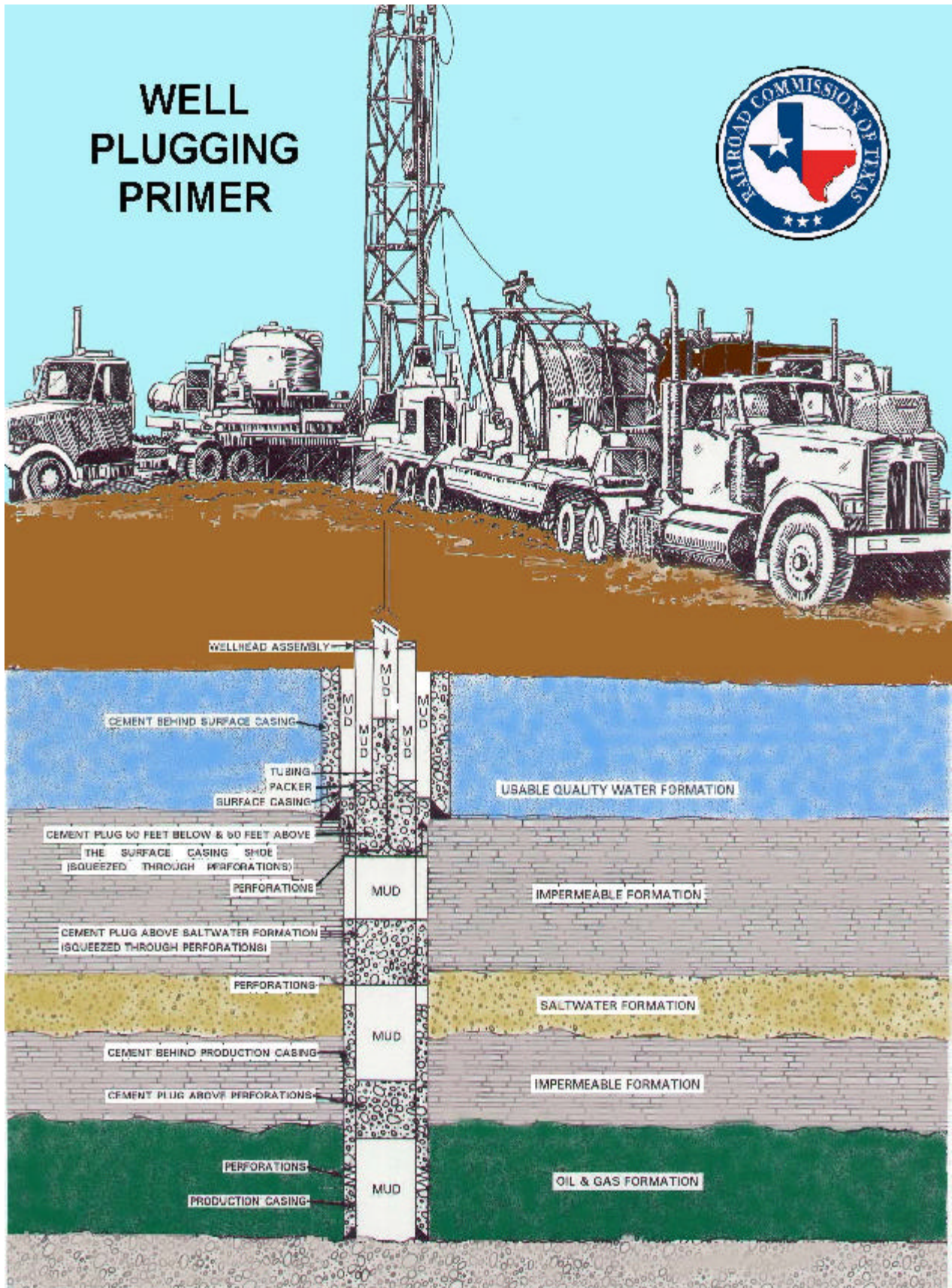


WELL PLUGGING PRIMER



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RAILROAD COMMISSION OF TEXAS

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Oil and Gas Well Plugging In Texas

1.0 Introduction

The Texas Railroad Commission (RRC) has long been active in regulating the exploration, development and production of oil and gas in the State of Texas, which includes protecting the environment and maintaining public safety. The RRC began regulating oil and gas exploration and production operations in 1919 and over time has adopted increasingly stringent plugging standards and procedures. Statutes to prevent pollution from unplugged wells also have been modified over the years to increase Commission authority in this area.

The RRC has utilized the Oil Field Cleanup (OFCU) Fund to plug more than 15,000 wells. However, thousands of additional abandoned wells remain. To ensure effective and efficient use of the OFCU Fund, the Commission has implemented a well plugging priority system to plug the wells that pose the greatest risk to the environment.

A recent grant from the Environmental Protection Agency (EPA) and the Texas Natural Resource Conservation Commission (TNRCC) and a cooperative agreement with the Texas General Land Office (GLO), will enable the RRC to properly plug over 171 abandoned wells on land and a yet-to-be-determined number of bay and offshore wells. These new funding initiatives are extremely important since there are insufficient funds in the OFCU Fund to plug all the abandoned wells in a reasonable period of time.

2.0 Definitions

Statewide Rule 14(b)(2): the Commission rule requiring that plugging operations on

each inactive well commence within one year after operations have ceased.

Inactive well: a compliant or non-compliant well that is not actively producing, injecting, or disposing.

Producing well: an active well that produces oil or gas.

Injection well: an active well used for gas (air, CO₂, etc.) or fluid (water, chemical, etc.) injection into a productive formation.

Disposal well: an active well used to dispose oil and gas waste into a non-productive formation.

Miscellaneous well: an active well used for observation, monitoring, water supply, etc.

Shut-in well: a compliant or non-compliant inactive well.

Shut-in 14(b)(2) well: a compliant inactive well with a valid 14(b)(2) plugging extension.

Compliant well: a well that is actively producing, actively used for injection or disposal, or has a valid Statewide Rule 14(b)(2) plugging extension.

Non-compliant well: a well that has been shut-in for a period in excess of twelve (12) months, has not been plugged, and does not have a valid Statewide Rule 14(b)(2) extension.

Statewide Rule 14(b)(2) extension: an administratively granted extension of time of one year to plug a well can be granted, if: the well is in compliance with all other laws and Commission rules; the well and associated facilities are not a pollution hazard; the

operator's organization report is current and active; and the operator has, and upon request, provides evidence of a good faith claim to operate the well.

3.0 Oil and Gas Well Distribution

At the end of August 1999, there were approximately **277,200** oil and **77,500** gas wells on the Commission's proration schedule for a total of **354,700** wells. These well counts include producing wells, shut-in wells, injection wells, disposal wells, and miscellaneous wells.

