Talking Points: OLD PLUGGING AND ABANDONMENT PROGRAM

1. First addressed in 1982 by Dave Curry (O&G Administrator) in a letter to Bud Hendry (State Geologist & Bureau Chief - FGS).
    a. Pre-rules 1946; Marginal Rules 1946 - 1972; Effective rules 1972.
    b. There are somewhere between 5 and 150 +/- wells to be considered.
    c. Suggestion made that money for the program may be generated through severance taxes.
2. Addressed in 1990 in a letter from Bob Caughey (Geologist and Supervisor of Ft. Myers O&G Office) to Walt Schmidt (State Geologist - Chief FGS).
    a. Bob Caughey extensive research revealed the following concerns:
        i. USDW protection
        ii. Need for replugging in four zones/categories in many wells...
            1. Four Categories of plugs:
                a. Production Zone
                b. Intermediate csg
                c. USDW plug
                d. Surface csg
        iii. Cost estimates were $100K to $400K (per well???)
        iv. Time to complete: 5 - 10 years
        v. Numbers: 100+ wells
        vi. Potential problems if program not begun... (???)
3. 1992 Woodward Clyde Consultants Rpt.
4. 2002 Legislature appropriated $350,000/year for 5-year program.
5. 2003 - 2005 Plugging programs remediated 9 wells at a cost of $600K - $650K.
6. See attached map and list of selected top 25 wells to be plugged and abandoned.

Spencer, Steve

From: Coates, John
Sent: Thursday, November 04, 2010 10:22 PM
To: Spencer, Steve
Subject: RE: financial surety

Steve,

I do recall information you all had shared on the funds that had been available for plugging some of the old wells. The thought is there, but, at the moment I don't have a viable option. Most of the grant funds I am familiar with are tied more directly to surface water/CWA funding. Would you keep this in mind and talk with Ed. To the extent there are wells that may be a threat to groundwater, I'd like to get some basic bullets that put forth some perspective on those items that could be a priority. Perhaps a one page briefing document would be in order. Something for you and Ed to consider?

John

John A. Coates, P.E.
Deputy Director
Florida DEP, Division of Water Resource Management
Office: (850) 488-8217
Fax: (850) 412-0714

From: Spencer, Steve
Sent: Thursday, November 04, 2010 12:05 PM
To: Coates, John
Subject: financial surety

John,

While we are revisiting the topic of financial assurance, has any thought been given to funding remediation of inadequately plugged old wells? We had a program like this prior to coming the BOMMR.

ss

Steve Spencer, P.G.
Florida Department of Environmental Protection
Bureau of Mining and Minerals Regulation
2051 East Paul Dirac Drive, MS 715
Tallahassee, FL 32310

Phone No. (850) 488-8217, ext. 65

Problems, Challenges, Controversies:

Old Well Plugging Program:

- These programs are a big deal in other states. We identified about 150 candidate wells to be considered for plugging.
- One of our inspectors during the 1980's put together a report and case for plugging old wells
- 1992: We paid Woodward Clyde Consultants $70,000 to compile (from O&G and WMD files) an inventory and priority list of potentially improperly plugged old wells.

February 2004, Permit 110
Warren Zwanka (SRWMD), & Al Keaton
(FDEP/O&G) attempting to run geophysical logs

- 2002: Legislature appropriated $350K/yr for a 5-year plugging program
- 2003, 2004, 2005: Our Petroleum Engineers:
  - Designed plugging procedures
  - Set up contracts with a plugging company
  - Managed three plugging projects
  - Plugged 9 wells at a total cost of $600K to $650K.
  - Remaining appropriations were held back

2004, OLD WELL REPLUGGING PROJECT REPORT

2004 was another successful year of the "Old Oil Well Replugging Project" in terms of, data gleaned, benefit to the state's aquifers, and cost effectiveness. Enclosed are schematics of the wellbores, actual daily morning reports, and photos. A (c.d.) that includes all the photos and a combination of reports are yours to keep along with these hard copies.

A synopsis of the attached reports and our finding are as follows:

Permit Number 110, (see schematic) which is located in Levy County and was the last of six wells that had a high priority wells identified in the Woodward Clyde report and was prioritized by the Department to be replugged. Levy County is in the Suwannee River Water Management District, and we enjoyed 100% support of their field personal and management in this project. Permit Number 110 had the salt water/fresh water contact, USDW, and the depth of potable all exposed to one another and the wellbore was flowing at surface. The surface casing had deteriorated to a point the casing appeared to full of holes. Plugging the wellbore isolated all the aquifers from each other.

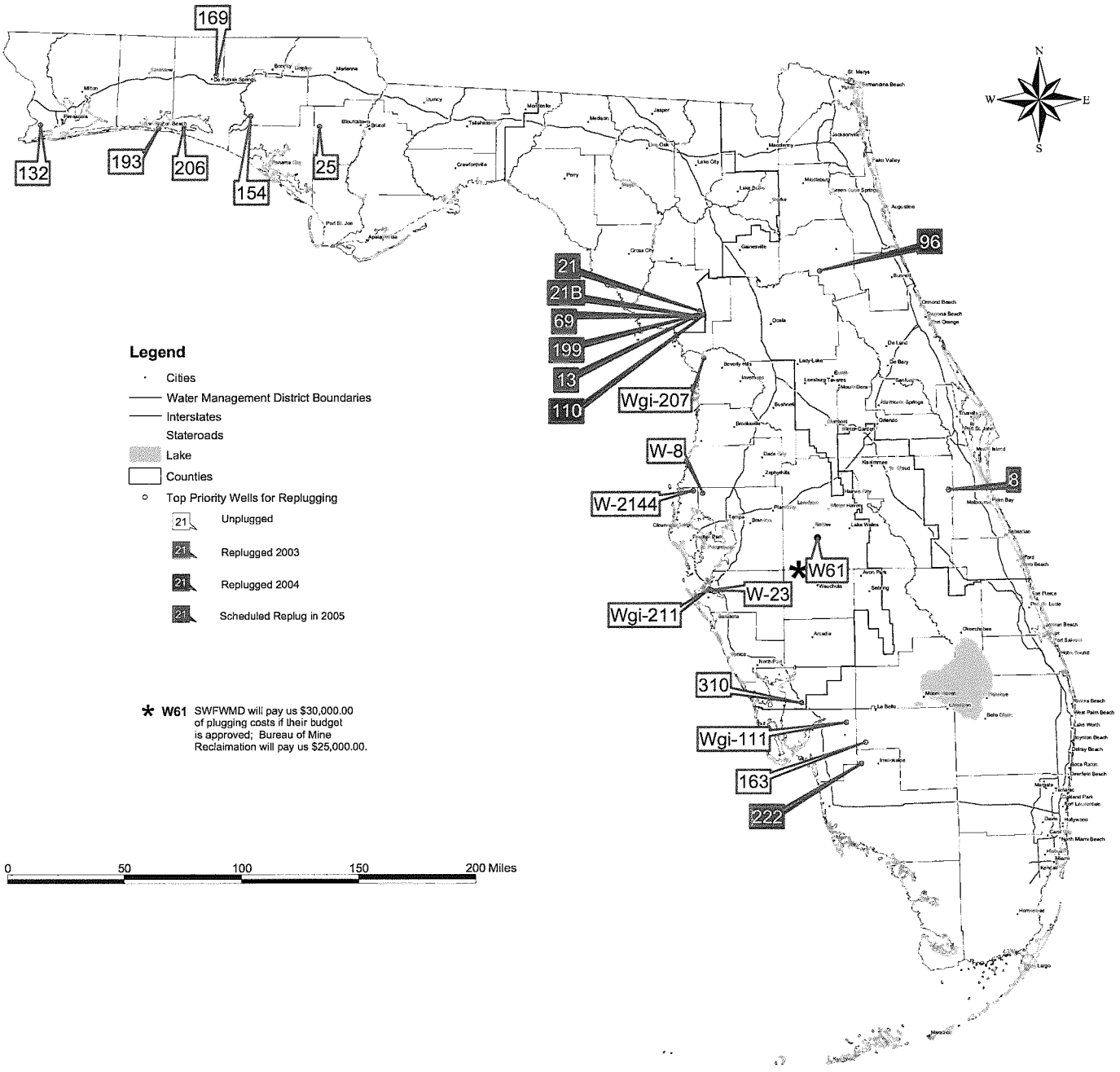
Permit Number 96, (see schematic) located in Putnam County and is in the St. John's River Water Management District (SJRWMD). As with the well above, this well had been selected for evaluations and replugging. Permit Number 96 also had the fresh water/salt water contact, USDW, and the depth of potable water, all exposed to each other. The possibility for commingling of aquifers was likely. The annulus from approximately 1400 feet to surface was completely exposed open because the wellbore was open, allowing fluid movement between aquifers. The 20 sack cement plug which had been leaking was set in 1949. Replugging (as the drawing indicates) repaired all these problems.

Permit Number 222, (see schematic) in Collier County is in the Southwest Water Management District. This well was originally drilled in 1955 by Humble Oil (ExxonMobil). The wel
USDW, from the Fre
discovered the ope
in the files and
hard way an
wellbore i
and are
work
the
the nu
and final

FOCUS REVIEW

September, 2000, Revised May 2005

TOP PRIORITY WELLS SELECTED FOR REPLUGGING



Top Priority Wells Selected for Replugging

Revised April 2005

Selection Criteria:

Potential for Movement of Groundwater Up or Down Wellbore, Proximity to Large Freshwater Well Fields, Proximity to Municipal Waste and other Injection Wells, Exposure to Unprotected Underground Sources of Drinking Water, and/or Surface Access

Water Management District	Permit Number	Remedial Plugging By FGS	Well Depth (feet)	USDW Open (feet)	County	Flow Potential	Within 2 Miles of Supply / Well Field	Top Ten	Selected By:	Comments:
Northwest	206		6010	500	Walton	Upward	Yes	7	NWFWMD	Found in wooded area close to neighborhood
Northwest	169		4974	630	Walton	Borderline Downward	Yes		NWFWMD	Looked for, but not yet found.
Northwest	154		5000	500	Washington	Borderline Upward	Yes	8	NWFWMD	Found in wooded area.
Northwest	193		6250	350	Okaloosa	Upward	Yes		NWFWMD	Found in neighborhood in a back yard.
Northwest	132		7494	≥650	Escambia	Upward	Yes	6	NWFWMD	
Northwest	25		3437	1130	Calhoun	Borderline Downward	No	10	FGS	
Suwannee	13	April 2003	3997	Minimal	Levy	Borderline Downward	No	2	SRWMD	
Suwannee	21A	April 2003	772	≤650	Levy	Upward	No	3	SRWMD	
Suwannee	21B	April 2003	697	≤650	Levy	Upward	No	3	SRWMD	
Suwannee	69	April 2003	2173	≤500	Levy	Borderline Downward	No	4	SRWMD	
Suwannee	110	February 2004	2013	≤1000	Levy	Borderline Downward	No	5	SRWMD	
Suwannee	199	April 2003	3857	≤650	Levy	Upward	No	5	SRWMD	
St. Johns	96	March 2004	3807	≥700	Putnam	Upward	No	11	SJRWMD	DEP is Landowner
St. Johns	8	March 2005	8045	670	Osceola	Upward	No	9	SJRWMD	
St. Johns	410		3510	2085	Duval	Upward			SJRWMD	No longer priority. Well to be used by USGS and/or City of Jacksonville. Plugged in 1971 62C-26.003(9) repealed
South Florida	222	March 2005	11,937	≥500	Collier	Upward	Yes	1	FGS	Plugged during 2004 and 2005.
South Florida	310		12,459	1100	Charlotte	Upward	No		FGS	
South Florida	163		2445	1460	Hendry	Upward	No		FGS	In citrus grove. Wellhead not yet located.
South Florida	Wgi-111		3018	≥400	Lee	Upward	No		FGS	On house lot in Lehigh Acres.
Northwest	25		3437	1130	Calhoun	Borderline Downward	No	10	FGS	
Southwest	W-61		4540	?	Polk	Upward			FGS/SWFWMD	Jointly selected with SWFWMD, who is providing a $30,000 grant toward plugging the well. The Bureau of Mine Reclamation has also offered up to $25,000. (Plugging effort collapsed when we ran out of money for Spring 2005 plugging campaign.)
Southwest	W-8		3289	≤400	Hillsborough	Upward	No		SWFWMD	On grounds of Tampa Bay Downs racetrack. Wellhead not yet located.
Southwest	W-2144		3563	≤300	Pinellas	Upward	Yes		SWFWMD	In neighborhood, possibly under condo.
Southwest	Wgi-211		2665	≤550	Manatee	Upward	No		SWFWMD	
Southwest	W-23		1265	≤550	Manatee	Upward	No		SWFWMD	Adjacent to Wgi-211
Southwest	Wgi-207		1900	≤500	Citrus	Downward	Yes		SWFWMD	

62C-27.009 PFA Requirements

Petroleum History Resources

Search this site

News & Resources

This Week in Petroleum History...

