

**Investigation of Loss of Well Control  
Eugene Island Block 205, Well No. D-5  
OCS 0805  
28 May 2005**

Gulf of Mexico  
Off the Louisiana Coast

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David Dykes – Chair  
Jack Williams  
Frank Pausina

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## **Investigation and Report**

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### **Authority**

On 28 May 2005, the Pride Offshore Drilling, Inc. (hereinafter referred to as “Contractor” or “Pride”) jack-up rig *Pride Florida* (the “Rig”) was engaged in drilling operations for W&T Offshore, Inc. (the “Operator” or “W&T”) on Eugene Island (EI) Block 205 Well D-5 (the “Well”). While drilling at approximately 1,766 ft, an increase in flow caused the well to be placed on diverter and non-essential personnel to be evacuated. After flowing gas, mud, and sand through both diverter lines for 1½ hrs, the Well bridged at 0600 hrs. No sheen or pollution was observed. Pursuant to 43 U.S.C. 1348 (d)(1) and (2) and (f) [Outer Continental Shelf (OCS) Lands Act, as amended] and Department of the Interior Regulations 30 CFR 250, the Minerals Management Service (MMS) is required to investigate and prepare a public report of this accident. By memorandum dated 26 June 2006, the following personnel were named to the investigative panel:

David Dykes, Chairman – Office of Safety Management, GOM OCS Region;  
Jack Williams – Office of Safety Management, GOM OCS Region;  
Frank Pausina – Office of Safety Management, GOM OCS Region.

## Procedures

On the morning of 28 May 2005, personnel from the MMS visited the site of the incident to assess the situation. On 27 July 2005, representatives of the Operator met with members of the Panel in the Operator's office in Metairie to review the incident. Other information was gathered at various times from a variety of sources. This information included the following reports and statements:

- Daily Drilling Reports, 25 May 2005 - 30 May 2005, for Well D-5;
- Drilling Reports for Well F-7;
- Operator's Drilling Plan, Well No. D-5;
- Operator's Application for Permit to Drill, Well No. D-5
- Logging and drilling records for all wells drilled from the "D" and "F" platforms;
- A summary of the casing records for all wells drilled from the "D" and "F" platforms and the satellite wells EI 206 #2 and #3;
- Interviews with drilling management, engineering, and geologic personnel of the Operator.

## **Introduction**

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### **Background**

The surface location for Well D-5 is within Lease OCS 0805, which covers approximately 5,000 acres and is located in Eugene Island Block 205 (EI 205) Gulf of Mexico, offshore Louisiana (*for lease location, see Attachment 1*). The Lease OCS 0805 was issued to Texaco, Inc. and Pan American Petroleum Corp., effective May 1960, with Texaco acting as the operator. In May 1988, the lease was sold and it subsequently passed through a series of ownership consortiums and operators. At the time of the incident and currently, the lease is owned 100 percent by W & T Offshore, who also is the operator of record.

In 1973, following the successful drilling of the EI-205, D-1 well, the three-pile, four-slot “D” Platform was set. Subsequently, four additional wells, including the D-2, D-3, D-3 ST, and D-4, were drilled from the Platform. In 2005, an additional well, the D-5, was planned for the Platform. The MMS approved the drilling of the Well on 11 May 2005.

### **Brief Description, Loss of Well Control**

The Well was spudded on 25 May 2005, and conductor casing was set at approximately 1,000 ft. While directionally drilling at approximately 1,766 ft measured depth (MD), the bit encountered something “hard.” After drilling continued ahead for approximately 6 ft, flow was observed. The flow increased rapidly and the well stream was put into the diverter. Non-essential crew members were evacuated within about 15 minutes of first flow into the diverter.

After the Well flowed gas, sand, and water through the diverter for approximately 1½ hrs, the Well bridged over. Normal well control operations were then initiated by Operator and Rig personnel and the Well was secured. No pollution and no injuries were reported.