Included in the **354,700** wells are approximately **97,800** shut-in wells. These wells can be split into three groups that are defined as follows:

1. **59,800** wells are shut-in and have a valid 14(b)(2) plugging extension, which allows an operator to postpone plugging operations for a period of twelve (12) months.
2. **12,300** wells have been shut-in for a period of less than twelve (12) months and are considered compliant wells under Statewide Rule 14.
3. **25,700** wells have been shut-in for a period in excess of twelve (12) months, have not been plugged, and do not have a valid 14(b)(2) plugging extension. These non-compliant wells may be eligible for plugging through the OFCU Fund if the responsible operators do not place the wells into compliance with Commission rules.

The estimated cost to properly plug these 25,700 wells likely would exceed \$115 million, based upon an average plugging cost of \$4,500 per well.

The large number of shut-in, non-compliant wells poses pollution and economic concerns to the Commission. For example:

1. Unplugged wellbores pose a threat of pollution to surface and subsurface waters by providing a pathway for the migration of fluids (in particular oil and saltwater) from hydrocarbon bearing zones into formations containing usable quality water and onto surface waters. As long as a well remains unplugged, the potential threat remains until it is eliminated by properly plugging the wellbore.
2. Unplugged wellbores also pose a potential threat to hydrocarbon reserves. In areas where the hydrocarbon bearing formations have been pressure depleted over time and where the pressure is exceeded by the pressure in the overlying formations, unplugged wellbores could provide a pathway for the migration of fluids into the hydrocarbon bearing zones, thereby reducing the amount of hydrocarbons that ultimately can be recovered.

4.0 History of the Well Plugging Program:

The State of Texas has maintained a well plugging fund since 1965 to plug abandoned wells that pose a pollution hazard when: the responsible owner/operator cannot be located; is insolvent; or the responsible owner/operator is unwilling to plug the well. Initially, limited funds were appropriated from general revenue for this purpose. In 1983 a new Well Plugging Fund was established and supported primarily by a \$100 per well drilling permit fee, well plugging reimbursements, RRC administrative penalties, Office of the

Attorney General (AG) civil penalties, and interest on the fund. Since 1988, the fees from Statewide Rule 14(b)(2) well plugging extensions granted by Form W-IX filings also have gone into the fund.

In the mid-1980s, the disastrous fall in oil prices put the Well Plugging Program in serious jeopardy. Industry slashed drilling programs, which caused a sharp drop in receipts that supported the Well Plugging Fund. At the same time, the population of inactive wells surged as many operators went out of business. The Well Plugging Fund proved to be insufficient to handle the escalating number of abandoned wells that required plugging by the state.

This situation prompted the following developments:

- In 1991, the Railroad Commission sought additional funding and authority to address abandoned wells and abandoned oil field sites. The Texas Legislature enacted Senate Bill (S.B.) 1103, which replaced the old Well Plugging Fund with the more comprehensive Oil Field Cleanup Fund. New sources of revenue were added and the RRC was authorized to use the fund for several specific environmental purposes, including plugging and remediation. New financial assurance requirements, such as bonds or letters of credit, for oil and gas operators were also included.
- In 1992, the Commission amended its well plugging rule to establish requirements for monitoring and testing older, inactive wells.
- In 1993, the Texas Legislature enacted House Bill (H.B.) 2705, which streamlined the legal procedures for salvaging equipment from leases plugged and/or remediated with state

funds to offset plugging and remediation costs.

- In 1999, the Texas Legislature passed H.B. 3444. This bill authorized depositing, into the OFCU Fund, RRC fees for a fluid injection well permit, RRC fees to expedite a drilling permit application, and administrative penalties assessed for the violation of a safety or pollution prevention rule.

5.0 Oil Field Cleanup Fund

S.B. 1103 authorized the RRC to use the Oil Field Cleanup Fund to plug abandoned wells and clean up leases, pits, and other oil field sites when the responsible operators have failed to do so. The RRC routinely seeks reimbursement from the responsible operators for these expenditures through the Office of the Attorney General.

The OFCU Fund is supported entirely by fees, penalties, and other payments collected from the oil and gas industry. Drilling permit fees, which were the principal source of revenue for the Well Plugging Fund, were transferred into the new OFCU Fund. In place of the flat \$100 fee for a drilling permit, an applicant now pays a fee ranging from \$100 to \$200 depending on the depth of the well. The Commission continues to collect an annual fee of \$100 for a Statewide Rule 14(b)(2) plugging extension for each unplugged well that has been inactive for more than one year and is not covered by a bond or letter of credit.

Another major source of revenue for the fund established by S.B. 1103 is a regulatory fee on the production of oil and gas: 5/16 of a cent per barrel of oil and 1/30 of a cent per thousand cubic feet of gas. These fees are collected by the Comptroller and deposited into the fund.

In addition, S.B. 1103 established the following sources of revenue:

- Fees submitted as an alternative to a bond or letter of credit.
- Proceeds from forfeited bonds or letters of credit.
- Pipeline severance fees.
- National Pollutant Discharge Elimination System (NPDES) permit application fees.
- Hazardous oil and gas waste generation fees.
- Oil and gas waste hauler permit application fees.
- Well plugging and remediation reimbursements.
- Certain administrative and civil penalties.
- Private contributions.
- Interest.

During fiscal year 1992 (the first year that the fund was in place) a total of \$9,221,149 was deposited into the OFCU Fund. The RRC used the fund to plug 1,324 wells at a cost of \$5,687,126.00, which was three times as many wells as were plugged from the plugging fund in the prior year. Also, in fiscal year 1992, the Commission used the fund to conduct pollution abatement activities at more than 50 sites.

The RRC currently has an inventory of approximately 700 wells that have been approved for plugging from the OFCU Fund.

6.0 Well Plugging Priority System

The Well Plugging Priority System is a four-tier system that includes 20 human health, safety, environmental, and wildlife factors. Leaking wells receive the highest priority (1) and all other wells receive a priority between 2 and 4 depending on the level of threat to the environment. Wells with a priority 1,2, or 3 are recommended for plugging with Oil Field Cleanup funds.

The RRC's well plugging priority system has served as an example for other state programs. In December 1993, the Interstate Oil and Gas Compact Commission (IOGCC) recognized Texas's well plugging priority system as a model system in a guidance document titled Guidance for State Regulatory Programs - Well Plugging Prioritization Schedule.

The Well Plugging Priority Determination System is included as Appendix 1.

7.0 Salvage Provision

The RRC was given authority to salvage wellsite equipment to offset plugging costs in 1989. However, the required legal procedures were so costly and cumbersome that the RRC pursued only two salvage cases under this authority.

