

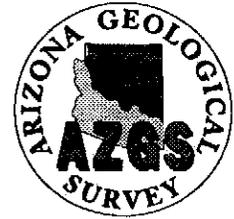
OIL & GAS CONSERVATION COMMISSION  
— MINUTES OF MEETING / APRIL 30, 2004 —  
STEVEN L RAUZI, OIL & GAS ADMINISTRATOR



Janet Napolitano  
Governor

State of Arizona  
**Arizona Geological Survey**

416 W. Congress, Suite 100  
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Larry D. Fellows  
Director and State Geologist

**NOTICE OF COMBINED PUBLIC MEETING AND POSSIBLE EXECUTIVE SESSION**

**OIL AND GAS CONSERVATION COMMISSION**

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Oil and Gas Conservation Commission and to the general public that the Oil and Gas Conservation Commission will hold a meeting open to the public on April 30, 2004, at 10:00 a.m. in Room 321 of the State Land Department Building located at 1616 West Adams Street, Phoenix, Arizona 85007. As indicated in the agenda, pursuant to A.R.S. § 38-431.03(A)(3) or (4), the Oil and Gas Conservation Commission may vote to go into executive session, which will not be open to the public, for discussion or consultation with its attorney.

The agenda for the meeting is as follows:

1. Call to Order
2. Approval of Minutes of Meeting of January 23, 2004
3. Report of Oil & Gas Administrator
  - Permits issued and wells drilled or plugged since the last meeting
  - Recently completed and current projects
  - Comparison of blanket bond amounts in Arizona, New Mexico, Utah, and Texas followed by recommendation, discussion, and possible action on amending the blanket bond amounts in Arizona
4. Ridgeway Arizona Oil Corporation well 9-22-29 State (Permit 898) and 10-16-31 State (Permit 899), Apache County: Wells were plugged in February 2004
5. Overview of the St. Johns Project: Presentation by Steve Melzer, Director Ridgeway Petroleum Corporation
6. St. Johns Project Drilling: Presentation by Alan Means, Cambrian Management
7. Ridgeway Arizona Corporation wells 3-1 State (Permit 884), 22-1X State (Permit 888), 11-21 State (Permit 895), 10-22 State (Permit 896), 9-21 State (Permit 897), and 12-15-30 State (Permit 900), Apache County
  - Procedural history of request for temporary abandonment, expiration of temporary abandonment
  - Notice to Ridgeway about current status
  - Possible executive session pursuant to A.R.S. § 38-431.03(A)(3) or (4) Procedural remedies and or enforcement options
  - Possible decision concerning request for temporary abandonment
8. Call to the public
  - This is the time for the public to comment. Members of the Commission may not discuss items that are not on the agenda. Therefore, action taken as a result

of public comment will be limited to directing staff to study the matter or scheduling the matter for further discussion and decision at a later date.

9. Announcements
10. Adjournment

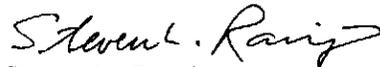
The Oil and Gas Conservation Commission may vote to go into Executive Session, pursuant to A.R.S. § 38-431.03(A)(3) or (4), which will not be open to the public, to consult with its attorney and receive legal advice with respect to any regular agenda item listed on this agenda.

A copy of the agenda background material provided to Commission members (with the exception of material relating to possible executive sessions) is available for public inspection at the Oil and Gas Administrator's office, 416 West Congress, Suite 100, Tucson, Arizona 85701.

The public may be afforded an opportunity to comment on any item on the agenda; however, at the beginning of the meeting, the Commission may vote to set up a time limit on individual comments.

Dated this 23rd day of April 2004

OIL AND GAS CONSERVATION COMMISSION



Steven L. Rauzi  
Oil and Gas Administrator

*Persons with a disability may request a reasonable accommodation such as a sign language interpreter, by contacting Steve Rauzi at (520) 770-3500. Requests should be made as early as possible to allow time to arrange the accommodation. This document is available in alternative formats by contacting Steve Rauzi at (520) 770-3500.*

**OIL AND GAS CONSERVATION COMMISSION**  
416 West Congress #100  
Tucson, Arizona 85701

Minutes of Meeting  
January 23, 2004

Present:

Dr. J. Dale Nations, Chairman  
Mr. Robert L. Jones, Vice-Chairman  
Mrs. Michele P. Negley, Member  
Mr. Robert L. Wagner, Member  
Dr. Larry D. Fellows, Director and State Geologist  
Mr. Steven L. Rauzi, Oil and Gas Administrator

Dr. J. Dale Nations, Chairman, called the regular Commission Meeting of January 23 to order at 10:00 a.m. in Room 321, State Land Department Building, Phoenix, Arizona.