## **Findings**

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### **Preliminary Activities – Preparation of the Well Plan**

The EI 205 “D” Platform of the EI 218 Field stands in 108 ft of water. The three-legged, four-slot Platform was set in 1973 and five wells were drilled from the surface location of the Platform by the original operator, Texaco. Production was initiated from the Platform in 1973.

In 2005, the Operator planned the addition of a new well, the D-5, to be drilled from the “D” Platform. According to testimony, the D-5 Well was permitted after a review of the shallow gas hazards in the area by using available seismic and logs from all of the nearby wells, and a review of the drilling history of all wells previously drilled in the immediate vicinity.

The well plan for the D-5 included setting a string of conductor casing, though such casing had not been used in any of the other wells from the “D” or “F” platforms excepting the initial D-1 well. Testimony was received indicating that the setting of a string of conductor casing in the Well was a precaution prompted by the presence of shallow gas in more remote areas of the EI 218 Field, and the relative age of the sparker survey and shallow gas seismic information.

### **Drilling Activities — Spud, Loss of Control, Regain Control**

(From drilling morning reports and interviews)

**26 May** – The crew ran and set 16-inch conductor casing.

**27 May** – The cement and float equipment for the 16-inch casing was drilled out, the well was kicked off directionally, and drilled to 1,766 ft MD.

**28 May – 0430-hrs:** While directionally drilling ahead, the bit encountered something “hard” at approximately 1,766 ft MD. An attempt was made to drill past the hard spot. When drilling reached 1,772 ft, an increase in flow was observed. The diverter lines were opened and the

annular preventer was closed, putting the well on diverter with pumps running. All non-essential personnel were evacuated to the workboat *Mariner Tide* at 0445 hrs.

**0600-hrs:** The well bridged over and, subsequently, the drill string was found to be stuck at approximately 1,762 ft. Normal well kill-and-secure operations were initiated.

**28-31 May** – The Well was monitored while the diverters and blowout preventers (BOP's) were tested. An attempt was made to recover the stuck drill pipe. The attempt to fish the well clear failed and, upon receiving permission from MMS, the Well was subsequently plugged back to 1,200 ft according to the procedure approved by MMS. Preparations were then begun to bypass the obstruction and complete the well in the intended zone.

### **Previous Surface Hole Operations in the Immediate Area**

According to testimony, no indication of the presence of shallow gas was indicated by the geologic review or by review of previous drilling operations from either the “D” Platform or “F” Platform, or from caisson wells in the area.

Within Block 205, two platforms, the “D” and “F,” are set in close proximity, within 80 ft of each other, connected by a bridge (*see Attachment 2*). A total of 13 wells have been drilled from these two platforms to date.

The “D” platform was set and brought on production in 1973, three years after field production had begun. Prior to the spud of the D-5 Well, five wells had previously been drilled from the “D” Platform, the D-1, D-2, D-3, D-3ST, and D-4. Except for the first well, the D-1, all of the subsequent wells (except the D-5) had been permitted and drilled without setting a string of conductor casing. None reported operational or drilling problems with shallow gas.

According to testimony from the Operator and MMS personnel, the first well drilled at a prospective platform site is often logged as shallow as possible, usually to the depth of the drive pipe. However, none of the wells drilled from the “D” platform location, including the D-1, were logged to a depth shallower than approximately 2,000 ft.



The “F” Platform was set 80 ft from the “D” platform in 1976 and bridge-connected to the “D” Platform. Eight wells were subsequently permitted and seven wells were drilled from the “F” platform. None of the “F” platform wells was permitted or drilled using conductor casing. According to testimony from the Operator and MMS personnel, this omission of conductor casing is an indication that the Operator has confidence in the absence of shallow gas deposits and has demonstrated that confidence in the permitting process.

### **Drilling Procedures and Kick Control**

No indications were found that improper drilling or kick control procedures were employed by the Operator or Contractor during this event. The drilling bit was reported to have encountered something “hard” at 1,766 ft MD. The kick occurred with a sudden increase in flow shortly after attempting to drill past the “hard” object.

