

STATE OF WEST VIRGINIA  
PERFORMANCE AUDIT  
OF THE  
**DIVISION OF ENVIRONMENTAL  
PROTECTION**

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Orphan Gas and Oil Wells are a Threat to  
Health, Safety, and Economic  
Development

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Performance Evaluation & Research Division  
Building 5, Room 751  
State Capitol Complex

CHARLESTON, WEST VIRGINIA 25305  
(304) 347-4890

PE95-19-40

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January 1996

**WEST VIRGINIA LEGISLATURE**  
*Performance Evaluation and Research Division*

**Building 5, Room 751A**  
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**Antonio E. Jones, Ph.D.**  
**Director**

January 6, 1996

The Honorable A. Keith Wagner  
State Senate  
Box 446  
Iaeger, West Virginia 24844

The Honorable Joe Martin  
House of Delegates  
Building 1, Room 213E  
1900 Kanawha Blvd. East  
Charleston, West Virginia 25305

Gentlemen:

Pursuant to the West Virginia Sunset Law, we are transmitting this Performance Audit of the Office of Gas and Oil within the Division of Environmental Protection, which will be reported to the Joint Committee on Government Operations on Saturday, January 6, 1996. The issue covered herein is "Orphan Gas and Oil Wells are a Threat to Health, Safety, and Economic Development."

Sincerely,

A handwritten signature in black ink, appearing to read "Antonio E. Jones".

Antonio E. Jones

AEJ/wsc

Enclosure



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## EXECUTIVE SUMMARY

### **ISSUE AREA 4: ORPHAN GAS AND OIL WELLS ARE A THREAT TO THE HEALTH, SAFETY, AND ECONOMIC DEVELOPMENT OF THE STATE OF WEST VIRGINIA AND ITS CITIZENS**

The review focused on the Abandoned Well Plugging and Reclamation Program within the Office of Oil and Gas. The Program is responsible for classifying abandoned wells based on risk, inventorying them and plugging them. In 1990, the Office contracted a study by the West Virginia Geological and Economic Survey (WVGES) to identify the threat posed by abandoned wells. The survey identified 50,992 wells, of which an estimated 13,258 are abandoned and need to be plugged.

Since FY 1986, the Office has averaged the plugging of 11 wells per year, and at that rate, **it will take the Office 1,205 years to plug all the abandoned wells identified by the WVGES.** The Office's limited funds do not allow for additional plugging. Abandoned wells can potentially cause a threat to groundwater contamination and be a possible explosive and fire hazard. Also, unplugged wells can be considered a hindrance to economic development.





## Office of Oil and Gas

### Mission and Background

The Office of Oil and Gas within the Division of Environmental Protection, is the environmental regulatory agency responsible for regulating oil and gas production and transportation. The office issues permits for coalbed methane wells and provides for the plugging and reclamation of abandoned wells. There are three programs within the Office: Oil and Gas Field Operations; Oil and Gas Technical Support; and Oil and Gas Abandoned Well Plugging and Reclamation. The office has a staff of 26 employees, 13 of which are field inspectors working from their homes within the four districts throughout the state. This review focuses specifically on the Oil and Gas Abandoned Well Plugging and Reclamation Program.

### **Oil and Gas Abandoned Well Plugging and Reclamation Program.**

The Oil and Gas Abandoned Well Plugging and Reclamation Program's mission is to classify abandoned wells based on risk, to identify them and plug them. According to the *West Virginia Code*, §22-6-19 an abandoned well is:

"any well which is completed as a dry hole or which is not in use for a period of twelve consecutive months shall be presumed to have been abandoned and shall promptly be plugged by the operator in accordance with the provisions of this article, unless the operator furnishes satisfactory proof to the director (DEP) that there is a bona fide future use for such well."

The code specifies that a well operator is responsible for plugging or filling each well owned, following abandonment. The abandoned well program is designed to protect the public from the dangers of wells whose owners did not plug them or who plugged the wells improperly.



**ISSUE 4: ORPHAN GAS AND OIL WELLS ARE A THREAT TO THE HEALTH, SAFETY, AND ECONOMIC DEVELOPMENT OF THE STATE OF WEST VIRGINIA AND ITS CITIZENS.**

Since 1978, the office has been responsible for plugging orphan wells, which are abandoned wells in which no owner can be found. Wells are plugged by statewide contractors that must go through a bidding process. The office has averaged plugging approximately 11 wells per year since 1986. In Fiscal Year 1994, the average cost for plugging a well was \$20,000.