Oil & Gas Museum News

About the Society

State Resources

Popular Articles

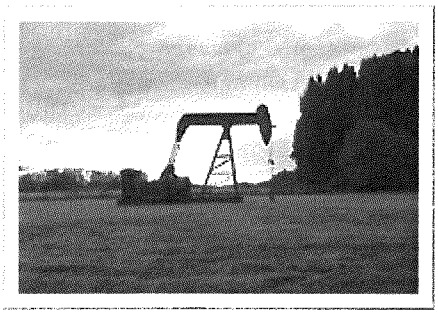
Offshore Oil History
Making Hole
The 42-Gallon Oil Barrel
All Pumped Up
Mabel's Eyelashes
Cantankerous Combustion
Ohio Offshore Wells
The Blue Flame
Sinclair Oil Dinosaur
Dramatic Oil Company
Deep Sea Roughnecks
ROVs: Swimming Wrenches
Petroleum & Sea Power
Rigs to Reefs
Exploring Luling, Texas
The First Dry Hole
Wyoming Oil Pioneers
Story of Petroleum
Florida's First Oil Well
Indiana's Natural Gas Boom
End of Gushers

Welcome to the American Oil & Gas Historical Society special website for students and teachers.

Donate to AOGHS

Energy Education Articles >

Florida's First Oil Well



Among its records for dry holes, Florida's first – but certainly not last – unsuccessful attempt to find commercially viable oil reserves began in 1901, not far from the Gulf Coast panhandle town of Pensacola.

Two test wells were drilled, the first to 1,620 feet and the second a hundred feet deeper. Both were abandoned. Whether that wildcatter was following science or intuition, contemporary accounts of his efforts reveal only a small historical footnote: "Florida's first dry holes."

Twenty years later, as America's oil demand continued to soar, oil still had not been found in Florida. The state's panhandle still looked promising – despite a growing list of failed drilling ventures.

Indian legends and a wildcat stock promoter's claim of oil inspired yet another attempt near today's Falling Waters Park, about 100 miles east of Pensacola. A tall, wooden derrick and steam-driven rig were used to drill. At a depth 3,900 feet, a brief showing of natural gas excited area residents with a false report of a possible gusher. Undeterred, the oilmen continued to drill to a depth of 4,912 feet before finally giving up.

News & Events

Editor's Picks

Oilfield Technology & the "Conroe Crater"
Secret Pipeline of WWII
Ames Crater Museum
Conrad Hilton's Oilfield Hotel
Discovering Oklahoma Oil
Felty's Outdoor Oil Museum
Seuss I Am, an Oilman
Visitors from Azerbaijan

More Newsletters

Oil & Gas Museums (under construction)

Photography (under construction)

Donate to AOGHS

Contact

bawells@aoghs.org

Bruce Wells
Executive Director
(202) 387-6996

Navigation

Energy Education Articles
What's New?
Sitemap

No oil of commercial quantity was found and the well was capped in 1921. Another dry hole.

Barron Collier

Around this time, one of Florida's most revered visionaries and entrepreneurs, Barron G. Collier, was busily purchasing land in the sparsely populated southwest part of the state. Between 1921 and 1923, he acquired about 1.3 million acres that would eventually become Collier and Hendry counties, including what is now the "Big Cypress Preserve."

Collier had made his fortune in streetcar advertising sales, beginning in his native Memphis and spreading from New York to San Francisco as Consolidated Street Railway Advertising Company. With his capital and a vision of Florida alien to most, one of his first challenges was construction of the Tamiami Trail (U.S. 41).

This road, extending for 368 miles from Tampa southward along the Gulf coast to Naples, then eastward to Miami, was built through some of the most difficult terrain in the United States – mostly dense swamps and wilderness infested with snakes and alligators.

Barron Collier's advocacy and personal financial backing was key to successful completion of the Tamiami Trail in April 1928. Ever the savvy businessman, Collier negotiated his first oil lease in the county with Gulf Oil Company in the mid 1930s, despite Florida's still unbroken string of dry holes.

Gulf Oil brought in 50 men to conduct seismic testing, using the first big-wheeled "swamp buggy" vehicles of their type in the county. Gulf established headquarters in Everglades City, then the county seat, and began the search.

For 10 years, Gulf searched. The company drilled a number of wells, some to a depth of about 6,000 feet, but ultimately, seismic tests convinced them that full scale drilling was not warranted and in 1938, Gulf Oil pulled out.

$50,000 Bounty

By 1939, almost 80 dry holes had been drilled, the

deepest to a depth of 6,180 feet. About this time, Florida legislators, desperate for their state to become an oil producer, offered a $50,000 bounty for the first discovery.

Hoping to find success at greater depth, Peninsular Oil and Refining Company drilled in Southwest Florida's Monroe County to 10,006 feet, but still found no oil.

Collier's confidence nevertheless remained unshakeable. His son relates of the time, "I said to dad, 'You know, perhaps we have to face the fact that maybe there is no oil in Collier County.' Well, he was just absolutely furious. He shook his finger under my nose and said, 'Just don't let anybody tell you that there isn't any oil in Collier County.' And when I looked at him, he smiled and said, 'I can smell it.'"

Following their Monroe county disappointment, Peninsular executed a lease assignment to Humble Oil and Refining Co. and Humble began searching near the Sunniland watering stop on the Atlantic Coast Line Railroad. Barron Collier remained confident that oil would be found in southwest Florida, but when he died in 1939, oil in Florida remained an unrealized dream.

At Sunniland, the search continued, with the drilling done by the Hoffland Brothers of Tulsa, Oklahoma, one of the foremost drilling companies in the country.

Then, on the 26th of September 1943, after expending about $1 million and reaching a depth of 11,626, Humble Oil Co. brought in Sunniland No. 1, Florida's first producing oil well. The well's site is about 12-miles south of Immokalee, by present day Big Cypress Preserve and a 30-minute drive from the resort city of Naples.

Initial daily production was 140 barrels of oil and 425 gallons of salt water, which eventually settled down to 20 barrels per day. This was no gusher, but it proved the tenacious Barron Collier's wildcatter intuition to have been right on target.

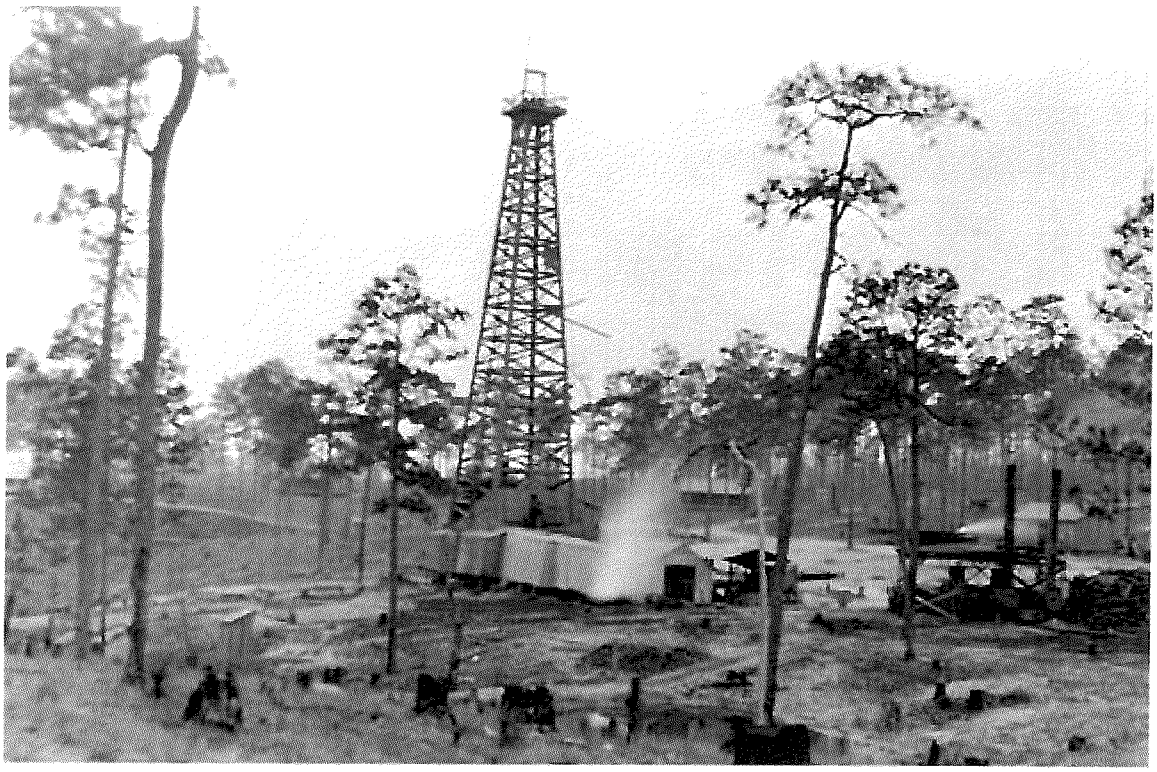
Predictably, the Humble Oil Co. find sparked a flurry of lease purchases and wildcat wells. By 1954, the Sunniland field was producing 500,000 barrels per year from eleven wells at average depths of 11,575 feet.

Sunniland remained Florida's top producer until 1964, when Sun Oil Co., after spending $10 million on 34 dry holes, discovered the Felda field in nearby Hendry County.

Pleased with its discovery of the Sunniland oilfield, Humble Oil accepted the $50,000 prize offered by the state, added $10,000 – and donated the $60,000 equally between the University of Florida and the Florida State College for women.