In 1993, the Texas Legislature passed H.B. 2705 to address this problem. This bill became effective on January 1, 1994. This legislation simplified administrative procedures for the complex court procedures originally required. The RRC's legal staff worked with the Attorney General's Office in drafting this legislation to ensure that the new procedures will address due process concerns. With this authority, the RRC is able to salvage wellsite equipment more efficiently. Also, the RRC is now able to salvage equipment to offset the costs of remediating sites as well as plugging wells.

From the inception of the Salvage Program through the end of August 1999, the RRC has conducted approximately 1,300 salvage operations and deposited over \$4 million into the OFCU Fund.

8.0 Well Plugging Expenses

Based on historical well plugging charges, the average well plugging cost in the State is approximately \$4,500 per well. However, costs can vary significantly. The most

expensive individual well plugged through the OFCU Fund cost over \$400,000. The operator had insufficient funds to perform the plugging.

The following table is a summary of the wells plugged by the Commission and the associated plugging costs for Fiscal Years 1984 to 1999:

<u>Fiscal Year</u>	<u>Pluggings Completed</u>	<u>Plugging Cost</u>
1984	177	\$1,112,197.81
1985	392	\$2,028,121.62
1986	714	\$2,583,271.00
1987	703	\$2,106,546.67
1988	627	\$2,162,255.30
1989	578	\$2,028,764.38
1990	432	\$1,993,128.18
1991	455	\$2,157,121.78
1992	1,324	\$5,687,126.00
1993	1,404	\$6,680,647.97
1994	1,326	\$6,005,776.94
1995	1,364	\$6,110,031.51
1996	1,366	\$5,259,989.52
1997	1,577	\$7,077,979.66
1998	1,604	\$8,458,780.73
1999	<u>1,126</u>	<u>\$4,482,244.00</u>
TOTALS	15,169	\$65,933,983.07

The graphs labeled “Figure 3” and “Figure 4” in Appendix 2 show the number of wells plugged and the plugging costs from Fiscal Year 1984 through 1999.

9.0 Case Histories

One example of a well that was plugged with the OFCU Fund involved working with several state and federal agencies. A leaking core hole was discharging salt water with a chloride concentration of 15,000 mg/l directly into the Colorado River (Figure 1).



Figure 1

Since the well was not readily accessible, a gravel bridge requiring a permit from the Army Corps of Engineers had to be built to reach the leaking well. The bridge was designed to allow the river to continue flowing during plugging operations. Additionally, coordination with the Colorado River Municipal Water District was necessary to decrease the flow of the river from the Ivie Reservoir during plugging operations. As a further complication, special care and planning was required to protect the Concho Water Snake, an endangered species that inhabits the area. This was coordinated with the U.S. Fish and Wildlife Service. Ultimately, the well was plugged for approximately \$26,000 with the cooperation of all agencies involved, and this source of chlorides was eliminated from the Colorado River.

Another example involved a Pecos County well. After the operator began plugging operations, the well began leaking approximately 96,000 barrels of water per day (Figure 2).



Figure 2

The operator and the plugging crew abandoned the well, and the RRC assumed plugging operations. Subsequently, hydrogen sulfide gas was found to be emanating from the well. To plug the well, rig personnel had to wear protective air breathing equipment due to this poisonous gas. During plugging operations, hydrogen sulfide gas

concentrations were continually monitored. The well was safely plugged with no injuries at a cost of approximately \$87,400.

10.0 Well Plugging Procedures

The RRC gained authority to promulgate well plugging rules in 1919 when S.B. 350 was passed. Article 3 required that “dry or abandoned wells be plugged in such a way as to confine oil, gas, and water in the strata in which they are found and prevent them from escaping into other strata.” Article 4 stated that it “shall be the duty of the supervisor and his deputies to supervise the plugging of all wells.” This referred to the Chief Supervisor in Austin and the Deputy District Supervisors at the various RRC District Offices. Article 7 provided that rules and orders of the RRC could be enforced through imposition of fines up to \$5,000.

In February 1934, the RRC issued specific plugging instructions, which required that plugging operations be started within 20 days on all dry and abandoned wells or when production operations ceased. The main thrust of the plugging instructions was to protect the producing formation to the “greatest degree.” Cement was required to be circulated through tubing or drill pipe across these producing formations. Non-producing formations, where no high-pressure gas sands or commercial water sands were encountered, could be plugged with mud-laden fluid.

The protection of fresh water sands was not a requirement until 1957. In a dry hole, the short string of surface casing must be cemented in its entirety, and the deepest fresh water zone must be protected by a cement plug covering this water zone to at least 50 feet above and below the zone.

In 1966, the RRC promulgated Special Order No. 20-56,535. This version of Rule 14

contains many of the specific well plugging requirements of the current rule, including requirements regarding the setting of cement plugs to protect fresh water sands.

The RRC's Statewide Rule 14(b)(2) states: "Plugging operations on each dry or inactive well shall be commenced within a period of one year after drilling or operations cease and shall proceed with due diligence until completed. Plugging operations on delinquent inactive wells shall be commenced immediately unless the well is restored to active operation. For good cause, a reasonable extension of time in which to start the plugging operations may be granted pursuant to the following procedures." A well that has been shut-in for a period in excess of 12 months is considered non-compliant if the well is not plugged, has not been returned to active operation, or has not received a plugging extension.

Statewide Rule 14 contains specific plugging requirements to protect usable quality water from pollution and to isolate each productive horizon. If an operator does not initiate plugging operations within a period of one (1) year for each dry or inactive well, then that operator must file for an exception to the rule or be faced with possible administrative and civil penalties. An exception can be obtained by filing a letter of credit, a performance bond, or a Form W-IX, "Application For Future Re-Entry of Inactive Wellbore and 14(b)(2) Extension Permit."

In 1992, the RRC amended its plugging rules requiring older wells to be tested to be eligible for plugging extensions. For inactive wells more than 25-years old, an annual fluid level test was phased in over a three-year period. This provision states that if the fluid level in a well is near or above the base of fresh water, the operator will have to conduct a successful mechanical integrity test to qualify for a plugging extension. A

successful mechanical integrity test may be substituted for the annual fluid level test for up to five years. In addition, beginning January 1, 1997, all wells that were both more than 25 years old and inactive for more than 10 years were required to be tested for mechanical integrity every five years.

These new testing procedures aid in identifying wells that are potential pollution hazards. They also help the RRC define areas in the state that deserve a higher priority in the RRC's Well Plugging Program.

The wellbore diagrams in Appendix 3 illustrate the plugging requirements of Statewide Rule 14.