No information was available indicating whether the “hard” object encountered at 1,766 ft MD was associated (or not associated) with the kick and/or the loss of control. No indication was available indicating that the “hard” object was a cultural feature. At the depth where the drill bit encountered the hard spot, only two previously drilled wells were within 240 ft of the D-5 wellbore. The previously drilled D-3 Well was plugged and abandoned as a dry hole (it was later sidetracked), leaving casing set shallower than 1,772 ft MD. From the directional surveys, drilling operations on the Well encountered the hard spot over 200 ft away from the surveyed position of the casing of the D-3 well at that depth.

The F-7 Well had also been previously drilled and placed on production. The surveys of the F-7 and D-5 wells indicate that, at the measured depth of the D-5 when the hard spot was encountered, the casing for the F-7 well was approximately 170 ft removed.

From testimony, the onset of the kick that led to the loss of control of the D-5 Well into the diverter system was too rapid to control. With only conductor casing set, procedures approved by the MMS required flow be placed into the diverter system.

## **Geologic Review of Shallow Gas**

Through-tubing/casing logs were run inside the stuck drill pipe of the D-5 Well prior to its being bypassed. Testimony indicates that the through-tubing logs were inconclusive. However, the Operator thinks that the top of the zone that was possibly the source of the shallow gas kick is located at approximately 1,766 ft MD.

The seismic surveys and sparker survey data that were reviewed in preparing the well plan for the Well were older data shot before the installation of field infrastructure. The infrastructure included the “D” Platform and the nearby “F” platform and the associated wells, gathering lines, and pipelines. According to testimony, the Operator’s geologists and geophysicists found no indication of the presence of shallow gas during the review of the old seismic data and/or sparker surveys.

According to testimony and confirmed by MMS records, no wells drilled in the immediate vicinity of the D-5 were logged to surface. Only the D-3 ST well, drilled in 1995, was logged to a depth as shallow as approximately 2,000 ft. All other wells from the “D” and “F” Platforms, and two satellite wells in the area, were logged beginning at a depth deeper than 3,000 ft MD. Thus, no log information from wells in the immediate vicinity indicated the possible presence of shallow gas pockets.

As per discussions with MMS geologic personnel, in older, heavily drilled gas fields in the Gulf of Mexico, it is not uncommon to find that gas from a deeper zone migrates via natural or man-made conduits into a shallower, lower pressured zone during the life of the field.

Current policy is that MMS reviews the shallow gas hazard potential of only the initial well drilled from a common surface location. As a result, the shallow gas hazard portion of the well plan for the EI-205, Well D-5, was not formally reviewed by the regulatory agency.

## **Conclusions**

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### **Causes**

It is the conclusion of this panel that the loss of control and diverter incident was caused by an influx of gas from an unidentified pressurized zone. This conclusion is based on the facts that none of the other wells previously drilled in the general vicinity had encountered shallow gas, and no logs from the other wells were available at the depth the gas zone was encountered; and that the existing seismic information did not indicate the presence of shallow gas.

The panel has been unable to identify the “hard” object that was encountered at approximately 1,766 ft MD; however, the panel concludes that the top of the pressurized zone is located at 1,766 ft MD.

### **Contributing Causes**

The unidentified pressurized zone may have been caused by the migration of gas from one of the previously drilled reservoirs into the originally under-pressured zone; or it may have been a localized pocket of gas that would not have been seen in any of the previous seismic information.