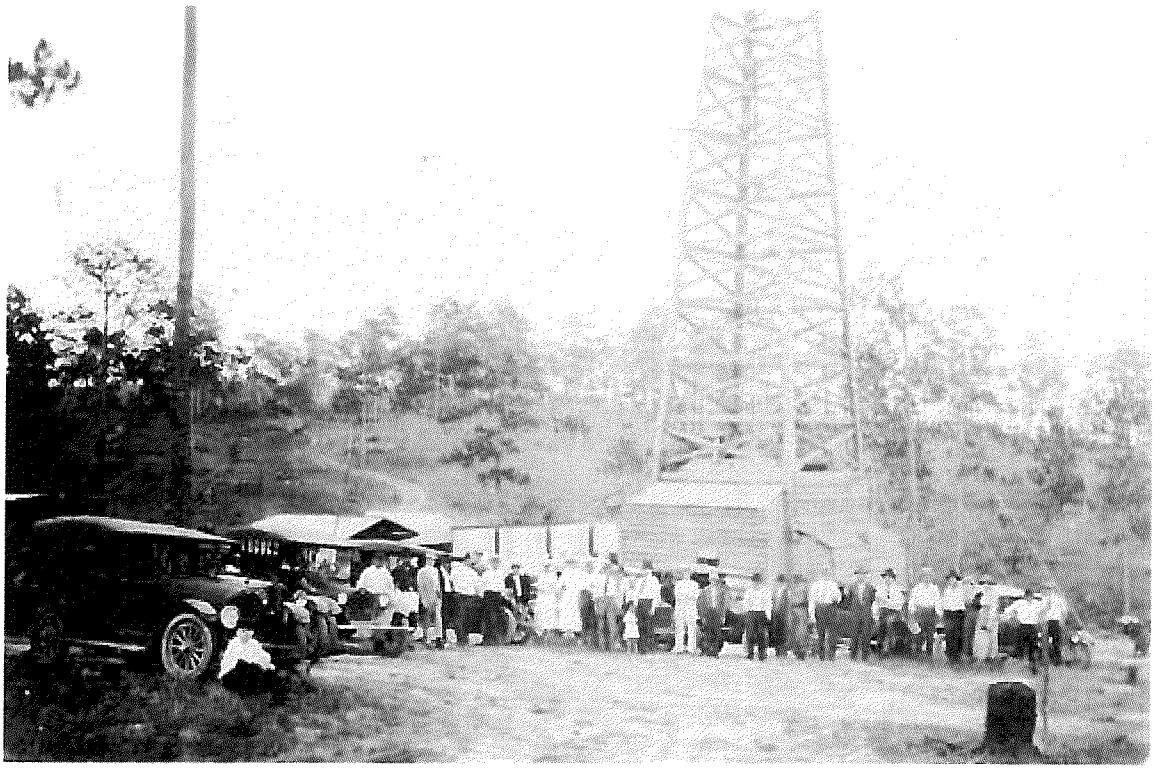
Humble would later become the Exxon Corp., now ExxonMobil.

From Vol. 1, No. 1, June 2004 *Petroleum Age*



527 4N 13W

W-1 DEKLE NO. 1 ~1920 Falling Water St. Pk



~1920 Falling Waters St. PK.

State of Florida

Department of Natural Resources

Interoffice Memorandum

11c

September 30, 1982

TO: C. W. Hendry, Jr., Administrator of Oil & Gas

FROM: L. D. Curry, Coordinator of Oil & Gas LDC

SUBJECT: Creation of a Special Fund for Plugging Old Abandoned Wells Which Do Not Conform To Present Day Safety Standards.

The Department of Natural Resources now has in place a stringent, comprehensive and effective set of rules and regulations governing oil and gas drilling and producing operations in Florida. Unfortunately this has not always been the case. Prior to March, 1946 there were no rules at all and between March, 1946 and April, 1972 only marginal rules were in effect. With the adoption of the third set of rules in April, 1972 the State of Florida began to seriously and effectively regulate driling and producing activities in Florida.

Going back to the very early days, those wells drilled prior to March, 1946 were plugged only if the operator wanted to plug them and those wells drilled between March, 1946 and July 1962 were often plugged as the operator saw fit. As time passed, surface casing was gradually set deeper and plugging procedures steadily improved, sometimes surpassing actual requirements. There are many wells however, that are inadequately plugged by any standard. To illustrate this point, a recent record search conducted as part of our current permitting process revealed that a well plugged and abandoned in 1946 (Permit 17) had only 1012 feet of surface casing and no plug of any kind set above 3000 feet. The entire plugging procedure consisted of only one untested 50 sack portland cement plug set at 3000 feet with no attempt made to protect freshwater aquifers above that depth. Present water quality estimates made by the USGS indicate good water quality in this area at 1000 feet and the freshwater/saltwater interface (10,000 ppm TDS) at approximately 1850 feet. Since this well was plugged under the auspices of the now defunct Florida State Board of Conservation and the bond released, the State of Florida would surely bear the brunt of any criticism and responsibility should this well eventually allow subsurface fluids to migrate up the well bore to the surface. For this reason, and because at

least 50 other plugged and abandoned wells fall into the same category with another 150 wells suspect, I recommend that we initiate a process leading to the creation by the State Legislature of a special purpose fund to be used for plugging such wells, should they cause problems in the future or should the State of Florida determine it advantageous to plug them beforehand.

Because of the very high cost of plugging operations and the substantial likelyhood of running into well problems due to corroded casing, etc., and because of the potential number of defective wells, as well as the need to allow a reasonable length of time to build up such a fund, I recommend an initial untimate goal of $5,000,000 be set for this purpose. One possible source of revenue might be to set aside a small percentage of the severance taxes paid on oil and gas production. Since $84,500,000 was collected in severance taxes during the 81-82 fiscal year, a 1% fund allotment would have amounted to approximately $845,000 in that year. But from whatever source the funds come from, once this amount has been set aside, the fund should remain dormant until a substantial sum of money is drawn from it, say 15% of that total, at which time the fund should resume growth until the withdrawn funds have been replaced.

If you think this suggestion has merit, we could discuss it with Casey and then develop a detailed proposal, if required.

LDC/gm

State of Florida

Department of Natural Resources Memorandum

July 31, 1990

TO: Walt Schmidt, Chief, Florida Geological Survey

FROM: R. S. Caughey, South Florida District O/G Coordinator

SUBJECT: Discussion of Inadequately Plugged Oil Test Wells In South Florida

Over 400 test well files for the ten counties in South Florida (Broward, Charlotte, Collier, Dade, Glades, Hendry, Lee, Martin, Monroe, and Palm Beach) have been reviewed and casing schematics prepared. Of the files reviewed, approximately 100 wells were found to be inadequately plugged (see Appendix I for casing schematics). About half of these wells can be replugged with reasonable cost and effort. The remaining 50 wells may prove more difficult, perhaps even impossible to replug.

Table I lists the wells which are in need of replugging. The list is by DNR permit number from youngest to oldest. Also, tabulated is the number of feet of USDW (formations containing $\leq$10,000 ppm TDS water) unprotected below the surface casing for each of these wells. Additionally, there is a listing of the required plugs which are missing or inadequate. For simplicity and convenience the required plugs have been grouped into four categories. First, the Sunniland plug isolates the known hydrocarbon bearing zones. Second, the bottom of the intermediate casing plug seals off the bottom of the intermediate casing and provides isolation between the Floridan aquifer above and brine filled units below. Third, the FW/SW-Open Hole plug isolates the USDW formations above from the salt-water bearing portion of the Floridan aquifer below. Because this cement plug is across the entire open hole interval fluids are also prevented from comingling between aquifers of different water quality. Fourth, the surface casing plugs seal off the bottom of the surface casing, the top of the surface casing and provide a minimum of 400' of cement to be placed within the surface casing adjacent to aquifers or confining units in which significant water quality changes occur. This 400' of cement is intended to prevent comingling of aquifers should corrosion holes form in the surface casing.

Estimated Plugging Cost

Plugging costs for a single well can vary between $100,000 to over $400,000. The tremendous variation in cost is dependent on the number and severity of problems which may be experienced during plugging a well. Most of these expensive problems are associated with the Sunniland plug and the bottom plug in the intermediate casing. Fortunately, only 4 of the 101 wells will require a Sunniland plug and a total of 22 will require a bottom plug in the intermediate casing. Nearly all of the wells will require the FW/SW-Open Hole plugs and all 101 wells require the surface casing plugs.

A diagram of a "typical" oil test well is presented in Figure #1. The four categories of plugs are shown in their relative positions in the well bore. Each of these plugs are briefly described on Figure #1. The approximate total cost and work days required to set each plug is stated. The estimated time and expense assumes only a minimum of problems are encountered. A more detailed breakdown of the cost involved for each of the categories is shown on Table II.

Estimated Plugging Cost Summary

There are four wells which will require plugs across the Sunniland, the bottom of the intermediate casing, the FW/SW-Open Hole plug, and the surface casing plugs. Using the estimated cost of $112,000 per well (see Figure #1 and Table II), then these 4 wells would cost approximately $448,000 to replug.

There are 22 wells which require a bottom plug in the intermediate casing, a FW/SW-Open Hole plug, and the surface casing plugs. Using the estimated costs previously presented in Figure #1 and Table II and prorating the miscellaneous equipment rental cost, then these wells would cost approximately $91,000 each. Twenty-two wells would cost an estimated two million dollars.

Approximately 45 wells will require FW/SW-Open Hole plugs and the surface casing plugs. Again using the previous figures and prorating miscellaneous equipment rental, the per well cost is estimated at $77,000 per well or a total of approximately three and one-half million dollars.

There are approximately 30 other wells which require FW/SW plugs and surface casing plugs; however, these wells have the intermediate casing to the surface and some small quantity of cement in the annulus between it and the surface casing. If the FW/SW plug can be squeezed through perforations in the intermediate casing at or near the FW/SW contact and not disappear into the boulder/cavernous zones, then these 30 wells will be replugged relatively easily. To date, no cement mix ever used will stay in this annulus; nevertheless, the possibility exists that a special mix and/or technique could be found or developed that will work. If not, these 30 wells may prove rather difficult and expensive to replug. Problems in removing or cutting away the intermediate casing will certainly increase the plugging costs. A figure of $150,000 per well is probably a low side estimate. Assuming this is a reasonable cost estimate, then replugging these 30 wells would total approximately four and one-half million dollars.

The total costs for replugging approximately 101 old wells appears to be in the range of 11 million dollars. However, keep in mind this estimate does not include any access road and pad construction or removal and restoration. Some wells may require a modified plugging scheme, while others will require additional work such as squeezing cement behind the surface casing. Nevertheless, the presented cost estimates and number of wells involved should provide a reasonable idea of the potential magnitude of the project.

Potential for Problem Wells in Central Florida

Thus far the discussion has been concerned only with well file research results for the counties in South Florida. There are about 100 oil test wells that have been drilled and plugged in the *21 Central Florida counties. A detailed review of 7 of these 100 wells suggests that perhaps 70% of these wells may require some type of plugging rehabilitation. If 70% of the wells do need replugging and costs involved are similar to the wells in South Florida, then an estimated replugging project cost may be in the eight million dollar range.

* Brevard, Citrus, De Soto, Hardee, Hernando, Hillsborough, Highlands, Indian River, Lake, Manatee, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Sarasota, Seminole, St. Lucie, Sumter, and Volusia

Conclusion

Approximately 100 older plugged and abandoned oil test wells in South Florida are in need of replugging to meet present day requirements of ground water protection. This goal could reasonably be accomplished within 5 to 10 years, and the expenditure of 10 to 15 million dollars.