11.0 Bay and Offshore Wells

In 1999, there were approximately 1,100 bay and offshore wells. Of that number, approximately 970 wells were either active or shut-in compliant wells. The remaining 130 wells were not in compliance with Statewide Rule 14. Of these approximately 130 wells, about 100 were bay wells and 30 were offshore wells.

The following is an example typical of the problems encountered by the RRC in dealing with non-compliant bay wells. The Well Plugging Section recently completed plugging operations on two bay wells located just north of Port Isabel, Texas.

RRC inspections on these two wells determined that the wells were in extremely poor mechanical condition. The wellheads and surface equipment were severely corroded, which resulted in leaks at the wellhead. These wells were out of compliance with Statewide Rule 13(c)(6), which deals with wellhead control, in addition to Statewide Rule 14(b)(2). Also, the Well Plugging Section contacted the GLO to determine the lease rights to these wells.

The GLO advised this Section that a valid lease did not exist for these wells.

One of the wells - a dually completed well - was plugged under emergency conditions because the well began leaking and the operator, after notice by the RRC, failed to respond and repair the leak. While plugging operations were ongoing, the operator attempted to transfer the wells to another operator by filing a Form P-4, "Producers Transportation Authority and Certificate of Compliance," which ultimately would have transferred the plugging responsibility. The transfer was not allowed because the well was authorized for plugging with monies from the OFCU Fund and plugging operations were ongoing. The operator then attempted to file a new Form P-5, "Organization Report," to change its status from a sole proprietorship to a corporation, seeking protection under corporate law. Again, the operator was not allowed to transfer the wells into the new organization because plugging operations were ongoing.

RRC inspections on other bay wells have found similar conditions regarding the integrity of the wellhead equipment. Abandoned wells that require plugging with monies from the OFCU Fund are typically in poor mechanical condition and pose a severe risk of pollution to the surrounding waters.

The Well Plugging Section also reviewed the P-4's of 40 bay wells to determine the ownership history. This review showed that the P-4's for these wells are routinely transferred from major operators to small independents. Specifically, the review showed that these wells were transferred an average of six times, ranging from two to 11 times, with the earliest transfer in 1977. This demonstrates that over a period of time, a well can wind up in the hands of an operator who is financially unable to plug the well and who also seldom inspects the well prior to transfer to determine if the well is properly

equipped for production. This type of continued transfer of wells can and often does result in the RRC having to undertake the plugging operations because the responsible operators do not have the financial resources to plug the wells. This type of activity threatens to rapidly deplete the resources of the OFCU Fund.

The RRC's financial assurance program does not adequately address the plugging costs for bay and offshore wells, which have an adverse affect on the OFCU Fund. The financial assurance program is designed to focus on the vast majority of wells, which are on shore and not designed to deal with the problem of non-compliant bay and offshore wells that may ultimately require plugging with monies from the OFCU Fund. Operators can file a Form W-IX with a filing fee of \$100 to place a well into compliance with Statewide Rule 14(b)(2) and receive an extension of one year from the plugging requirements for any well on shore or offshore.

12.0 Financial Assurance

To slow the growth of abandoned wells and oil field sites, S.B. 1103 established new financial responsibility requirements for the approximately 12,500 oil and gas operators in the state. Anyone conducting oil and gas operations regulated by the Railroad Commission must file an annual organization report (Form P-5) and at the same time must submit a bond or alternate form of financial security. This financial security covers all of the operator's oil and gas operations regulated by the Commission.

S.B. 1103 gives an operator the choice of several methods of satisfying this requirement. These options are:

1. If the operator's only operations are wells, an individual bond or letter of credit in an amount equal to \$2 per

foot of the aggregate total depth of all of the operator's wells;

2. A blanket bond or letter of credit in an amount equal to:
 - A. \$25,000 if the operator has 10 or fewer wells or has no wells, but performs other operations;
 - B. \$50,000 if the operator has 11 to 99 wells; or
 - C. \$250,000 if the operator has 100 or more wells;
3. If the operator can demonstrate an acceptable record of compliance with Commission safety and pollution prevention rules during the previous 48 months, an annual fee of \$100;
4. An annual fee of 3% of the amount of the bond that would otherwise be required under Items 1 and 2 above; or
5. A first lien on oil field equipment with a salvage value equal to the amount of the bond that would otherwise be required.

Note, if an operator chooses to pay a fee or file a lien as provided by Items 3, 4, and 5 rather than file a bond or letter of credit, the operator must also pay an annual fee of \$100 for each unplugged well that has been inactive more than one year.

As a further incentive for compliance, S.B. 1103 prohibits the RRC from accepting a drilling permit application if the applicant or other organization under common ownership or control has outstanding, finally determined violations of safety or pollution prevention rules that occurred within the preceding five years. A finally determined violation is considered outstanding unless the conditions that constituted the violation have been

corrected and all associated penalties and costs have been paid.

13.0 Projections On The Future Of The Oil Field Cleanup Fund

The revenue projections for Fiscal Years 2000 and 2001 forecast annual revenues of \$12.3 million and \$12.2 million, respectively. The expense projection is \$13.6 million for each of these fiscal years. The Commission's well plugging goal is approximately 1,000 wells for each of the two fiscal years.

14.0 TNRCC/EPA Grant

The RRC has looked for new and innovative funding sources to supplement the OFCU Fund and has received approval for a grant to perform plugging and cleanup activities in the Upper Colorado River Basin with an ultimate goal to reduce the salinity in the river. The grant has an approximate value of \$2.8 million.

The RRC plans to accomplish the objective of this grant by enhancing its current Oil Field Cleanup Program through the following activities: (1) the proper plugging of any well that is discovered leaking into the Colorado River Basin; (2) the reentry and re-plugging of any plugged well that may not be properly plugged under current standards and poses a threat of pollution to the Colorado River Basin; (3) the determination of the sources of saline seeps in the Colorado River Basin (natural or oil and gas related operations) and elimination of these sources, if possible and practicable; (4) the preventative plugging of wells that penetrate the highly pressurized and highly saline Coleman Junction Formation in accordance with current regulations which reflect best management practices; and (5) the assessment and possible remediation of abandoned reclamation plants and commercial saltwater disposal facilities within the Upper Colorado

River Basin. This project will enhance the pollution prevention efforts of the RRC as well as restore and maintain the water quality in the Colorado River Basin, which is targeted for restoration in FY 99 and 2000 under the Texas Unified Watershed Assessment and 319(h) Nonpoint Source Assessment Reports.

15.0 Texas General Land Office (GLO) Funding

In another development, the RRC has recently executed a Memorandum of Agreement with the GLO whereby the GLO will fund the plugging of bay and offshore wells located in state waters. This project is a joint effort between the RRC and the GLO to identify abandoned bay and offshore wells and bring the wells into compliance.

