

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

**NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL AND GAS LEASES IN THE ALASKA  
OUTER CONTINENTAL SHELF REGION**

**NTL 00-A01**

Effective Date: February 7, 2000

**SHALLOW HAZARDS GEOPHYSICAL SURVEY AND EVALUATION FOR OCS  
EXPLORATION AND DEVELOPMENT DRILLING**

**Introduction**

The Minerals Management Service (MMS) Regional Supervisor for Field Operations (RS/FO) requires pre-exploratory and pre-development investigations by lessees/operators (you) on leased lands to ensure safe conduct of oil and gas operations on the Outer Continental Shelf (OCS). *Before beginning drilling or platform construction activities you must conduct a shallow hazards analysis to evaluate the proposed site for potentially hazardous conditions at or below the sea floor, which could affect the safety of OCS operations. Unless you can demonstrate to us that sufficient data is available to evaluate the site, we will require a shallow hazards geophysical survey.*

Potentially hazardous shallow conditions or features include seismicity, subsurface faults, fault scarps, shallow gas, mud slides, steep-walled canyons and slopes, buried channels, current scour, migrating sedimentary bedforms, ice gouging, permafrost, gas hydrates, unstable soil conditions, pipelines, anchors, ordinance, shipwrecks, and other geological or man-made features.

This Notice to Lessees (NTL) provides guidance for shallow hazards geophysical surveys, evaluations, and reporting procedures for the Alaska OCS Region. It is issued to clarify and interpret requirements contained in regulations and does not impose additional requirements.

**General Guidelines**

Qualified and experienced personnel should perform the field survey, process and analyze data, prepare the report, and acknowledge responsibility by signing the appropriate data logs, analysis and reports. You are responsible for obtaining the best possible results using the most appropriate survey technology. Poor quality data due to acquisition or processing technique is not acceptable and could result in a resurvey.

If you have any questions, please contact Jeffrey Walker at (907) 271-6190 or [jeffrey.walker@mms.gov](mailto:jeffrey.walker@mms.gov).

  
FOR Acting RSFO

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Jeffrey Walker  
Regional Supervisor  
Field Operations Office

Feb. 7 2000  

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Date

You should conduct the activities described in this notice according to all applicable laws, regulations, rules, and lease stipulations, including the Marine Mammal Protection Act of 1972 as amended and the Endangered Species Act of 1973 as amended.

We are aware that seasonal constraints for operating in the arctic OCS often make timing for collection, processing, interpreting, and submitting data difficult. However, surveys need to be conducted and information provided to us for review sufficiently in advance of drilling, platform construction, or rig set-down operations.

In areas where data of adequate coverage and quality are available, we may modify or waive specific shallow hazards survey requirements on a case-by-case basis. We will consider new technologies, acquisition or processing techniques, and alternate survey designs. We strongly recommend that you review your proposed survey strategy with appropriate MMS personnel before starting any survey operations.

This NTL does not cover other ancillary activities such as archaeological, biological, and geotechnical investigations or pipeline surveys. Pipeline and archaeological survey and reporting guidance are contained the Pipeline Rights-of-Way (NTL 00-A02) and Archaeological (NTL 00-A03) Survey NTL's. However, we may allow the use of selected shallow hazards data to satisfy or supplement data requirements of an archaeological, biological, or pipeline survey if we determine that such a survey is necessary and that the data satisfies the requirements for that survey. You are encouraged to consult with us about the potential for using shallow hazards data to satisfy these provisions.

### **Notification**

You should notify other potentially affected OCS users before conducting this survey and you must satisfy any lease stipulations or mitigating measures in effect--in the Beaufort Sea this includes Lease Sale 170 stipulations and Information to Lessees notice regarding coordination with subsistence communities. You should notify us a minimum of 2 weeks before starting any survey operations. In addition, you or your contractor should notify us at least 72 hours before mobilizing this survey so that an MMS observer may make arrangements to be present.

### **Shallow Hazard Survey Requirements**

Shallow hazards data must provide information on sea floor conditions that may present hazards to rig set down, platform construction, or drilling operations. It must also provide information on sub-seafloor conditions that may pose a hazard to drilling or production activities.

You may meet shallow hazards survey requirements by a survey strategy that combines different systems. We will consider new technologies and survey strategies if they meet the minimum data requirements.

### **1) Program Design**

Shallow hazards surveys should provide detailed coverage along a grid series generally 300 by 1,200 m for exploration wells and closer for production platforms (depending on specific geologic conditions and/or proposals in the Development and Production Plan). You should provide coverage to a sufficient distance (usually 2,400 m) in all directions from the proposed location or lease block line or in all directions from the surface projection of a slant well bore or multiple slant wells. All lines should extend beyond intersections to ensure grid closure and subsurface ties.