Dr. Nations moved agenda items 5 and 6 on the agenda to the end following agenda item 9.

APPROVAL OF THE MINUTES OF THE MEETING OF JULY 25, 2003

Mrs. Negley moved, seconded by Mr. Jones:

THAT THE MINUTES OF THE MEETING OF JULY 25, 2003, BE ACCEPTED  
AS PRESENTED

Motion carried unanimously.

REPORT OF DIRECTOR AND STATE GEOLOGIST

Dr. Fellows reported that he did not anticipate any change in the current biennial budget for fiscal years '04 and '05. Cuts in the previous biennial budget had resulted in sufficient funding for only 8.5 of the 12 authorized FTEs. He noted that the previous reductions did not affect any oil and gas activities.

REPORT OF THE OIL AND GAS ADMINISTRATOR

The activity report of Mr. Rauzi was sent to the Commissioners and has been made a part of these minutes. Mr. Rauzi reported that Clayton Williams Energy drilled a dry hole north of Flagstaff, and that he had completed a report on helium production and potential in Arizona. He compared the bonding requirements in Arizona with those in Utah and New Mexico. After some discussion, the Commissioners requested Mr. Rauzi to further research the issue and present a definite recommendation at the next meeting.

COPPER EAGLE GAS STORAGE WELLS 1-24 SUNCOR (PERMIT 909), 1-19 SUNCOR (PERMIT 911), AND 1-12 KAKERLEE (PERMIT 912), MARICOPA COUNTY

Mr. Rauzi discussed El Paso's written request for temporary abandonment and described the mechanical integrity of the wells. He recommended temporary abandonment for a period of

five years. Mr. Gettman reported that El Paso purchased Copper Eagle in August 2003 and described the ongoing testing to determine the viability of their gas-storage project.

Mr. Wagner moved, seconded by Mr. Jones:

THAT THE COMMISSION APPROVE COPPER EAGLES'S REQUEST FOR  
TEMPORARY ABANDONMENT FOR A PERIOD OF FIVE YEARS

Motion carried unanimously.

HIGH PLAINS PETROLEUM WELL 12-16-28 STATE (PERMIT 902), APACHE COUNTY

Mr. Rauzi discussed High Plains's written request for temporary abandonment and described the current condition of the well. Mr. Somers described his time frame to finish testing the well. Mr. Rauzi recommended temporary abandonment for a period of one year. Mr. Somers responded that was sufficient.

Mrs. Negley moved, seconded by Mr. Jones:

THAT THE COMMISSION APPROVE HIGH PLAIN'S REQUEST FOR  
TEMPORARY ABANDONMENT FOR A PERIOD OF ONE YEAR

Motion carried unanimously.

Mr. Wagner noted that the well number on the agenda was different from the well number the Commissioners had taken action on. Mr. Rauzi reported that the well number on the agenda was a typographical error. Mr. Somers had no objection to the action taken even though the well number on the agenda was in error.

GUS BERRY WELL 26-1 STATE (PERMIT 886), COCONINO COUNTY

Mr. Rauzi reviewed the status of the well and his correspondence with Mr. English, the attorney for the Gus Berry estate. Mr. English had written that Nadine Berry, Gus Berry's daughter, was aware that the bond should be applied to the plugging liability because they had no ability to plug the well. Mr. Rauzi reported that he had sent a copy of the agenda to Mr. English and had received no other correspondence from Mr. English or Miss Berry.

Mr. Jones moved, seconded by Mr. Wagner:

THAT THE COMMISSION FORFEIT GUS BERRY'S BOND FOR FAILURE TO  
PLUG AND ABANDON

Motion carried unanimously.