The RRC and the GLO will evaluate bay and offshore wells to determine which wells pose the greatest threat. After the wells are identified, the RRC will be responsible for plugging the wells. Estimated plugging costs for bay and offshore wells are approximately \$50,000 and \$200,000 per well, respectively.

This project is currently underway. Five wells in Galveston Bay have been selected for plugging. The bids have been awarded, and plugging operations are scheduled to begin in January 2000.

16.0 Additional Plugging Notes

During the last 15 years, the Railroad Commission of Texas has made a committed effort - through compliance audits, routine inspections, response to citizen complaints and focused sweeps - to identify the unplugged oil and gas wells that present the greatest threat to the environment. Based on a highly effective prioritization system, which other states have used as a model, the wells with the greatest possible impact to the environment are being properly plugged.

Unlike most operator well pluggings, the RRC's state well pluggers rarely know what will be encountered once a well is reentered for plugging. Typically, the wells selected for plugging are old and, if records exist, they frequently provide insufficient data to determine the downhole conditions of the well. Often there is no surface casing in these wells, and it is not uncommon for an operator to dispose of waste (junk) down the wellbore. Junk found in holes, which usually has to be retrieved before properly plugging the well, can increase the anticipated plugging cost ten-fold.

Abandoned leaking wells also increase plugging costs and are often referred to the RRC by citizens due to the obvious condition of the well. In all cases, leaking wells receive a Priority 1 status and are plugged as quickly as possible. When safety or environmental concerns do not warrant immediate action, wells are bid out for plugging and contracts awarded per state procurement statutes. If, however, there is concern for safety or the environment, then well pluggings are performed on an emergency basis.

To ensure the lowest and best bid, all well pluggings follow state bid requirements. Projects over \$25,000 are listed on the Internet to attract competitive bidders. Also, after each well plugging, a contractor evaluation is performed to rate the performance of the well plugging contractor. These scores are then used in the bid evaluation process to determine the "best value" bid.

Appendix 1

Well Plugging Priority Determination System

FACTOR	WEIGHT
1. Well Penetrates a Major Aquifer:	<u>5</u>
2. Major Aquifer Outcrop in Vicinity of the Well:	<u>5</u>
3. Well Penetrates a Minor Aquifer:	<u>3</u>
4. Minor Aquifer Outcrop in Vicinity of the Well:	<u>3</u>
5. Well Penetrates High Volume/High Pressure SW-bearing Formation:	<u>5</u>
6. Well Penetrates Other SW-bearing Formation:	<u>3</u>
7. Within 100' of River, Creek, or Lake:	<u>5</u>
8. Within ¼ Mile of River, Creek, or Lake:	<u>3</u>
9. Within 1 Mile of River, Creek, or Lake:	<u>2</u>
10. Known Sensitive Wildlife Areas:	<u>5</u>
11. Leaking Oil, Gas, and/or Saltwater:	<u>Priority 1</u>
12. Complaint-related:	<u>1</u>
13. Injection or Disposal Well:	<u>4</u>
14. Drilled Prior to 1965:	<u>1 – 3</u>
15. County Population = 100,000, or greater:	<u>3</u>
16. County Population < 100,000, but > 10,000:	<u>2</u>
17. County Population = 10,000, or less:	<u>1</u>
18. Well in H ₂ S Field:	<u>4</u>
19. Non-existent Operator or Operator's P-5 Inactive/Delinquent > 2 Years:	<u>2</u>
20. Unique Environmental, Safety, or Economic Concern:	<u>1 – 10</u>

Total Weight: _____

Priority: _____

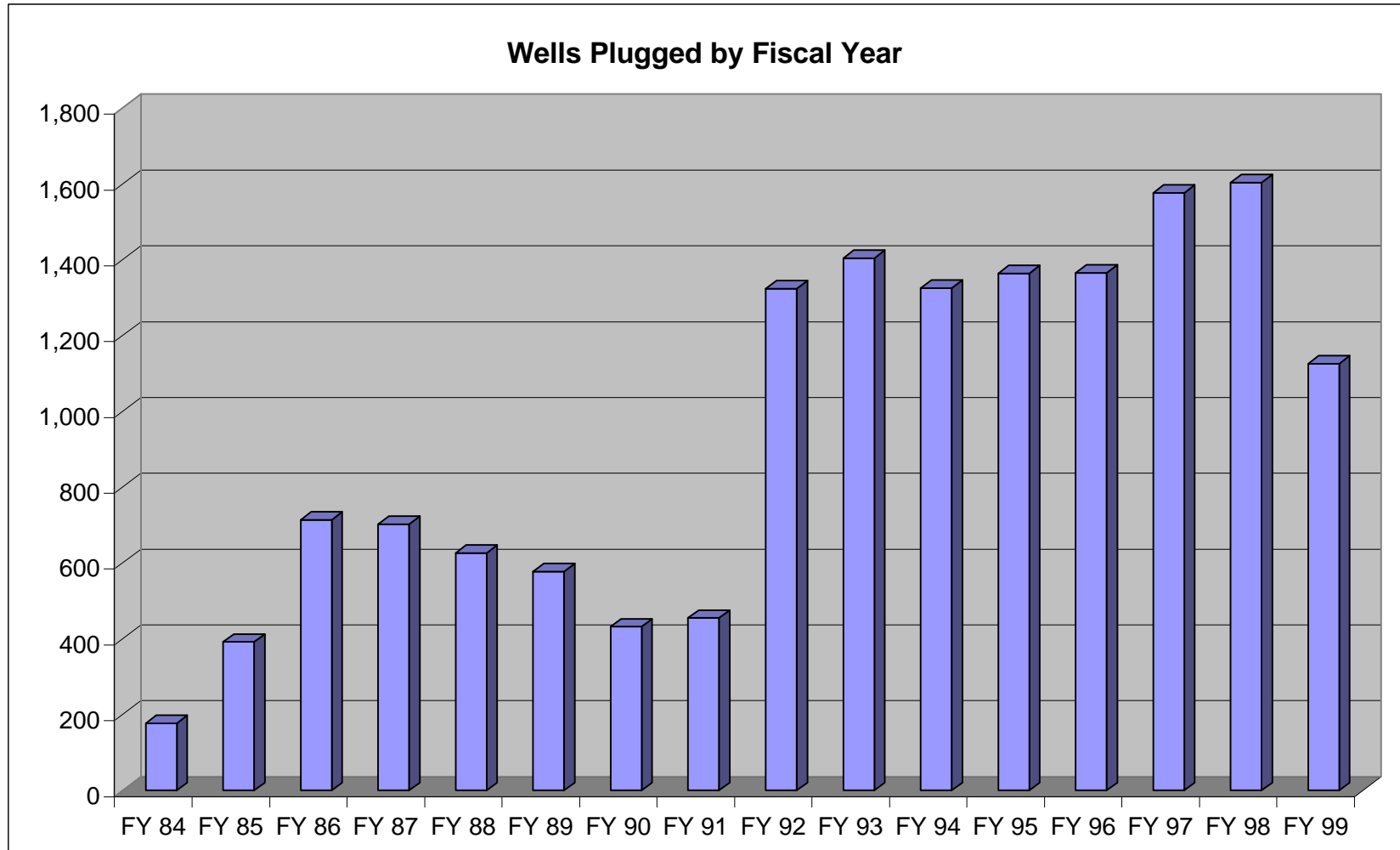
Priority 1 = Leaking Well (surface or subsurface)