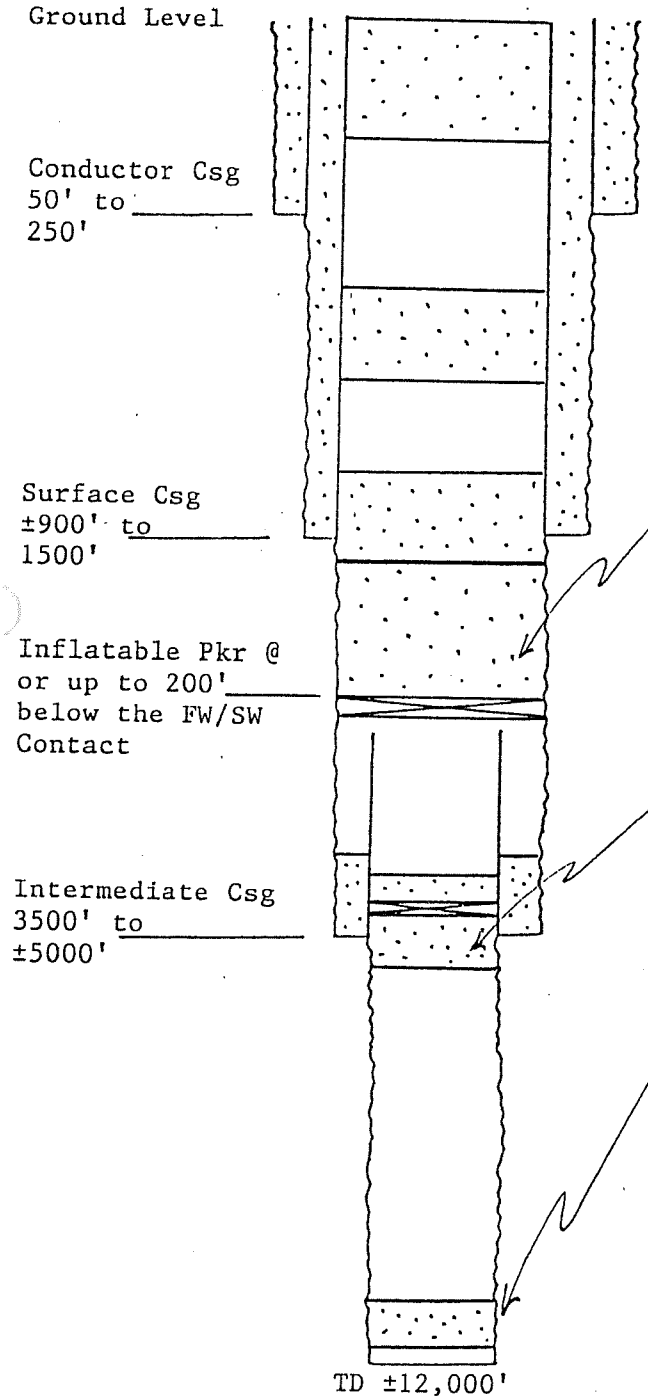
A situation of similar magnitude may exist in Central Florida. Additional research is underway to provide a better definition of the number of wells and the estimated replugging cost. So far this research indicates the number of wells involved and rehabilitation costs may be similar to those estimated for old wells in South Florida.

FIGURE NO. ONE

"Typical" Oil Test Well in South Florida Showing Required Plugs With Estimated Time and Cost Per Plug

Total Time to Plug Well: 15 workdays

Total Cost Estimate: $112,000 (includes 4 plugs listed below + misc. equipment rental



4. "Surface Casing Plugs" cement from -4' BGL to 100' BGL; cement plug from 50' below the surface casing shoe to 150' above the surface casing shoe; 400' of cement within the surface casing across significant water quality changes.

   Estimated Average Time: 2.5 days

   Estimated Cost: $18,600

3. "FW/SW-Open Hole Plug" cement plug from ±50' below the surface casing shoe to 200' below the Freshwater/Saltwater contact.

   Estimated Average Time: 5.5 days

   Estimated Cost: $41,450

2. "Intermediate Casing Bottom Plug" minimum 300' cement across the bottom of the casing shoe.

   Estimated Average Time: 3.5 days

   Estimated Cost: $16,450

1. "Sunniland Plug" minimum 400' of cement across the Hydrocarbon Bearing Formation.

   Estimated Average Time: 3.5 days

   Cost Estimate: $14,500

TABLE I

Permit #	Feet of USDW Unprotected	Inadequate or Missing Plugs: Sunniland	Bottom of Intermediate	FW/SW-Open Hole	Surface Casing
697	491			X	X
648	271			X	X
646	324			X	X
633	512			X	X
631	530			X	X
625	325			X	X
568	544			X	X
567	617			X	X
564	348			X	X
562	697			X	X
561	728			X	X
560A	786			X	X
544	338			X	X
532	388			X	X
529	548			X	X
527	305			X	X
520	417			X	X
505	491			X	X
488	590			X	X
472	385			X	X
437	689			X	X
425	462			X	X
424	648			X	X
418	486	X	X	X	X
408	258		X	X	X
397	680			X	X
393	834			X	X
388	757			X	X
386	871			X	X
385	847			X	X
381	646			X	X
379	628			X	X

TABLE I (con't)

Permit #	Feet of USDW Unprotected	Inadequate or Missing Plugs			
		Sunniland	Bottom of Intermediate	FW/SW- Open Hole	Surface Casing
376	842			X	X
373	584			X	X
372	876	X	X	X	X
368	150			X	X
365	276			X	X
362	305			X	X
360	834			X	X
354	595			X	X
351	827			X	X
343	767			X	X
331	774			X	X
321	790			X	X
311	462			X	X
310	1105			X	X
288	637		X	X	X
279	892		X	X	X
278	1006			X	X
271	488			X	X
269	1183			X	X
250	515			X	X
235	907			X	X
225	700±			X	X
222	514			X	X
214	860			X	X
208	591			X	X
207 (2)	6				X
207 (1)	521			X	X
205	746			X	X
191	753			X	X
182	819		X	X	X
178	0				X
171	619			X	X

TABLE I (con't)

Permit #	Feet of USSW Unprotected	Sunniland	Inadequate or Missing Plugs: Bottom of Intermediate	FW/SW- Open Hole	Surface Casing
170	0?		?	?	?
167	1245		X	X	X
163	1522			X	X
162	440		X	X	X
160	579			X	X
152	1262		X	X	X
148	500?		X	X	X
136	49			X	X
134	52			X	X
133	699			X	X
130	101			X	X
129	1507	X	X	X	X
125	899			X	X
121	903			X	X
117	136?		?	?	X
115	602			X	X
112	891			X	X
108	172?		?	?	X
103	842			X	X
98	730			X	X
92	820			X	X
86	727			X	X
76	906			X	X
64	795			X	X
58	1000'±?		X	X	X
47	1163		X	X	X
46	805			X	X
42	62			X	X
39	0				X
38	881	X	X	X	X
35	417			X	X
23	912			X	X

TABLE I (con't)

Permit #	Feet of USDW Unprotected	Sunniland	Inadequate or Missing Plugs: Bottom of Intermediate	Inadequate or Missing Plugs: FW/SW-Open Hole	Inadequate or Missing Plugs: Surface Casing
17	882		X	X	X
12	851		X	X	X
8	50±		X	?	X
B-5	898		X	X	X
B-1	800±		X	X	X
	TOTALS	4	22	98	101

TABLE II

Breakdown of Estimated Cost for Four Plug Categories

1. Sunniland Plug

Rig Time @ 3.5 days		$ 9100
Cement @ $10/sack		1900
Halliburton Pump Charge		3500
	Subtotal	$14,500

2. Intermediate Casing Bottom Plug

Rig Time @ 3.5 days		9100
Inflatable Packer + Setting Charge		5000
Cement @ $10/sack		1350
Halliburton Pump Charge		1000
	Subtotal	$16,450

3. FW/SW-Open Hole Plug

Rig Time @ 5.5 days		$14,300
Wireline Caliper/Gammaray Service of Open Hole		3500
Inflatable Packer + Setting Charge		8000
Vacuum Truck Service @ 5.5 days		2500
Cement @ $10/sack (assume an avg 1000' of open hole)		8650
Halliburton Pump Charges (assume avg of 5 pumps)		4500
	Subtotal	$41,450

4. Surface Casing Plug

Rig Time @ 2.5 days		$ 6500
Vacuum Truck Service @ 2.5 days		1000
Welder Services		300
Flat Bed, Winch Truck, Backhoe, Misc. Equipment		2000
Cement @ $10/sack		6300
Halliburton Pump Charge (avg. 3 pumps)		2500
	Subtotal	$18,600

TABLE II (con't)

Breakdown of Estimated Cost for Four Plug Categories

Miscellaneous Equipment Rental for all Plugs for an Average of 15 Days

1.	Fresh-water Tank @ $40/day		$ 600
2.	Salt-water Tank @ $40/day		600
3.	Blow Out Preventors @ $75/day		1125
4.	Workstring Rental		13,325
5.	Portable Toilet and Trash Pick up		350
6.	Install, Test, and Remove Rig Anchors		5000
		Subtotal	$ 21,000
		Total	$112,000

Report for Environmental Problem Solving Group regarding Inadequately Plugged Oil Test Wells in Florida.

Report prepared by Robert S. Caughey
January 2000

INADEQUATELY PLUGGED & ABANDONED OIL TEST WELLS IN FLORIDA

A review of all plugged & abandoned oil test wells in the state of Florida was carried out by R. S. Caughey between 11/08/99 (second EPS meeting) and 01/25/00 (third EPS meeting). With the help of the Oil & Gas Section-Tallahassee staff, seven hundred ninety two (792) casing/cementing/plugging schematics were prepared for each and every oil test well plugged and abandoned in the state of Florida. Mr. Caughey evaluated these schematics and found that four hundred forty six (446) or 56% were inadequately plugged and abandoned, resulting in inadequate protection of the Underground Source of Drinking Water (USDW).

Oil test wells were considered to be inadequately plugged & abandoned if the USDW [any ground water that is less than or equal to 10,000 ppm TDS (Total Dissolved Solids)] was not adequately protected by cement, casing & cement, and appropriately placed plugs. Wells were considered inadequately plugged if the USDW was open to flow down the well bore [example: Permit #172, Bay County]; if the USDW was open to the upward flow of saltwater [example: Permit #155, Bay County]; and if the USDW could comingle with other USDW of different water quality and/or pressure [example: Permit #111, Columbia County].