### **2) Sea Floor Imagery**

Use side scan sonographs or sonograph mosaics of the sea floor that can identify areas of exposed rock outcrops, sea floor scarps, sedimentary textures, underwater obstacles, areas of potential biological activity, or archaeological resources. Recordings should be of optimal quality (good resolution, minimal distortion) resulting in displays automatically corrected for slant range, lay-back and vessel speed, and provide 150 percent coverage of the area to be affected by the proposed exploratory operations.

### **3) Bathymetry**

Fathometer data should consist of high frequency (12 kHz or higher) continuous sea floor profiles. In areas of complicated sea floor characteristics a multi-beam system may be needed.

### **4) Water-Column Anomaly Detection**

Use a system capable of detecting gas in the water column. Analog profiles of bathymetry are capable of detecting gas where it is present in the water-column. To obtain good records, this may involve using a higher bandpass frequency during water-column profiling than normally used to record only the sea floor return.

### **5) High-resolution seismic profiling systems**

Acoustic reflection profiling should continuously resolve geologic features over the survey area-- from the sea floor surface to a minimum depth beneath the sea floor, depending on specific geologic conditions or drilling proposals, of 1.0 to 1.5 seconds two-way travel time (800 to 1,000 m or 2,500 to 3,500 ft depending on sound velocity). Horizontal continuity and resolution should be achieved by rapid pulsing approximately every 20 feet (6 m) or less. Vertical resolution should be 1 millisecond (ms) or better immediately below the sea floor, and graduated to not more than 10 ms at maximum penetration depths. Vertical exaggeration should not exceed 10:1 on all geophysical records. Decouple and/or compensate the system for wave heave if you undertake operations in a sea state of greater than Beaufort Code 2. All seismic systems should be integrated with survey navigation resulting in accurate posting of fixed points on seismic lines.

Marine high-resolution geophysical profiling is generally accomplished with the four following systems, a combination of similar systems, or equivalent equipment that result in the required penetration and resolution:

- a. Multi-Channel system such as a sleeve exploder, air gun, water gun, sparker or equivalent system to provide penetration to 1.0 to 1.5 seconds two-way travel time with a vertical resolution of at least 10 ms. Data should be digitally processed to suppress water bottom multiples. Displays of both true relative amplitude and automatic gain will be necessary to successfully display and distinguish weak and strong reflections. Migrated displays may be needed on selected profiles in structurally complex areas. Appropriate velocity data should accompany digital displays;
- b. *Mini-sleeve exploder, air gun, water gun, sparker or equivalent system to provide penetration of 400 to 600 ms with resolution of 10 ms or less. Analog records of high quality may be accepted. This data may also be digitally processed to suppress water-bottom multiple reflection in shallow water depths;*
- c. Higher-frequency recording from mini-sleeve exploder, water gun, boomer, or non-reverberatory mini-sparker or equivalent system to provide resolution of 2 ms. Analog records or digital records with sufficient sampling density are acceptable;
- d. 3.5 or 7 kilohertz piezoelectric sediment profiler or equivalent system to penetrate soft sediments with a minimum vertical resolution of 1 ms.

You should exercise care in selecting (combining) and operating these systems to minimize pulse reverberation obscuring subsequent reflections, and to assure continuous optimal resolution throughout the depth range in spite of limitation of any one system.

Resolution of amplitude should be such that strong reflections are distinguishable from weak reflections. Digital records should employ a sampling rate that will result in high quality displays at full-scale.

## **6) Magnetometer**

If there is reason to suspect the presence man-made objects on the sea floor that may pose a hazard to operations, you may need to collect magnetometer data. Magnetometer survey techniques should be capable of detecting and aiding the identification of ferrous or ferric or other objects having a distinct magnetic signature. In deep water, depressed towing may be needed to achieve desired resolution and auxiliary recording of sensor depth or its height above the sea floor may also be needed. Sensitivity is normally 1 gamma. Noise level should not exceed  $\pm 3$  gammas.

## **7) Navigation**

You should use the best available technology for your navigational positioning system, with an accuracy of  $\pm 2$  m (6 feet). For marine surveys the vessel track should not vary more than  $\pm 15$  m (50 feet) from the pre-plot line, except to avoid obstructions. The navigation system should be integrated with seismic systems and posted on seismic records. All fix marks should be easily identified on post-plots. For marine deep-tow systems, an ultra short baseline system may be required in order to track the towfish within a 1 percent error margin and should be integrated with the ships navigation.

## **8) Shallow Core Data**

In cases where bottom-founded structures or gravel or ice islands will be used, you will need to collect shallow core data for the analysis of shallow hazards, engineering and geotechnical evaluations, and/or archaeological resources.