Priority 2 = Total Weight = 25, or greater

Priority 3 = Total Weight = 15 - 24

Priority 4 = Total Weight = 14, or less

Appendix 2



Fiscal Year	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	Total
Wells Plugged	177	392	714	703	627	578	432	455	1,324	1,404	1,326	1,364	1,366	1,577	1,604	1,126	15,169

Figure 3

Appendix 2

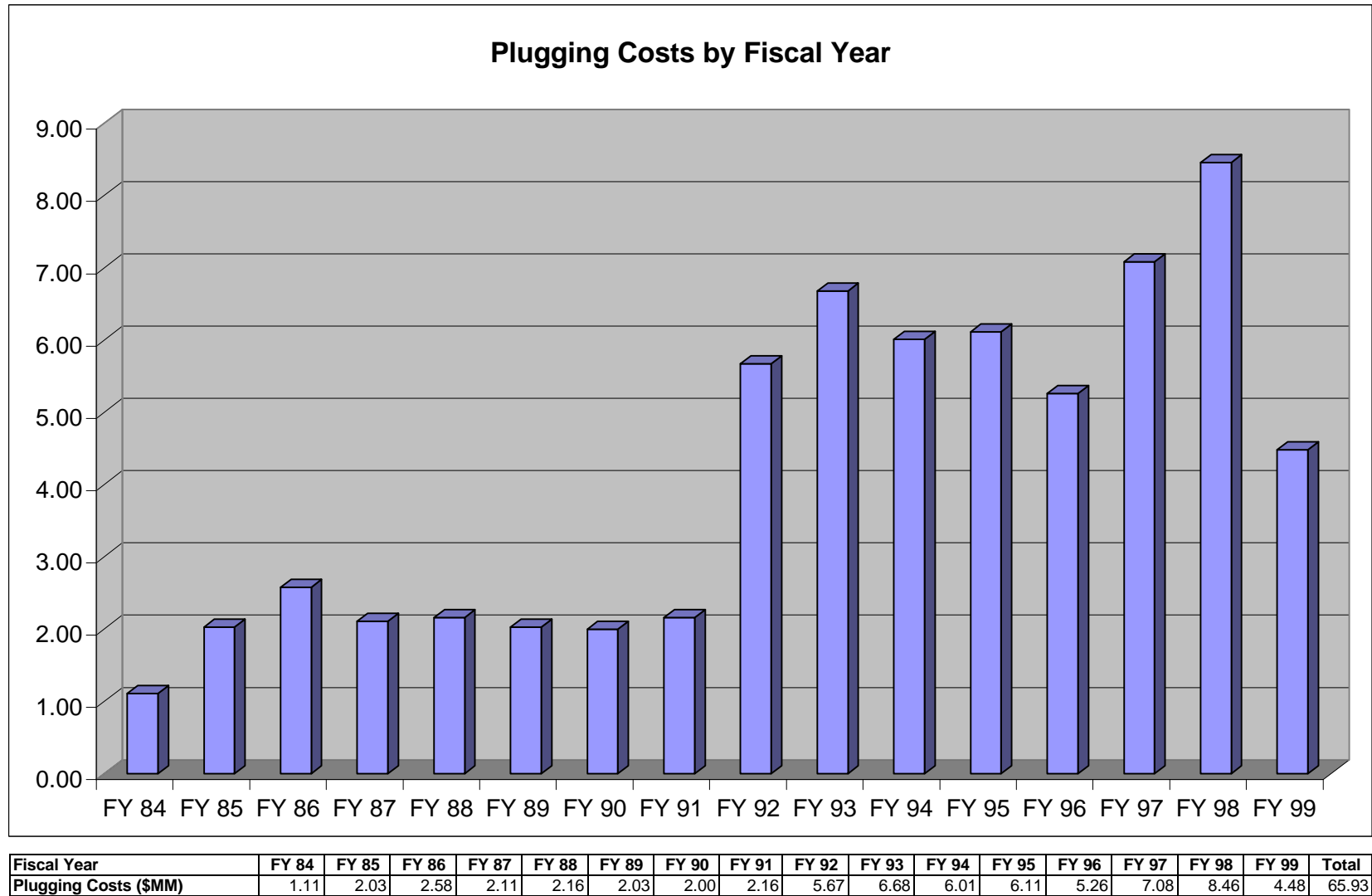


Figure 4

Appendix 3

SUFFICIENT SURFACE CASING SET TO PROTECT ALL USABLE WATER

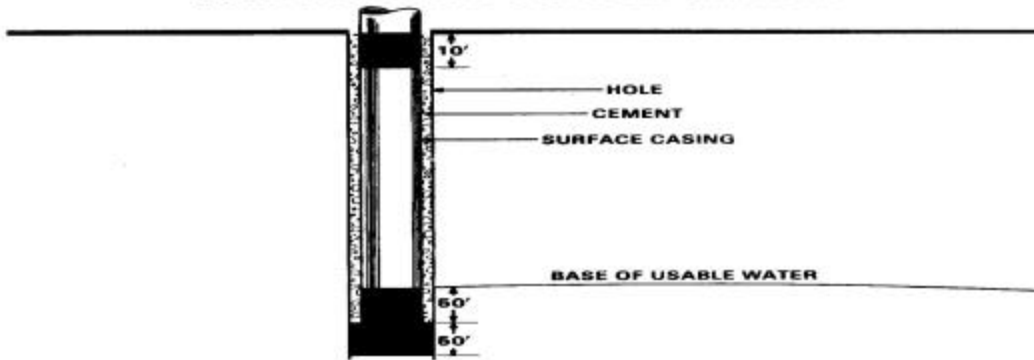


Figure 5

INSUFFICIENT SURFACE CASING SET TO PROTECT ALL USABLE WATER

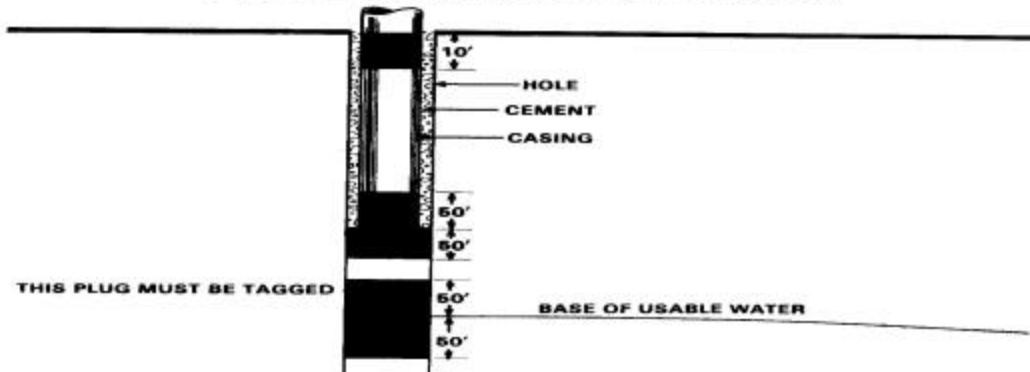