The Office of Oil and Gas has developed a scoresheet for abandoned oil wells which assists in prioritizing which wells are to be plugged first. Following is the priority definitions along with Table 12 which illustrates the classification system:

- Priority I: Imminent danger to people or resource development  
(More than 50 points total)
- Priority II: No imminent danger to people or resource development  
(Greater than 25 points but less than 50 points)
- Priority III: Defer to Higher Priorities  
(Less than 25 points)

<b>TABLE 12 Abandoned Well Classification System</b>	
<b>Condition</b>	<b>Points</b>
Contaminating groundwater	60
Leaking gas, oil, or saltwater at surface	55
Impediment to mineral development	50
Lack of future use potential	25
Absence of freshwater casing	10
Absence of production casing	10
Within 100 ft. of lake, river, or creek	10
Within 200 ft. of drinking water supply	10
Within 200 ft. of dwelling or public building	10
Greater than 25 years old	10
Presence of contaminated soil around wellhead	10
Junk on location	10

Source: Office of Oil and Gas

Priority I wells are the first series of wells that are to be plugged. Potentially, over a period of time, the Priority III level wells can develop into a Priority II well, and a Priority II well can eventually turn into a Priority I well. Abandoned wells can potentially cause a threat to groundwater contamination, and become a possible explosive and fire hazard. Also, unplugged wells can be considered a hindrance to economic development. Recent examples include Stonewall Jackson Lake, and the building of a grocery store in Putnam County. One coal company spends on average of \$3 million per year to plug abandoned wells. Office of Oil and Gas staff have indicated that collectively the abandoned wells could present a significant problem since liability of plugging the wells rests with the state, but according to a letter which is located in Appendix A, the director of DEP states that the Office has

"no way of assessing the collective risk to human health, or West Virginia's economy from abandoned wells."

While the actual risk cannot be determined, Appendix B shows the eight wells that were plugged by the Office in FY 1995, and the threat that the well was posing to the environment.

### **Geological Economic Survey Study**

In July of 1990, the Office of Oil and Gas contracted a study by the West Virginia Geological and Economic Survey to identify the threat posed by abandoned wells. The wells must have met the following three criteria: no production reported since 1984; no affidavit on file showing total plugging; and not identified as a storage well, secondary recovery well, etc. in the WVGES Oil and Gas Data System. The survey, completed in May of 1995, identified more than 50,000 natural gas and oil wells that met these three criteria. A preliminary state map of abandoned oil and gas wells is located in Appendix C. From that 50,000, the office took a random sampling of 150 of the wells and attempted to locate and identify them. Approximately 45% of the wells could not be found. The table below illustrates the status of the 50,992 wells according to the random sample:

<b>TABLE 13</b> <b>Estimated Number and Status of Abandoned Wells</b>		
<b>Status</b>	<b>Percentage</b>	<b>Estimated Total Number</b>
Can't be found	45%	22,946
Abandoned:	26%	13,258
Priority I	37%	4,905
Priority II	57%	7,557
Priority III	6%	795
Plugged	15%	7,649
Producing	15%	7,649
Don't know	2%	1,020

Source: WVGES

## Causes

The state has placed a liability on itself to plug wells that have been abandoned and have no identified owner. The WVGES survey identified 50,992 wells through its five year study. Approximately 13,258 are considered to be abandoned and need to be plugged, which at the average rate of 11 per year since 1986 will take 1,205 years. This new figure adds a substantial amount of wells that need to be plugged. The Legislature has established an Oil and Gas Reclamation Trust fund for the reclamation and plugging of abandoned wells. The FY 1996 appropriation for the fund was \$465,000. The fund receives revenues from a fee on each operator applying for a permit. The operator must pay a \$100 reclamation fee. Also any forfeited bonds are deposited into the funds. Bonds can range from \$5,000 for a single well, or a \$50,000 blanket bond for multiple wells. This leaves a limited amount of funds to be set aside for plugging and reclamation of wells.