### **Data Preparation**

Submit paper copies of data in optimal quality and Z-folded with identification labels or headers exposed to facilitate ease of handling during interpretation. Annotate data records with fix marks at 100 m or other appropriate intervals and with all scale parameters and changes during recording including start and stop information and shot points. You should display paper records with consistent orientation; such as west to the left and north to the left. Annotate line crossings and corresponding shot-points on the records. Do not make interpretative markings on the data portion of the original records or copies you submit.

- a. One paper print of all profiles and recordings acquired.
- b. Tapes, disks, or CDs of raw and processed digital data.
- c. Original magnetometer records, when required.
- d. Side scan sonar records in paper copies. If copies are not of adequate quality to delineate sea bottom conditions, you may need to submit original records at the time of the application. Original records and copies of digital records should be available to us after data is submitted for site clearance.
- e. Digital navigation data of the survey area on tape, disk, or CD.

## **Survey Report Format and Content**

You are encouraged to submit your survey/evaluation report and data at least 30 days in advance of the Application for Permit to Drill (APD). If you submit the APD(s) without supporting hazards survey/evaluation information, or with data that we determine does not meet the survey requirements, we will deem it incomplete until you submit supporting information.

### **1) Narrative Report**

- a. Two copies of the summary narrative report discussing field and professional personnel, systems and instrumentation, operational procedures and conditions, field logs, interpretive techniques and results, general geologic conditions, shallow sedimentary environments, and specifically addressing the potential for shallow hazards and engineering considerations in the area of the proposed activity.
- b. Two copies each of two structural cross-sections passing at right angles through the proposed well-bore location, with interpretation.

### **2) Maps**

- a. One page-size geographic index map illustrating survey area(s) relative to geography, sale area, and indicating lease and block numbers associated with survey(s) in NAD-83.
- b. A digital graphic copy of postplot location map(s) constructed to state plane and appropriate zone UTM projection and illustrating track lines, fix points, and proposed and existing well location(s) relative to metric X-Y coordinates, geodetic coordinates, and lease block boundaries.
- c. Two paper prints of postplot location map(s), as above with the following illustrated thereon:
  - (1) Bathymetry contoured in intervals of 2 meters or less, or in a way not to impair legibility of the map if closely spaced, but sufficient to map shallow or seafloor features.
  - (2) Thickness and distribution of unconsolidated sediments, when present, contoured in intervals of 5 m or less, or in a way not to impair legibility of the map if closely spaced. The location, datum, soil classification, and graphic soil logs, to an appropriate scale, should also be shown.
  - (3) Shallow structure contoured at intervals of 20 m or less or in a way not to impair legibility of the map if closely spaced.

(4) Anomalies or potential hazards should be indicated on a base map with subsea depth to event posted.

d. For surveys clearing a site location, map scales should be of the order 1:10,000. For surveys clearing a lease block, prospect, or development location, map scales should be of the order 1:20,000, depending on the scope of the project.

f. To facilitate development of our regional database we request, for digitally produced maps above, that you to provide copies in Arc/Info Export file format as unprojected data in latitude, longitude, and decimal degrees.

### **Analyses Reports**

Two copies each of the results of all geological, geotechnical, and geochemical analyses acquired from any associated soil sampling programs, together with attendant graphic soil logs.

### **Deep Penetration Seismic Profiles and Survey Grids**

Provide at least two common depth point seismic lines intersecting at or near the primary well locations. These profiles may come from the prospect's seismic exploration survey and should provide resolution down to the full depth of the proposed drilling. You should also supply a survey grid map to allow accurate placement of the deep seismic lines in relation to other surveys and the proposed location. The map should clearly show navigation fixes, shotpoints, and line identifications for the submitted lines. You may use common depth point seismic lines furnished with an exploration plan according to 30 CFR 250.203 (b)(1)(ii) to satisfy this requirement.

### **Authority**

This notice is issued under the authority of the Code of Federal Regulations at 30 CFR 250.201 (Preliminary Activities); 30 CFR 250.203; (Exploration Plan); 30 CFR 250.204 (Development and Production Plans), and 30 CFR 250.414 (Application for Permit to Drill).

According to 30 CFR 250.196 (formerly 250.118), we may release to the public all high resolution seismic data 60 days after you submit it to us. This provision does not apply to exploration common depth point seismic data, which is held confidential.

**Paperwork Reduction Act of 1995 (PRA) Statement:** The collection of information referred to in this NTL is required in 30 CFR part 250, subparts B and D; and 30 CFR part 251. The Office of Management and Budget (OMB) approved the information collection requirements in these regulations and assigned OMB control numbers 1010-0049, 1010-0053, 1010-0048, respectively; and 1010-0044 for Form MMS-123, Application for Permit to Drill. This NTL does not impose additional information collection requirements subject to the PRA.