Figure 6

INSUFFICIENT SURFACE CASING WITH SEPARATION DEPTHS SPECIFIED BY TEXAS WATER COMMISSION

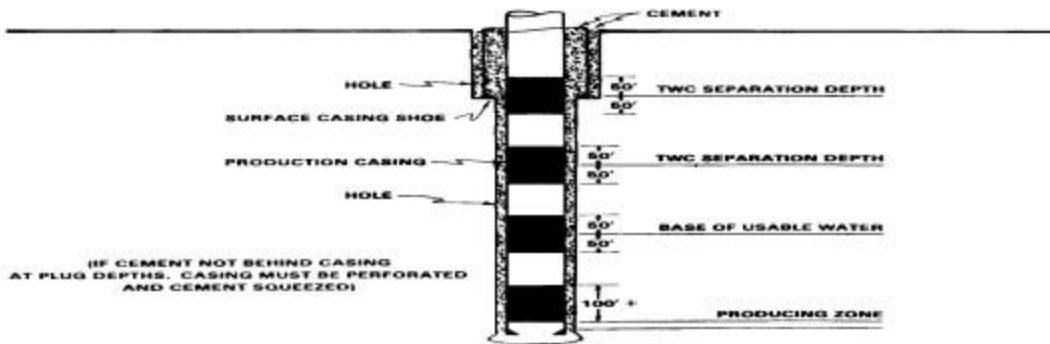


Figure 7

Appendix 3

SURFACE CASING SET DEEPER THAN 200' BELOW BASE OF USABLE WATER

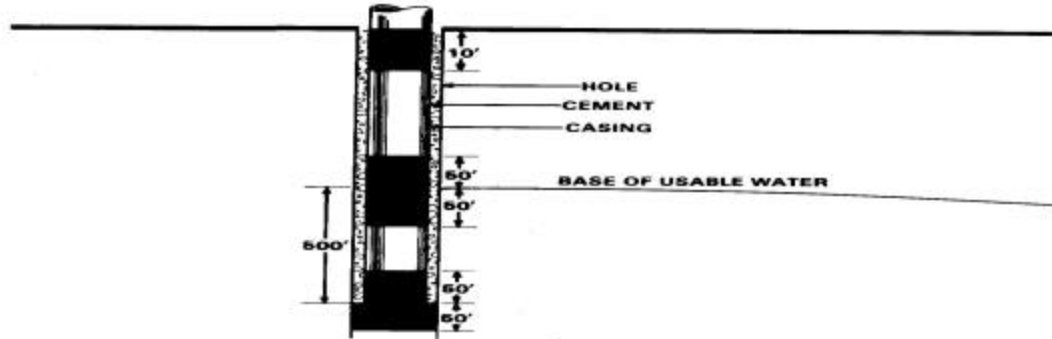


Figure 8

WELLS WITH INTERMEDIATE CASING & CEMENTED THROUGH ALL USABLE & PRODUCTIVE HORIZONS

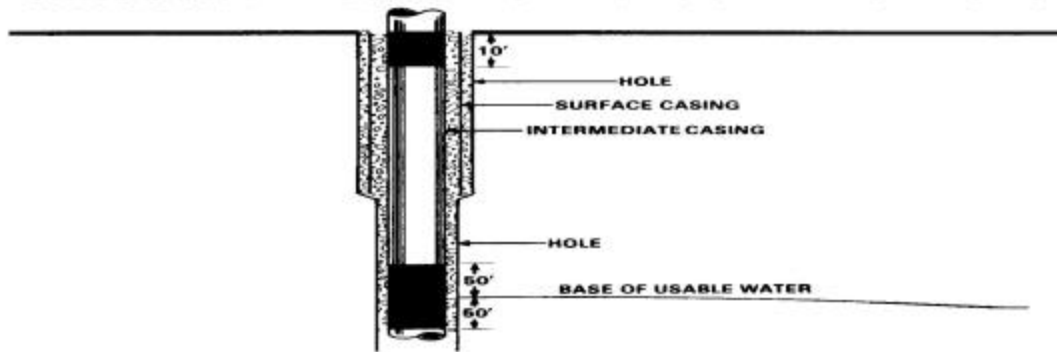


Figure 9

INTERMEDIATE CASING NOT CEMENTED THROUGH ALL USABLE WATER & PRODUCTIVE HORIZONS

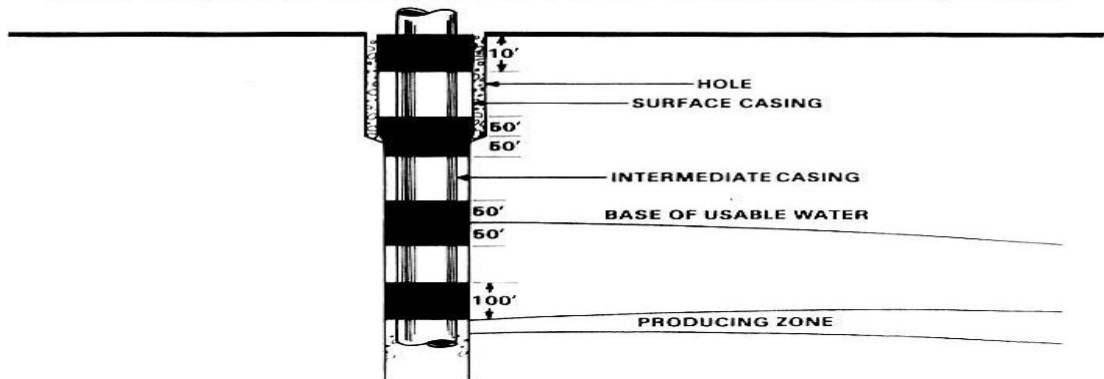


Figure 10

Appendix 3