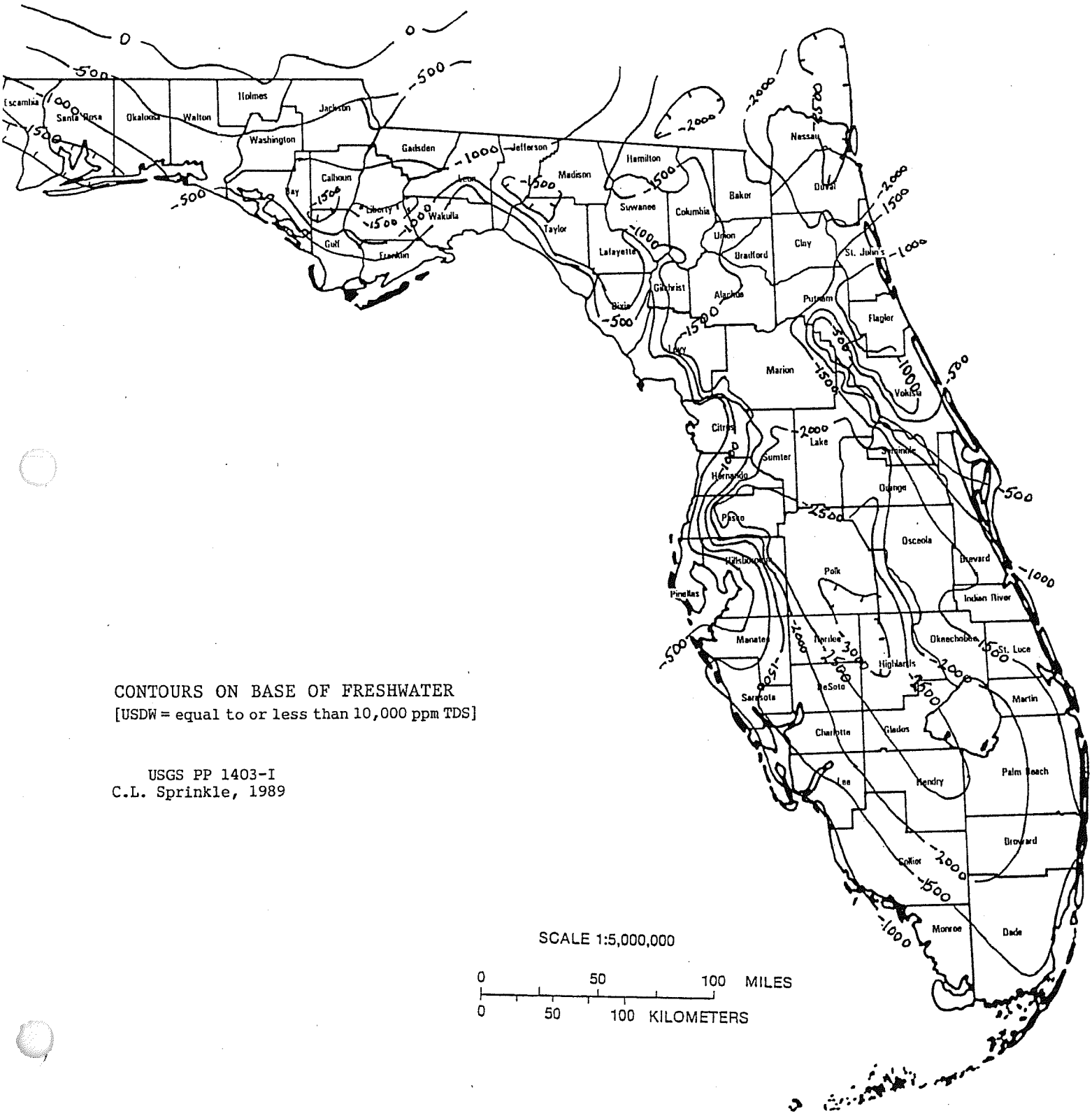
If less than 50' of USDW were unprotected, these oil test wells were not included on the inadequately plugged well list. The maps used to evaluate the base of the USDW are likely accurate to only ±50' and in some areas are considerably less accurate. Two oil test wells were included on the inadequately plugged well list only because no top plug was reported.

The base of the USDW was mapped by C.L. Sprinkle and published in the USGS Professional Paper #1403-I in 1989. This map was used for all oil test wells in northern, central and panhandle Florida. The base of the USDW map for south Florida, by R.S. Caughey (January 2000) was used to evaluate plugged and abandoned oil test wells in Lee, Hendry, Collier, Dade, Monroe, Palm Beach, Martin, St. Lucie, Okeechobee, Highlands, Charlotte and Desoto counties. This South Florida USDW Map was produced by compiling additional oil test well, disposal well and WMD test well data on the USGS map and re-contouring.

When evaluating oil test well casing and plugging status, the benefit of doubt was given to the well bore and the well file data. For instance, if sufficient cement was pumped behind the surface casing to circulate to the surface, then the surface casing was considered to have a good cement job and the USDW were being adequately protected. If insufficient cement was pumped behind the surface casing, then the top of cement [TOC] was calculated and the cement was assumed to be at this depth behind the surface casing.

Balanced cement plugs spotted in open hole or casing are assumed to be present where the operator reported, even though these plugs were not confirmed by tagging or pressure testing. An exception to this is in south Florida where experience has shown that balanced cement plugs cannot be set above the cavernous/boulder zone in Lee, Hendry, Collier, Dade, Monroe, and parts of Charlotte, Glades, Martin, St. Lucie, Okeechobee and Highlands counties. Balanced cement plugs in these counties were only considered to be present if a cement retainer or bridge plug was used, or if the plug was reported tagged or confirmed to exist by some method. Because the benefit of doubt was given to the plugging/casing/cementing data in the well files, this USDW protection evaluation has yielded conservative results.

Prior to 1972 few oil test wells were inspected when the surface casing was being cemented, and when the well bore was being plugged & abandoned. Lack of resources and staff at the Florida Geological Survey-Oil & Gas Section created this unfortunate situation. In 1972 Oil & Gas Section Field Offices were opened in Jay and Ft. Myers. Now, with adequate field staff, most surface casing cement jobs and plugging jobs are witnessed by a state agent. In south Florida (since 1980) all surface casing cement jobs have been witnessed by a state agent, and most conductor casing cement jobs, and essentially all plugs (both setting the plug & confirmation of the plug) have been (& continue to be) witnessed by a state agent.

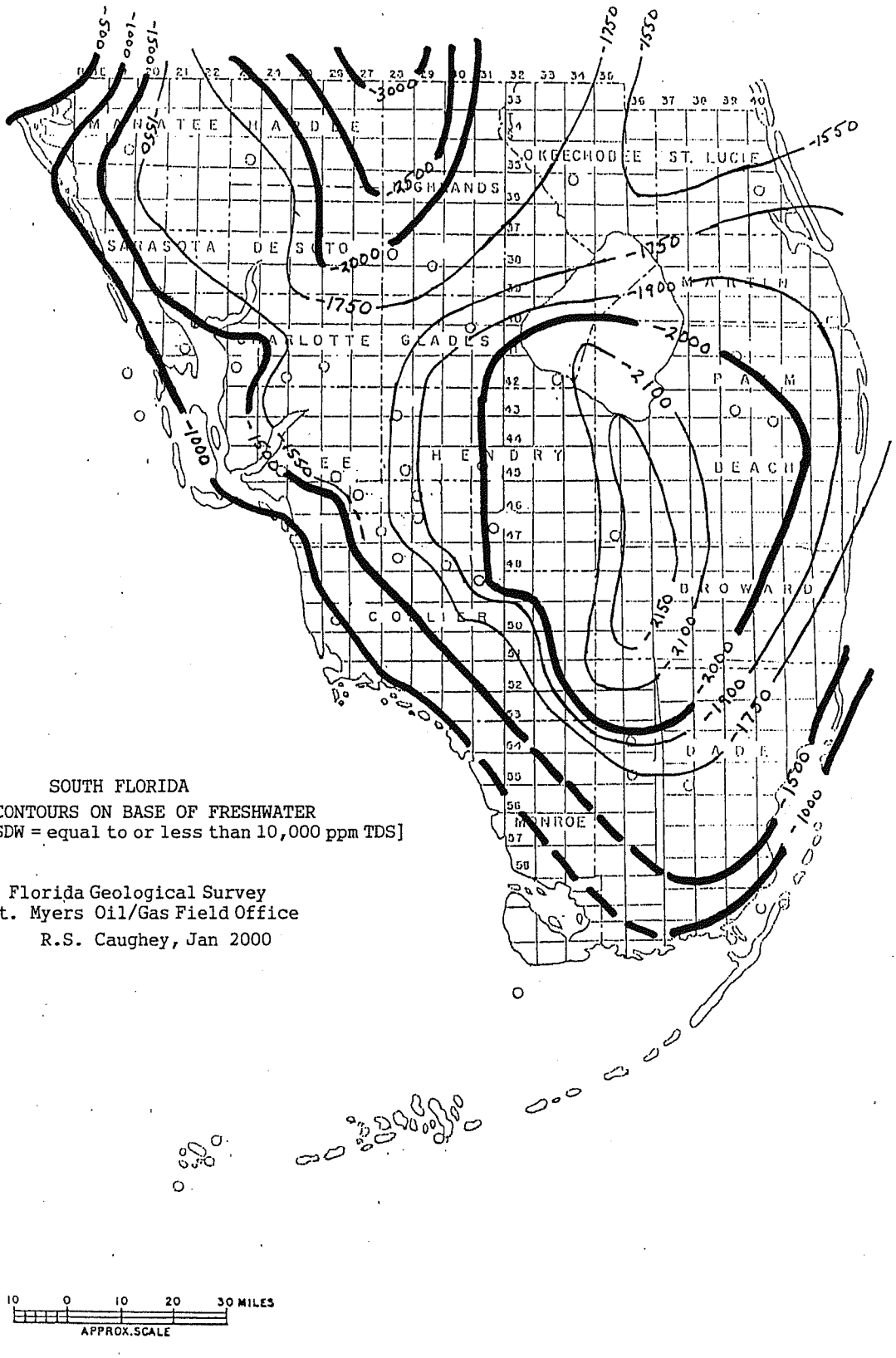


CONTOURS ON BASE OF FRESHWATER
[USDW = equal to or less than 10,000 ppm TDS]