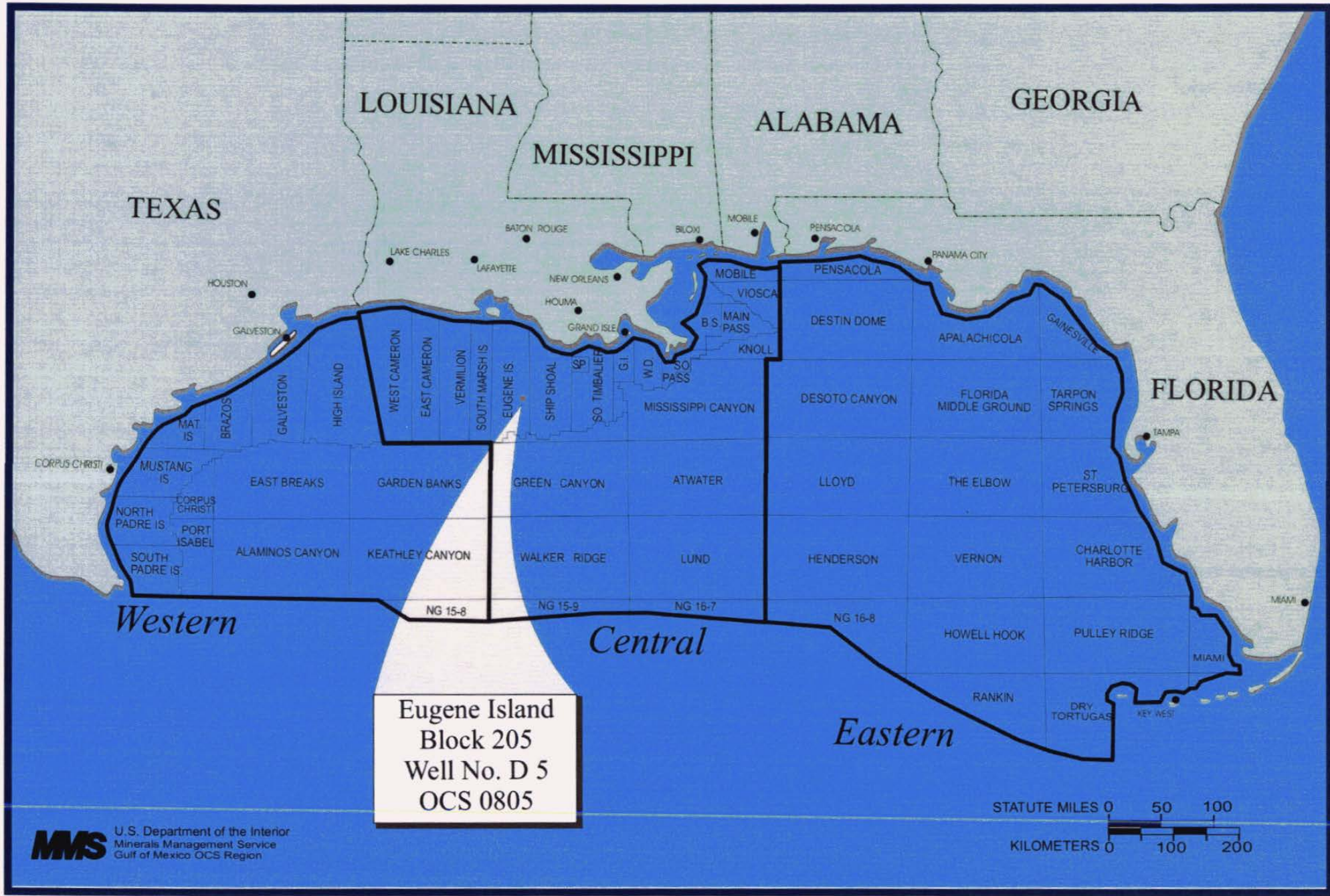
### **Possible Contributing Causes**

Based on the conclusions above, a possible contributing cause of this incident is the absence of both regulatory requirements and standard industry practice requiring updated shallow hazards surveys for new wells being drilled from previously drilled locations.