## Conclusion

As many as 13,258 gas and oil wells remain unplugged, and though the risk cannot be measured they potentially could pose a danger to human life and economic development. The

overall effect the office is having on abandoned wells is limited. From a list provided by the Office of Oil and Gas, of the 300 abandoned wells with the highest classification, 119 are those with scores of 50 or higher, which classifies as a Priority I well. Forty-eight of these have a score of 100 or more with the highest being 225. The highest possible total is 270. Of that group, 28 have an unknown operator. Of the 119 wells that have been identified as Priority I wells, at the average rate of 11 wells a year since FY 86, the process of plugging these wells would take approximately 11 years. This figure does not include the wells identified by the WVGES study. Using the estimates from the sample, a possible 4,905 could be classified as Priority I abandoned wells. At the current plugging rate, the plugging of these wells would take approximately 446 years. Adding in the total number of wells that are abandoned and classified as Priority I, II, or III, the figure rises to 1,205 years to plug all the wells at the current rate. The current reclamation fee of \$100 does not allow the Office to maintain the funds that would allow them to plug an additional number of wells. With additional funding, the Office's goal is to begin plugging a minimum of 100 wells per year costing an estimated \$2 million. The additional funding would allow the Office to plug the 119 wells from the highest classification list in a little over a year, and a more realistic 49 years to plug the 4,905 Priority I wells identified by the WVGES study.

**RECOMMENDATION 3:**

*The Legislature should consider any funding requests by the Office of Oil and Gas in dealing with the problem of orphan gas and oil wells.*

## **APPENDIX A**







DIVISION OF ENVIRONMENTAL PROTECTION

GASTON CAPERTON  
GOVERNOR

10 McJunkin Road  
Nitro, WV 25143-2506

LAIDLEY ELI MCCOY, PH.D.  
DIRECTOR

DEP/OO&G-1328

December 20, 1995

Mr. David Ellis  
Research Manager West Virginia Legislature  
Performance Evaluation and Research Division  
Building 5 Room 751A  
1900 Kanawha Boulevard, East  
Charleston, WV 25305-0592

Dear Mr. Ellis:


Thank you for the opportunity to comment on abandoned wells and their effect on West Virginia. I have included a report that outlines the magnitude of the abandoned well problem in West Virginia. We estimate in today's dollars that in order to plug and reclaim these wells, it would take \$92,000,000.

We have no way of assessing the collective risk to human health, or West Virginia's economy from abandoned wells. You can see by the list of the eight wells we plugged this year that they were a threat to human health or the environment. In addition, because we do not have the resources to plug wells in a timely manner, individual companies plug wells using their own resources so that they can proceed with the development of their property. One coal company in West Virginia, spends on average, \$3,000,000 per year to plug abandoned wells.

I believe that the solution to the problem in West Virginia has two components, restoration and prevention. We will be offering a bill this legislative session to ask for additional resources to restore or as the term in the oil and gas industry to plug about 100 wells a year. In the prevention front, I believe we need to increase our resources for our Office of Oil and Gas. This will provide them with the tools to ensure that operators do not abandon wells to the state. This includes our request for capital improvements for database improvement, and increase in our inspection levels so that we could catch wells as they become at risk to be abandoned. These three items together would go a long way to ensuring a solution to this problem.

If you have any more detailed questions concerning abandoned wells please feel free to contact our Office of Oil and Gas, through its Chief Ted Streit, at 759-0514.

Sincerely,



Laidley Eli McCoy - Director

enclosures: Report of Abandoned Wells - 1995  
List of wells plugged 1995



## **APPENDIX B**



Wells Plugged - 1995

File Number	County	Farm	Situation / Consequence
47-105-01313	Wirt	Carpenter	Oil was contaminating a tributary of Reedy Creek. / Contamination terminated
47-013-00636	Calhoun	McCumbers	Landowner discovered oil flowing to the surface while plowing his garden. A stream was within a few tens of feet away. / Flow terminated
47-087-01504	Roane	Caldwell	Saltwater was flowing to the surface in the landowners' backyard. Groundwater was also contaminated. / Flow terminated
47-015-02525	Clay	Samples	Oil had contaminated two water wells. Oil was standing in the open wellbore about 20' from the surface. / Source stopped
47-085-02065	Ritchie	Bennett	Oil was flowing to the surface and contaminating the soil. / Flow terminated
47-105-01315	Wirt	Epling	Oil was flowing to the surface and contaminating the groundwater. / Flow terminated
47-017-04198	Doddridge	Underwood	Gas was contaminating the groundwater and had infiltrated the basement of the surface owners house. / Remediated
47-061-00120	Monongalia	Johnson/Hall	Gas was flowing to the surface from the well located only 2-3 feet away from landowners home. / Flow terminated