USGS PP 1403-I
C.L. Sprinkle, 1989

SCALE 1:5,000,000

0 50 100 MILES
0 50 100 KILOMETERS

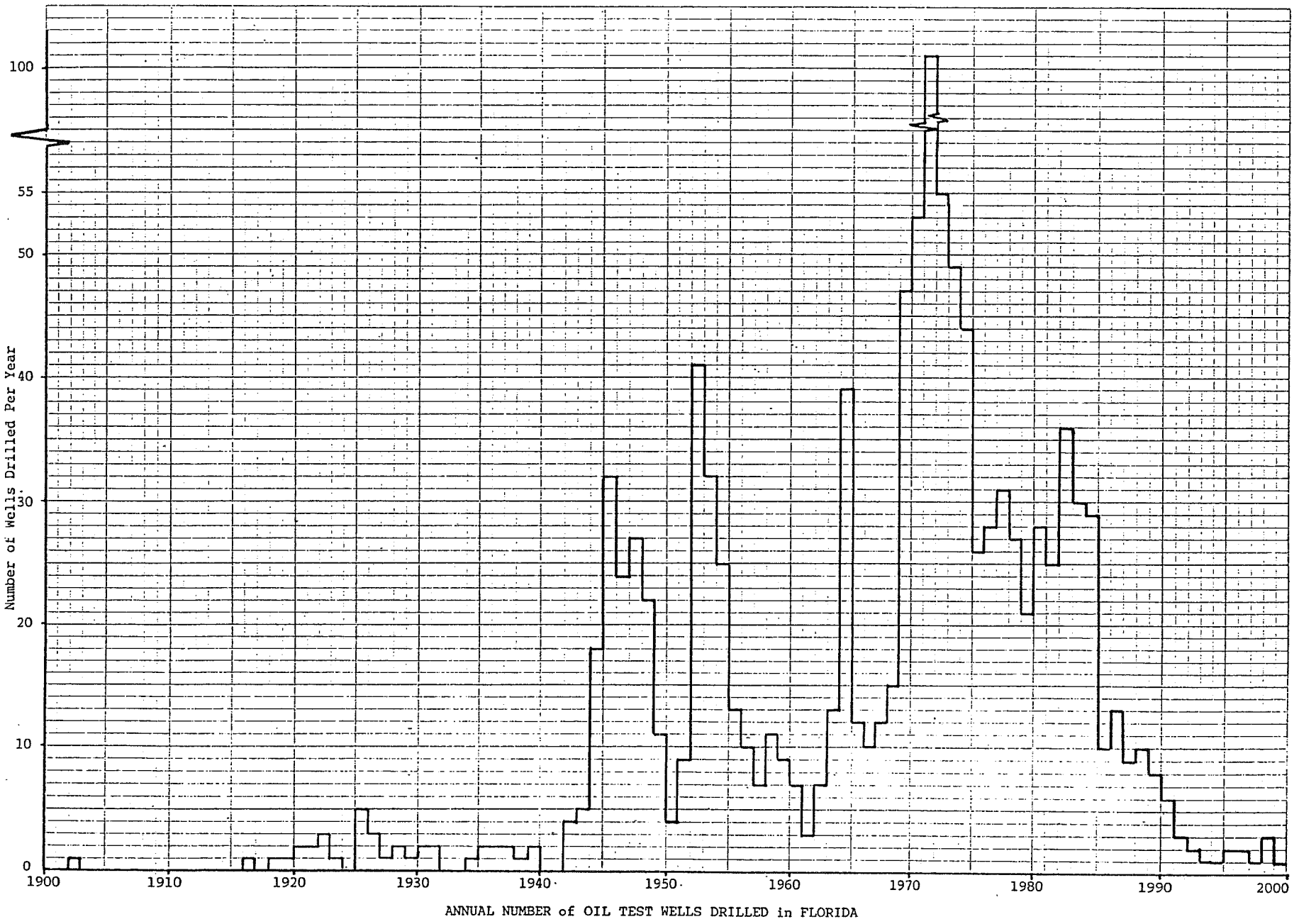


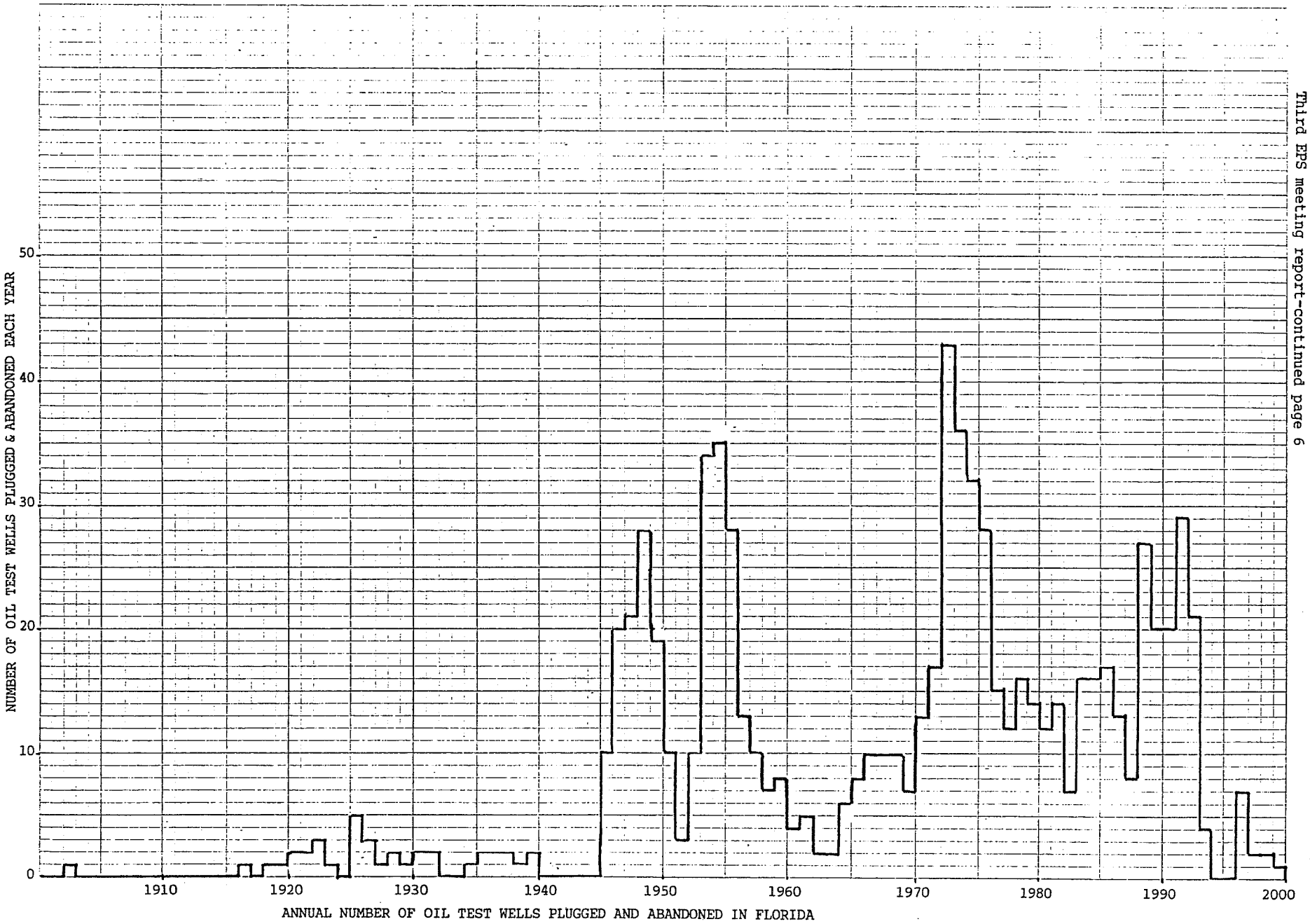
SOUTH FLORIDA

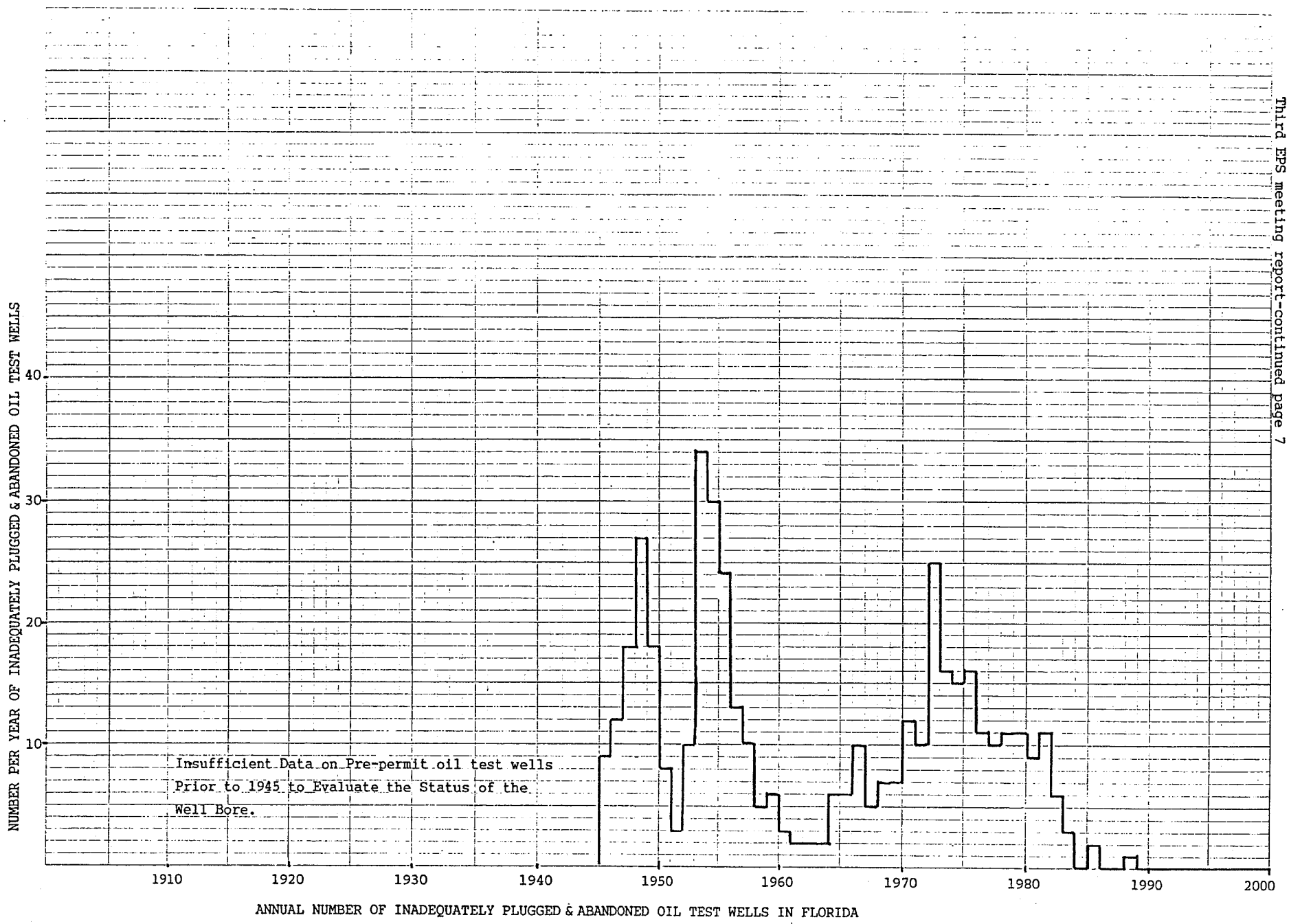
CONTOURS ON BASE OF FRESHWATER
[USDW = equal to or less than 10,000 ppm TDS]

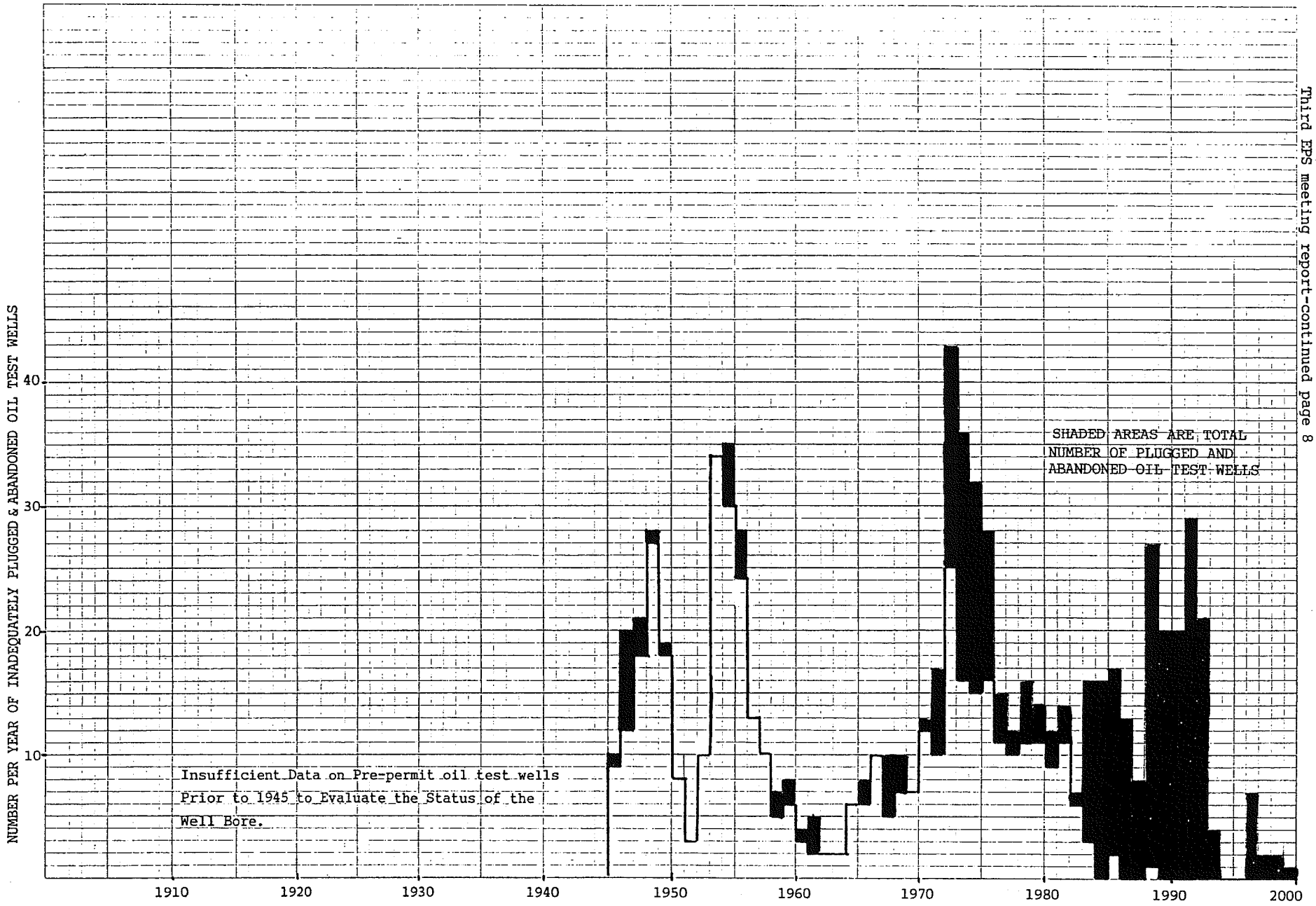
Florida Geological Survey
Ft. Myers Oil/Gas Field Office
R.S. Caughey, Jan 2000