## **Recommendations**

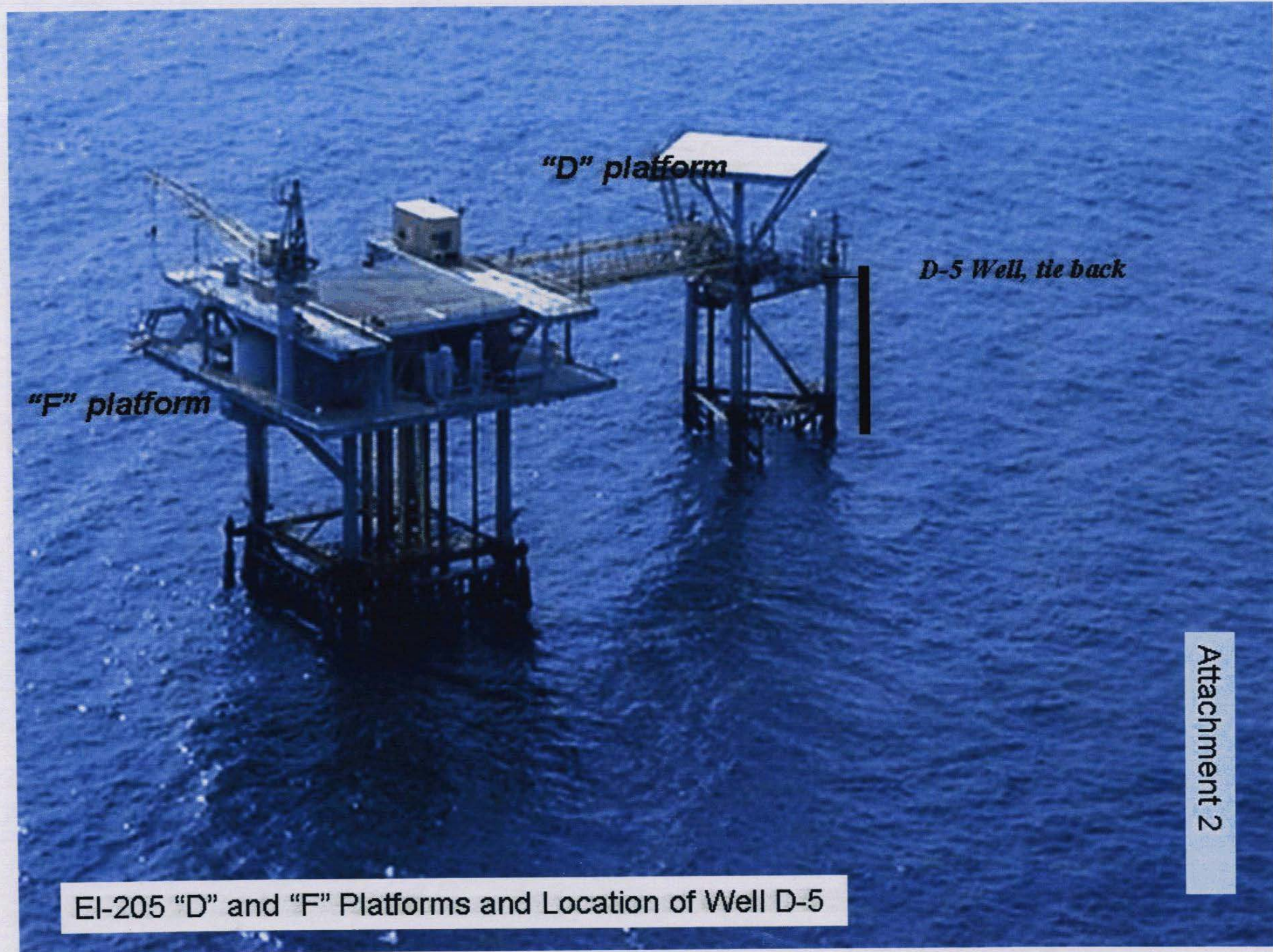
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It is recommended that MMS consider studying the feasibility of requiring a geologic and/or geophysical review, including new and/or updated seismic information from previously drilled locations, for the identification of possible shallow gas hazards before permitting new wells.



Location of Lease OCS 0805, Eugene Island Block 205, Well No. D 5.





*"D" platform*

*"F" platform*

*D-5 Well, tie back*

EI-205 "D" and "F" Platforms and Location of Well D-5