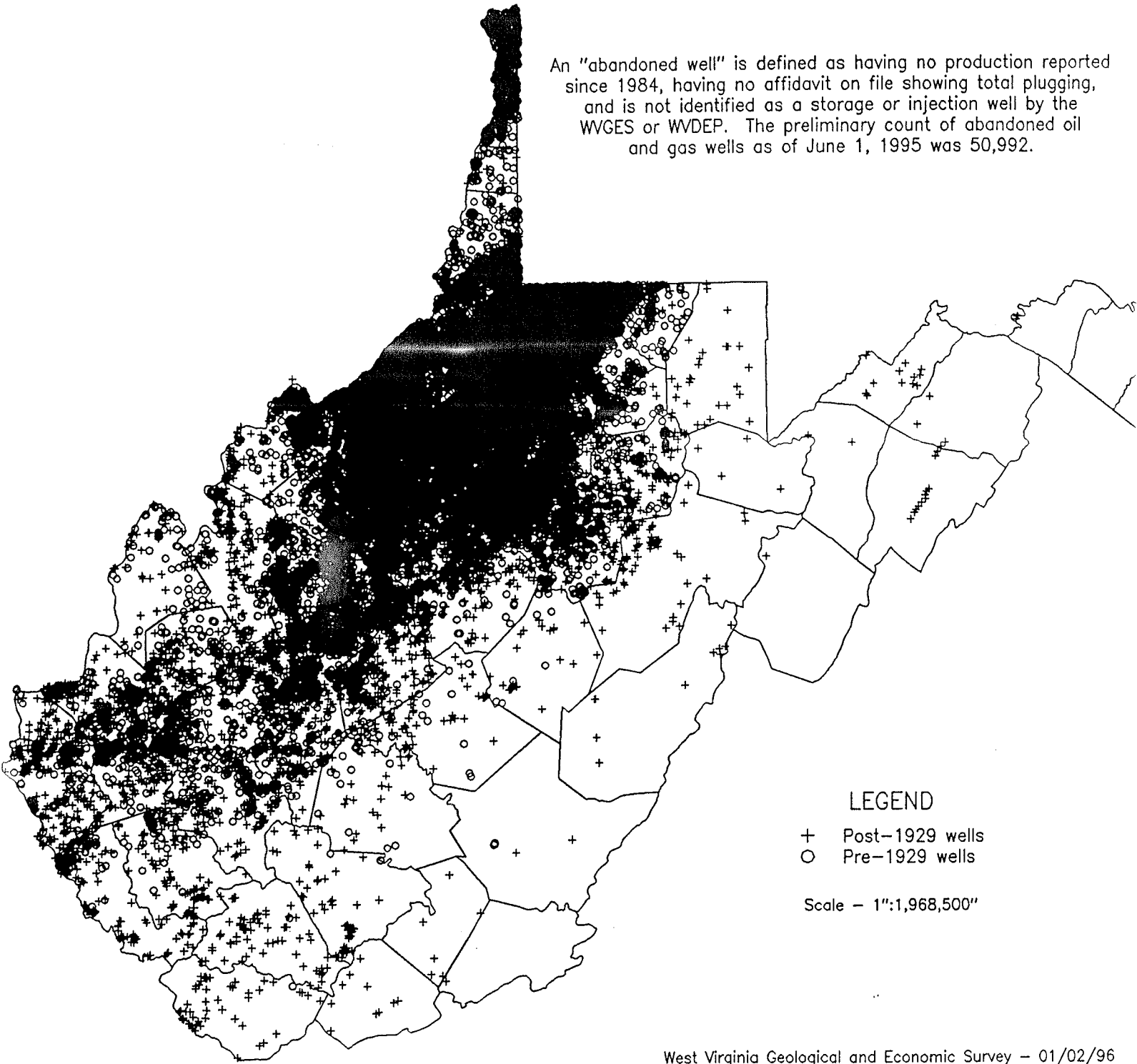
## APPENDIX C





# PRELIMINARY MAP OF ABANDONED OIL AND GAS WELLS IN WEST VIRGINIA

An "abandoned well" is defined as having no production reported since 1984, having no affidavit on file showing total plugging, and is not identified as a storage or injection well by the WGES or WVDEP. The preliminary count of abandoned oil and gas wells as of June 1, 1995 was 50,992.