10 0 10 20 30 MILES
APPROX. SCALE


Number of Wells Drilled Per Year
0
10
20
30
40
50
55
100
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
ANNUAL NUMBER of OIL TEST WELLS DRILLED in FLORIDA


NUMBER OF OIL TEST WELLS PLUGGED & ABANDONED EACH YEAR
0
10
20
30
40
50
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
ANNUAL NUMBER OF OIL TEST WELLS PLUGGED AND ABANDONED IN FLORIDA


NUMBER PER YEAR OF INADEQUATELY PLUGGED & ABANDONED OIL TEST WELLS
40
30
20
10
Insufficient Data on Pre-permit oil test wells
Prior to 1945 to Evaluate the Status of the
Well Bore.
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
ANNUAL NUMBER OF INADEQUATELY PLUGGED & ABANDONED OIL TEST WELLS IN FLORIDA


NUMBER PER YEAR OF INADEQUATELY PLUGGED & ABANDONED OIL TEST WELLS
40
30
20
10
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
SHADED AREAS ARE TOTAL NUMBER OF PLUGGED AND ABANDONED OIL TEST WELLS
Insufficient Data on Pre-permit oil test wells Prior to 1945 to Evaluate the Status of the Well Bore.
ANNUAL NUMBER OF INADEQUATELY PLUGGED & ABANDONED OIL TEST WELLS IN FLORIDA

SUMMARY OIL TEST WELL LIST OF INADEQUATELY PLUGGED & CASED/CEMENTED OIL TEST WELLS BY COUNTY IN THE STATE OF FLORIDA, Jan 2000

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

EXPLANATION

USDW	Underground Source of Drinking Water--all waters equal to or less than 10,000 ppm TDS(Total Disolved Solids).
-	Aquifer Flow Potential is Downward
+	Aquifer Flow Potential is Upward
+/-	Borderline--Aquifer Flow Potential is probably upward
-/+	Borderline--Aquifer Flow Potential is probably downward
W/C	Woodward/Clyde report evaluating older permitted oil test wells
GL	Ground Level
MW	Monitor Well

USDW to Comingle indicates two or more freshwater(less than 10,000 ppm TDS)aquifers are open to each other and could flow from one to another along the well bore, the casing or in the annular space between well bore and casing. This interaquifer flow may result in pressure changes and/or water quality changes.

FW/SW = Freshwater/Saltwater Contact B.D.F. = Below Derrick Floor(elevation)
BMSL = Below Mean Sea Level BGL = Below Ground Level BLS = Below Land Surface
D.F. = Derrick Floor K.B. = Kelly Bushing T.D. = Total Depth

W-1465 = Well number for cuttings/core stored at FGS-Tallahassee cuttings library

cmt = cement sx = sacks csg = casing TOC = Top of Cement WOC = Wait on Cement

Cl A = Class A (cement) Cl H = Class H (cement) CaCl = Calcium Chloride = CC

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
ALACHUA COUNTY [Total wells evaluated: 6 / Total wells inadequately plugged /cased: 5]				
49	0	-	700	
52	800	-	700	
54	470	-	1000	
238	560	-	0	
709	0	-	900?	Need more well bore data
BAKER COUNTY [2 / 2]				
59	800	-	700	
126	370	-	850	No top plug?
BAY COUNTY [10 / 7]				
155	0	+	930	
172	0	-	1100	
173	200	+	450	
221	360	-	860	
246	600	+		
257	700	-		
274	800	-		
BRADFORD COUNTY [2 / 2]				
41	220	-	900	
465	0	-	500-1500	
BROWARD COUNTY [1 / 0]				
NONE				
CALHOUN COUNTY [14 / 12]				
02	430	-		
03	1430	-		
24	675	-		
25	1130	-		
26	1150	-		

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
CALHOUN COUNTY CONTINUED				
70	1025	-		
149	200	-	±840	
174	1225	-		
184	±635	-		
195	620	-	520	
216	200	-	1260	
266	900	-		
CHARLOTTE COUNTY [10 / 8]				
B-5(#1)	±700	+		Once used as "hot spring".
B-5(#2)	±900	+		
178	200	+		? surface csg shoe plug
310	1125	+		
373	0	+	600	? surface csg shoe plug
459	280	+		
472	460	+		intermediate csg to surface
683	170	+		
CITRUS COUNTY [4 / 1]				
358	265	-		
CLAY COUNTY [1 / 1]				
50	0	+/-	±800	
COLLIER COUNTY [153 / 90]				
17	900	+	±200	No surface csg shoe plug
23	860	+	±200	No surface csg shoe plug
35	390	+	0	USDW are poor quality; questionable surface csg shoe plug.
38	860	+	300	No surface csg shoe plug
42	300(or less)	+	0	intermediate csg to surface

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
COLLIER COUNTY continued				
46	800	+	450	Questionable surface csg shoe plug
55	860	+	0	
64	600	+	±150	No surface csg shoe plug
76	900	+	some	No surface csg shoe plug
80	860	+	some	
86	730	+	some	No(?) surface csg shoe plug
92	820	+	some	No surface csg shoe plug
98	730	+	some	No surface csg shoe plug
103	850	+	700	No surface csg shoe plug
112	840	+	±200	No surface csg shoe plug
121	860	+	±200	No surface csg shoe plug
125	870	+	±200	Questionable surface csg shoe plug
130	65	+	0	No surface csg shoe plug
134	0	+	some?	No surface csg shoe plug
136	0	+	±100	No surface csg shoe plug
222	510	+	0	Questionable surface csg shoe plug
282	525	+	0	
288	610	+	0	Questionable surface csg shoe plug
291	650	+	0	intermediate csg to surface
311	410	+	400	intermediate csg to surface?
319	580	+	0	Converted to water well; plugged by SFWMD in 09/88.
321	760	+	0	intermediate csg to surface
357	975	+	0	
361	780	+	0	
365	300	+	0	intermediate csg to surface
368	0	+	0	intermediate csg to surface
372	875	+	0	Questionable surface csg shoe plug
379	625	+	0	intermediate csg to surface
381	600	+	0	Questionable surface csg shoe plug
393	835	+	0	Questionable surface csg shoe plug
454	665	+	0	

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
COLLIER COUNTY continued				
865	535	+	0	
868	225	+	0	
871	390	+	0	
873	560	+	0	
876	580	+	0	
885	330	+	0	
942	435	+	475	
947	550	+	0	
974	570	+	0	
1000	750	+	0	
1012	555	+	0	
1016	575	+	0	
1020	485	+	400	
1022	410	+	0	
1025	475	+	0	
1030	350	+	0	
1056	540	+	0	
1057	430	+	0	
1059	400	+	0	
1063	490	+	0	
1065	120	+	0	
1077	100	+	0	
1095	200	+	0	
1140	450	+	0	intermediate csg to surface

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
COLLIER COUNTY continued				
462	690	+	0	
477	500	+	0	
500	650	+	0	
517	585	+	0	
524	585	+	0	
562	725	+	0	intermediate csg to surface
596	0	+	0	intermed & prod csg to surface
613	560	+	0	
617	600	+	0	intermediate csg to surface
619	685	+	?	
619A	610	+	±1200	Comingle behind surface csg
631	525	+	0	intermediate csg to surface
646	250	+	0	intermediate csg to surface
663	0	+	0	? surface csg shoe plug
697	495	+	0	inadequate/no surface csg plug
699	630	+	0	
701	480	+	0	
713	515	+	900	
736	620	+	0	
760	745	+	0	
766	240	+	0	
767	625	+	0	
775	100	+	0	
799	535	+	0	
821	670	+	0	
831	500	+	640	
835	580	+	0	
849	500	+	0	
852	500	+	0	
853	500	+	some?	

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
COLUMBIA COUNTY [15 / 10]				
77	200	-		
93	0	-	660	? top plug
104	0	-	800	? top plug
107	200	-	800	
111	0	-	700	
124	0	-	500	
338	400	-		
339	445	-		
653	0	-	±750	
986	200	-		inadequate surface csg shoe plug
DADE COUNTY [11 / 11]				
12	800	+		Probably poor water quality
115	600	+	426	? surface csg shoe plug
129	1450	+		
167	1200	+		? surface csg shoe plug
182	800	+		? surface csg shoe plug
205	700	+		No surface csg shoe plug
214	800	+		? surface csg shoe plug
278	900	+		? surface csg shoe plug
331	800	+		intermediate csg to surface
376	800	+		intermediate csg to surface
386	870	+		intermediate csg to surface
DESOTO COUNTY [2 / 2]				
609	210	-		intermediate csg to surface
679A	750	-		intermediate csg to surface
DIXIE COUNTY [4 / 2]				
36	0	+	500	
97	0	+	1000	

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
DUVAL COUNTY [3 / 3]				
402	0	-	1500	Reported to be USGS Monitor Well
404	0	-	1300	
410	0	-	730	
ESCAMBIA COUNTY [33 / 7]				
132	650	+	450	Woodward/Clyde Target Well
135	600	+		W/C Target Well
147	700	+		W/C Target Well
204	800	+		
252	770	+		W/C Target Well
253	150	+	800	
263	450	+		
FLAGLER COUNTY [2 / 2]				
34	900	+		
44	0	+	740	
FRANKLIN COUNTY [12 / 2]				
180	200	+		
1227	0	+	600	
GADSDEN COUNTY [8 / 8]				
33	0	-	436	
83	0	-	1150	? top plug
87	1100	-		
233	150	-		
245	535	-		
276	200	-	370	
302	300	-		
305	200	-	270	

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
GILCHRIST COUNTY [2 / 2]				
05	500	-	500	
89	360	-		
GLADES COUNTY [3 / 2]				
152	1250	+		Much junk in hole start @ 560'
269	800	+		
GULF COUNTY [10 / 5]				
B-4	0	+	0	Needs plug @ top & surface csg shoe.
37	50	+		
40	125	+		
48	800	-		
194	125	+	370	No surface csg shoe plug
HARDEE COUNTY [1 / 1]				
62	1350	-	±300	
HENDRY COUNTY [120 / 60]				
133	650	+	±600	No surface csg shoe plug.
162	120 to 360	+	±1200	No surface csg shoe plug
163	1460	+		Surface csg @ 393', poor cmt job.
171	500'	+	±600	? surface csg shoe plug
191	720	+	±330	
207 #1	500	+	±525	? surface csg shoe plug
207 #2	0	+	±1800	? surface csg shoe plug; comingle behind surface csg.
279	840	+	0	? surface csg shoe plug
325	630	+	0	
343	800	+	0	? surface csg shoe plug