**WELLS WITH PRODUCTION CASING
NOT CEMENTED THROUGH ALL
USABLE WATER & PRODUCTIVE HORIZONS**

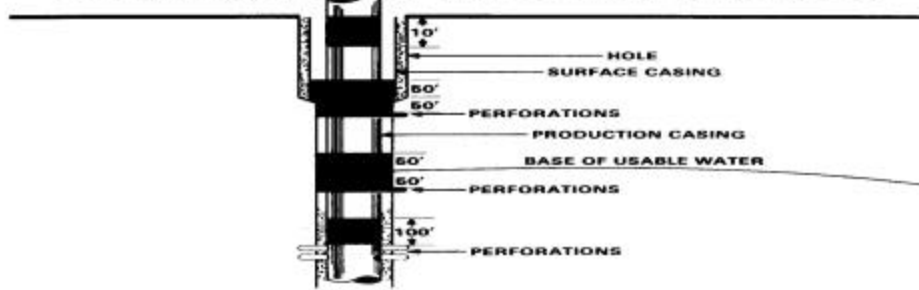


Figure 11

**WELLS WITH PRODUCTION CASING &
CEMENTED USING MULTI-STAGE TOOL**

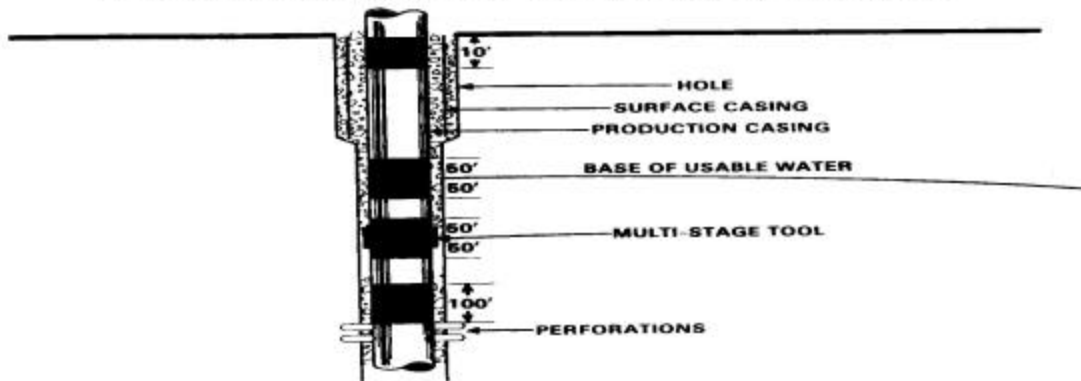


Figure 12

**WELLS WITH PRODUCTION CASING
AND CEMENTED THROUGH ALL
USABLE WATER & PRODUCTIVE HORIZONS**

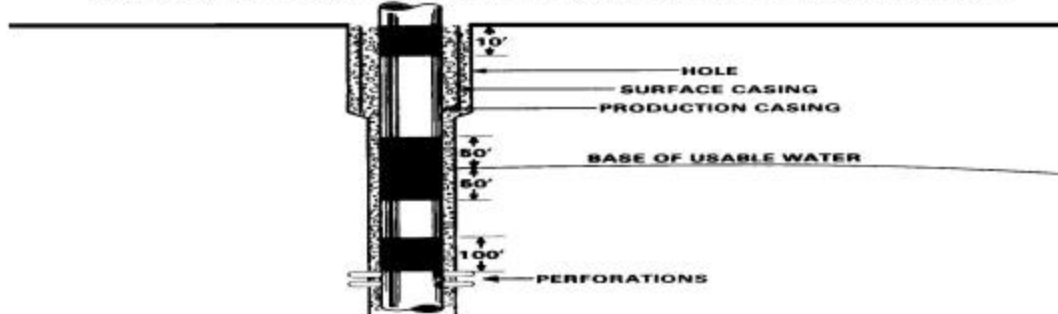


Figure 13

Appendix 3

WELLS WITHOUT PRODUCTION CASING

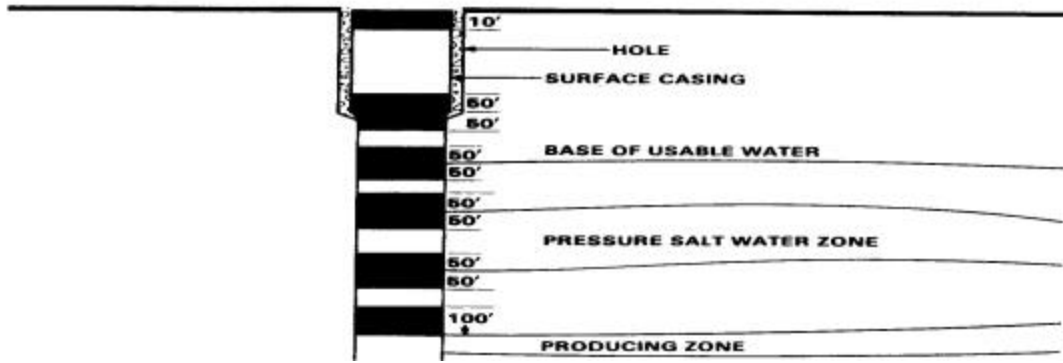


Figure 14

HORIZONTAL DRAINHOLE WELL PLUGGING

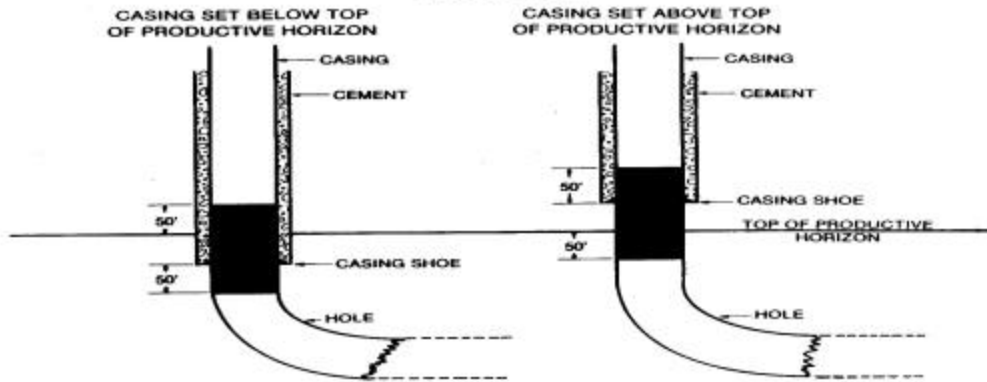


Figure 15