## LEGEND

- + Post-1929 wells
- Pre-1929 wells

Scale - 1":1,968,500"

West Virginia Geological and Economic Survey - 01/02/96



**APPENDIX D**





**DIVISION OF ENVIRONMENTAL PROTECTION**

GASTON CAPERTON  
GOVERNOR

10 McJunkin Road  
Nitro, WV 25143-2506  
Telephone 304-759-0514

ELI McCOY  
DIRECTOR

DEP/OO&G-1329

January 2, 1996

Mr. Antonio E. Jones  
Director - Performance Evaluation and Research Division  
West Virginia Legislature  
Building 5, Room 751A  
1900 Kanawha Boulevard, East  
Charleston, WV 25305-0592

Dear Mr. Jones:

Thank you for the opportunity to comment on your draft copy of the performance review of our Office of Oil and Gas.

I have enclosed a correction sheet that changes the definitions and names of the abandoned well classification system, that is closer to the statute, (see §22-10-6). We have also tried to update the numbers for the report. The corrections use strikethrough to remove language and underline for new language.

If you have any more detailed questions concerning the corrections, please feel free to contact our Office of Oil and Gas at 759-0514.

Sincerely,

Laidley Eli McCoy  
Director

attachment: Corrections

**RECEIVED**

JAN 4 1996

RESEARCH AND PERFORMANCE  
EVALUATION DIVISION

## Corrections to Performance Audit of the Division of Environmental Protection

Orphan Gas and Oil Wells are a Threat to Health Safety and Economic Development.

Location	Corrections	
Cover Page	Division of Environmental Protection	
Page 3 first line	The Office of Oil and Gas within the Division of Environmental Protection, is the regulatory agency responsible for regulating <u>the</u> oil and gas production and transportation <u>industry</u> . The Office <u>also</u> .....	
Page 3 line 7	....working from their homes within the four districts ....	
Page 3 line 11	The Oil and Gas Abandoned Well Plugging and Reclamation Program's mission is to <u>identify, classify</u> abandoned wells, <u>classify them</u> based on risk, and plug them.	
Page 5 Para 2, line 2	.... first. <u>The Office plans to review this scoring procedure in 1996 to insure it places wells in their proper classes</u> .....	
Page 5 Para 2, line 3	.... which illustrates the <u>present</u> classification system:	
Priority Table	Change the Priorities to Class, i.e. <u>Priority-I Class I</u>	
<u>Class I</u>	<u>Immediate threat to people, the environment, or resource development</u>	
<u>Class II</u>	<u>Not an imminent threat to people, the environment, or resource development.</u>	
<u>Class III</u>	<u>Wells that may be deferred for an indefinite period.</u>	
Page 6	Change the Priorities to Class, i.e. <u>Priority-I Class I</u>	
Table 13		
Status	Percentage	Estimated Total Number
Cant' be Found	45 <del>42</del> %	22,945 <del>21,417</del>
Abandoned	26%	13,528
<u>Class Priority I</u>	37%	4,905
<u>Class Priority-II</u>	57%	7,557
<u>Class Priority-III</u>	6%	795
Plugged	45 <del>16</del> %	7,649 <del>8,159</del>
Producing	15%	
<u>Never Drilled</u>	2%	
<u>Don't know</u>		

## Corrections to Performance Audit of the Division of Environmental Protection

Orphan Gas and Oil Wells are a Threat to Health Safety and Economic Development.

Location	Corrections
Page 6 Para 1, last line	..... reclamation of wells. <u>Present balance in the reclamation and plugging account is approximately \$15,000</u>
Page 8 line 1	The overall effect the office is having on <u>plugging</u> abandoned wells is limited.
Page 8 line 2	....by the Office of Oil and Gas, of the <del>300</del> <u>200</u> abandoned wells <u>that have been inspected with the highest classification</u> , 119 are those with scores of 50 or higher which <del>classifies</del> <u>identifies</u> them as a Priority <u>Class I</u> well.
Page 8 line 5	<del>Of the group, 28 have an unknown operator.</del>
Page 8 line 6	...been identified as <u>Class</u> Priority I wells.
Page 8 line 7	.... This figure does not include the wells identified .....
Page 8 line 9	..... possible 4,905 could be <del>classified as</del> Priority <u>Class I</u> abandoned wells.
Page 8 line 11	... wells that are abandoned and are <u>a</u> <del>Class</del> <u>classified as a</u> Priority I, II, or III well, ...