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
HENDRY COUNTY continued				
700	640	+	0	
702	790	+	0	
768	590	+	0	
781	750	+	0	
783	730	+	0	
789	510	+	0?	
830	685	+	0	
848	540	+		
864	375	+	0	
903	730	+	0	
926	495	+	0	
951	350	+	0	
968	740	+	0	
978	755	+	0	
987	470	+	0	
989	610	+	0	
990	530	+	0	
1026	570	+	0	
1038	510	+	0	
1048	425	+	0	
1050	520	+	0	
1053	400	+	0	
1058	250	+	0	

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
HENDRY COUNTY continued				
351	825	+	0	? surface csg shoe plug
354	620	+	0	
359	790	+	0	
360	810	+	0	? surface csg shoe plug
362	350	+	0	intermediate csg to surface
363	780	+	0	
366	850	+	0	
367	900	+	0	
369	745	+	0	
388	775	+	0	? surface csg shoe plug
397	655	+	0	? surface csg shoe plug
418	475	+	0	intermediate & production csg to surface
424	640	+	0	intermediate csg to surface
437	685	+	0	intermediate csg to surface
488	590	+	0	intermediate csg to surface
505	490	+	0	no surface csg shoe plug
529	550	+	0	intermediate csg to surface
560A	720	+	0	intermediate csg to surface
561	740	+	0	intermediate csg to surface
565	500-1000	+	0	intermediate csg to surface
567	625	+	0	intermediate csg to surface
568	520	+	0	intermediate csg to surface
606	550	+	0	
620	690	+	0	
633	510	+	0	intermediate csg to surface
662	770	+	0	
698	760	+	0	

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
HERNANDO COUNTY [Total wells evaluated: 4 / Total wells inadequately plugged/cased: 2]				
378	0	-	600	W/C Target Well
391	0	-	1300	W/C Target Well
HIGHLANDS COUNTY [3 / 3]				
B-1	750	+	750	
225	700	+		
862	250	+		
HILLSBOROUGH COUNTY [2 / 2]				
29	1165	+		W/C Target Well
270	400	+		W/C Target Well
HOLMES COUNTY [13 / 9]				
84	136	-	280	
188	160	-		
189	160	-		
201	minor	-	±170	No surface csg shoe plug
226	200	-		No top plug?
227	265	-		
231	165	-		
249	270	-		
260	130	-		
242	130	-		
INDIAN RIVER COUNTY [1 / 1]				
243	800	+		
JACKSON COUNTY [7 / 5]				
145	0	-	300	
151	110	-		
185	475	-		

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
JACKSON COUNTY continued				
218	255	-		
239	100	-		
JEFFERSON COUNTY [2 / 1]				
95	760	-		
LAFAYETTE COUNTY [8 / 5]				
04	100	-	560	? top plug
67	0	-	310	
100	936	-		
114	0	-	654	
347	118	-	750	
LAKE COUNTY [3 / 2]				
574	0	-	600	intermediate csg to surface
629	0	-	400	
LEE COUNTY [49/ 29]				
160	610	+	some	? surface csg shoe plug
161	400	+	some	? surface csg shoe plug
208	450	+	±400?	? surface csg shoe plug
250	515	+		? surface csg shoe plug
271	470	+	some	? surface csg shoe plug
408	260	+		intermediate & production csg to surface.
425	460	+		intermediate csg to surface.
520	420	+		intermediate csg to surface
527	280	+		intermediate csg to surface
532	365	+		intermediate csg to surface

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
LEE COUNTY continued				
544	340	+		intermediate csg to surface
625	315	+		intermediate csg to surface
648	280	+		intermediate csg to surface
684	345	+		
685	240	+		
720	330	+		
786	370	+		
817	400	+		
842	175	+		
847	320	+		
851	230	+		
919	220	+		
930	110	+		
950	285	+		
959	160	+		
966	320	+		
979	270	+		
1028	350	+		
1183	120	+		

LEON COUNTY [1 / 0]

NONE

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
LEVY COUNTY [8 / 7]				
13	0	+	0	intermediate csg to surface; W/C reported well flowing; W/C Target Well
21	0	+	±600(?)	W/C reported well flowing; W/C Target Well
66	0	+	±140	
69	0	+	0	inadequate top plug; no surface csg shoe plug; W/C Target Well
105	0	+	400	
110	0?	+	0?	reported converted to water well & flowing; W/C Target Well
199	±200?	+		reported converted to water well; W/C Target Well
LIBERTY COUNTY [8 / 7]				
07	700	+		
14	80	-		
88	700	-		
248	850	-		
730	0	-	±500?	
745	0	-	±800	? surface csg shoe plug
769	0	-	±800	intermediate csg to surface
MADISON COUNTY [1 / 0]				
NONE				

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
MANATEE COUNTY [2 / 2]				
236	375	-/+	±1100	
759	0?	-/+	±900	
MARION COUNTY [3 / 2]				
53	0	-	900-1400	intermediate csg to surface
101	0	-	1450	
MARTIN COUNTY [1 / 1]				
1032	450	+		
MONROE COUNTY [2 / 2]				
564	350	+		intermediate csg to surface
754	430	+		
[Oil Test Wells in the Florida Keys are not evaluated because of poor groundwater quality]				
NASSAU COUNTY [1 / 1]				
449	400	+	some?	
OKALOOSA COUNTY [20 / 12]				
60	580	-		
144	245	-		
150	275	-		
177	170	-		
186	400	-		
192	180	-		
193	350	+		
228	570	-		
258	420	-		
267	525	-		
287	800	+		

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
OKALOOSA COUNTY continued				
518	±700	-		
OKEECHOBEE COUNTY [5 / 3]				
237	0	+	±700	
364	±200?	+		
732	±300?	+		
ORANGE COUNTY [2 / 2]				
230	1000	-		intermediate csg to surface
441	±400?	+		intermediate csg to surface
OSCEOLA COUNTY [6 / 6]				
08	670	+		W/C Target Well; no surface csg shoe plug
31	1200	-		W/C Target Well; no surface csg shoe plug
81	0	+	±500	
91	1370	-		W/C Target Well
539	0	+	±400	W/C Target Well
543	0	+	1000	W/C Target Well
PALM BEACH COUNTY [6 / 6]				
47	1160	+		W/C Target Well; no surface csg shoe plug.
235	900	+		? surface csg shoe plug
265	110	+	800	
385	840	+		intermediate csg to surface
740	430	+		
972	800	+		

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
PASCO COUNTY [5 / 4]				
608 A	0	+/-	300	
742	0	+	1200	
743	0	+	500 or more	
875	300	+		
PINELLAS COUNTY [4 / 4]				
75	360	+		intermediate csg to surface ; W/C Target Well
123	500	+		W/C Target Well
131	0	+	±400?	W/C Target Well
170	500	+		W/C Target Well
POLK COUNTY [3 / 3]				
213	?	-	350(or more)	Need csg cmt & plugging data.
403	0	-	1000	
854	1000	+/-		intermediate csg to surface
PUTNAM COUNTY [3 / 3]				
58	0	-	1140	
96	670	+		intermediate csg to surface; W/C Target Well
607	0	-/+	0	intermediate csg to surface
SANTA ROSA COUNTY [126 / 41]				
137	175	+		
140	375	+		
146	200	+		
157	250	+		
165	350	+		no surface csg shoe plug
166	500	+		

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
SANTA ROSA COUNTY CONTINUED				
175	155	+		
176	600	-		
179	380	+		? top plug
181	625	+		
183	320	+		
187	425	+		no surface csg shoe plug
196	0	+	450	
197	200	+		no surface csg shoe plug
198	500	+		
200	310	+		
202	350	+	600	
212	150	+		
215	350	+		
217	485	+		
220	350	+		
224	350	+		no surface csg shoe plug
229	710	+		W/C Target Well
247	680	+		
251	255	+		
255	675	+		
262	330	+		
272	610	+		
273	915	+		
283	300	+		no surface csg shoe plug
299	0	+	950	
313	300?	+		need well bore data
318	260	+		
320	±200?	+		need well bore data
370	0	+	0	? top plug

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
SANTA ROSA COUNTY continued				
396	190	+		
405	200	+	500	
863	0	+	0	? top plug
223	400	+	0	
1045	0	+	1000	
1271	?	+	?	Insufficient plugging data in FGS well file
ST JOHNS COUNTY [2 / 2]				
435A	0	+	0	intermediate csg to surface
506	700	+	0	intermediate csg to surface
ST LUCIE COUNTY [3 / 2]				
254	200	+	0	
772	610	+	0	intermediate csg to surface
SUWANNEE COUNTY [9 / 6]				
45	0	-	±650	intermediate csg to surface
57	200	-	1120	
90	0	-	900	
109	0	-	700	
128	0	-	±800	converted to water well
143	200	-	0	
TAYLOR COUNTY [10 / 4]				
116	500	+	0	[unprotected behind surface csg]
119	0	-	1400	
309	300	+	0	? top plug
466	0	-	1300	

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
UNION COUNTY [3 / 1]				
680	0	-	1340	Comingle behind surface csg
VOLUSIA COUNTY [3 / 3]				
19	±900	-	0	[unprotected behind surface csg]
78	700	-		collasped surface csg & no csg shoe plug
78A	900	-		
WAKULLA COUNTY [1 / 1]				
696	±500?	-		intermediate csg to surface; ? surface csg cmt job
WALTON COUNTY [23 / 10]				
72	150	+		
74	100	+		
142	50	+		
168	560	-		
169	630	-/+		
203	360	-		No surface csg shoe plug
206	500	+		No surface csg shoe plug; Woodward/Clyde Target Well
219	280	-		
234	?	-	?	no surface csg cmt records
244	260	-		

INADEQUATELY PLUGGED OIL TEST WELLS IN FLORIDA

Permit Number	Feet of Unprotected USDW	Aquifer Flow Potential	Feet of USDW that can Comingle	REMARKS
WASHINGTON COUNTY [10 / 7]				
71	230	-	0	? surface csg cmt job; no cmt data in well file
73	450	-	0	
79	400	-	0	
154	500	+/-	100-200	No surface csg shoe plug
156	460	-/+	100-200	No surface csg shoe plug
164	625	+	0	No surface csg shoe plug
240	540	-	0	No surface csg shoe plug; no cmt data in well file

TOTAL NUMBER OF INADEQUATELY PLUGGED/CASED OIL TEST WELLS: 446
TOTAL NUMBER OF OIL TEST WELLS EVALUATED: 792
56% Inadequately Plugged/Cased

Prepared for the Third EPS Meeting
by R.S. Caughey, January 2000

EXPLANATION

USDW Underground Source of Drinking Water-all groundwater equal to or less than 10,000 ppm TDS[Total Dissolved Solids]

- Aquifer Flow Potential Is Downward + Aquifer Flow Potnetial Is Upward.

+/- Borderline: Aquifer Flow Potential is Probably Upward

-/+ Borderline: Aquifer Flow Potential is Probably Downward

W/C Woodward/Clyde report evaluating older permitted oil test wells

MW = Monitor Well GL = Ground Level

USDW that can Comingle- indicates two or more freshwater(less than 10,000 ppm TDS) aquifers are open to each other and could flow from one to another along the well bore, the casing or in the annular space between well bore and casing. This interaquifer flow may result in pressure changes and/or water quality changes.