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Appendix

Format for Digital Maps

Group 0

Label the first layer as the base map or number zero (0). This layer is the base layer on which all other layers are created. It contains the background data used for plotting features, lines, points, etc. It is not the layer on which points, lines, features, labels, etc. are visible.

General Information Group (layers 100-199)

Layers 100 through 199 contain all pertinent reference information found on the map (including labels, block lines, and other reference information for the overall map). This layer is separate from the location of data features on the map. It serves only as a legend and background information for understanding the data placed on the overall map. Include the following layers in this group:

1. Overall legend including all symbols used for depiction of
 - (a) infrastructure such as pipelines and wellheads;
 - (b) biological features including live bottoms, topographic features, and chemosynthetic communities;
 - (c) geophysical characteristics such as acoustic voids or faults; and
 - (d) other features such as unidentified magnetic anomalies and sidescan sonar targets (with avoidance radii), buried channels, and shipwrecks.

2. Make sure that each item keyed into a legend and appears as a separate layer within one of the following items:
 - (a) project area map;
 - (b) map scale;
 - (c) map title;
 - (d) company names;
 - (e) personnel names, dates, file and job numbers, and map numbers (e.g., map 1 of 2);
 - (f) map borders;
 - (g) north arrow;
 - (h) OCS area name(s) and block number(s);
 - (i) lease numbers;
 - (j) Federal/State boundaries;
 - (k) graticules used in delineating latitude and longitude;
 - (l) tic marks used to delineate State plane or UTM coordinates;
 - (m) table of unidentified sonar targets depicted on the map (when appropriate); and
 - (n) table of unidentified magnetic anomalies (when appropriate).

Infrastructure Group (layers 200-299)

Layers 200 through 299 contain all industry infrastructure. Place all labels pertaining to infrastructure in this group on a separate layer (i.e., all pipeline, borehole, well, structure removal labels may be on one layer and that layer located within the category of infrastructure). Include the following layers in this group:

- (a) pipelines;
- (b) boreholes;
- (c) capped wells;
- (d) proposed activities;
- (e) fairways and anchorage areas; and
- (f) removed structures.

Navigation Data and Bathymetry Group (layers 300-399)

Layers 300 through 399 contain the post-plot of the navigation data as well as all bathymetric data. Place all labels pertaining to the post-plot of navigation data or bathymetry data in this group on a separate layer (i.e., all shot points and line labels may be on one layer and that layer located within the category of navigation data). Include the following layers in this group:

- (a) survey lines and shot points; and
- (b) bathymetry data.

Seafloor Features Group (layers 400-499)

Layers 400 through 499 contain all of the geological features and unidentified sidescan sonar targets and magnetic anomalies located by the shallow hazards survey. Identify these features and anomalies with their appropriate symbols. Place all labels pertaining to these individual features in separate layers (magnetic anomalies have a layer that has only labels corresponding to the individual magnetometer targets; unidentified sidescan sonar contacts have their own label layer; etc.). Include the following layers in this group:

- (a) unidentified sidescan sonar contacts (use map symbol ☒);
- (b) unidentified magnetic anomalies (use map symbol ▲);
- (c) artificial reefs and artificial reef planning areas;
- (d) seafloor fluid expulsion features and gas vents;
- (e) brine seeps and brine pools;
- (f) seafloor scarps with height;
- (g) mounds and pinnacles;
- (h) organic reefs and relict reefs;
- (i) deepwater coral locations (e.g., *Lophelia* reefs);
- (j) outcrops and hard bottoms;
- (k) live bottoms (pinnacle trend);
- (l) named topographic features and their protection zones;
- (m) seafloor faults;
- (n) areas of seafloor slumping, debris flows, mud slides, and collapse depressions;
- (o) seafloor hydrate mounds;
- (p) scour and furrows;

- (q) natural and dredged channels; and
- (r) other seafloor features and anomalies (e.g., shipwrecks, pockmarks, can holes).

Subsurface Features Group (layers 500-599)

Layers 500-599 contain all subsurface features located by the shallow hazards survey. Place all labels pertaining to these individual features in separate layers (e.g., all labels for channel margin features should be on one layer). Include the following layers in this group:

- (a) buried faults with depth labels;
- (b) shallow gas as seen on shallow penetration subbottom profiler (acoustic voids);
- (c) shallow gas as seen on medium penetration seismic profiler or conventional seismic reflection data (2-D or 3-D) (high amplitudes, bright spots) with depth labels;
- (d) buried slumping;
- (e) buried hydrates (e.g., bottom simulating reflector (BSR), seismic blanking);
- (f) shallow waterflow zones;
- (g) salt;
- (h) significant geologic features;
- (i) karst features; and
- (j) buried channel features.