RIDGEWAY ARIZONA OIL CORPORATION WELL 9-22-29 STATE (PERMIT 898), APACHE COUNTY

Mr. Rauzi reviewed the written correspondence concerning Ridgeway's obligation to plug the 9-22-29 well including the following: Ridgeway's relinquishing of its State lease in

January 1999, the Commission's decision to not grant temporary abandonment in its meeting of May 7, 1999, and the January 22, 2004, letter from Ridgeway, signed by Mr. L. Stephen Melzer, Director of Ridgeway Arizona Oil Corporation, that Mr. Osborn distributed to the Commissioners during the meeting. Ridgeway committed to plug and abandon the 9-22-29 well during the month of February 2004 in the letter signed by Mr. Melzer. Mr. Rauzi described and discussed the application to plug and abandon the 9-22-29 well that was attached to an earlier letter signed by Mr. Melzer.

After some discussion, Mr. Wagner moved, seconded by Mr. Jones:

TO TABLE THE ISSUE AND TO CALL A SPECIAL MEETING IF ACTION TO PLUG THE WELL WAS NOT COMPLETED BY THE END OF MARCH

After further discussion, Mr. Wagner withdrew his motion and Mr. Jones withdrew his second. Mrs. Negley moved, seconded by Mr. Jones:

TO GRANT TEMPORARY ABANDONMENT UNTIL MARCH 1, 2004, TO ALLOW RIDGEWAY SUFFICIENT TIME TO PLUG AND ABANDON THE 9-22-29 WELL BY THAT DATE

Motion carried unanimously.

RIDGEWAY ARIZONA OIL CORPORATION WELLS 3-1 STATE (PERMIT 884), 22-1X STATE (PERMIT 888), 11-21 STATE (PERMIT 895), 10-22 STATE (PERMIT 896), 9-21 STATE (PERMIT 897), 10-16-31 STATE (PERMIT 899), AND 12-15-30 STATE (PERMIT 900), APACHE COUNTY

Mr. Rauzi discussed the January 22, 2004, letter requesting temporary abandonment from Ridgeway that Mr. Osborn distributed to the Commissioners during the meeting in light of the well data and correspondence the Commission had received from Ridgeway over the past five years. Mr. Rauzi reported that Ridgeway had been working on the wells for at least five years. He recommended a shorter period of temporary abandonment and four years requested by Ridgeway.

Regarding the last sentence of the first paragraph of Ridgeway's January 22 letter, Ms. Woodall, counsel for the Commission, stated for the record that Ridgeway's obligations with respect to existing wells were not legally or administratively linked to the granting of additional drilling permits and that the Commission did not accept such linkage as a condition or qualification.

Mr. Osborn asked what specific questions or issues the Commissioners wanted Ridgeway to address and requested a period of temporary abandonment to allow Ridgeway time to present a response.

Dr. Nations indicated a need for more complete and up-to-date information on each of the existing wells. He suggested a folder for each well with all the information that's available and an explanation as to how any new techniques are expected to improve each of the particular boreholes. The Commissioners agreed. Mr. Osborn indicated that Ridgeway would get the materials to the Commissioners in advance of the next meeting.

Mr. Wagner moved, seconded by Mrs. Negley:

TO GRANT A SIX-MONTH TEMPORARY ABANDONMENT TO THE WELLS

Motion carried unanimously.

CALL TO THE PUBLIC

Mr. Buff reported that the IBLA, the Interior Board of Land Appeals, did not grant Mr. Rodney Ratheal a stay in his appeal of the Bureau of Land Management's decision to terminate his Dutchman unit on the Arizona Strip. He noted that the unit was terminated for lack of diligence under the diligence requirement of the unit agreement.

ANNOUNCEMENTS

The Commission scheduled its next meeting at 10:00 a.m. on April 30, 2004, in Room 321 at the State Land Department Building in Phoenix.

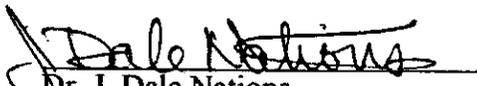
ADJOURNMENT

Mrs. Negley moved, seconded by Mr. Wagner:

THAT THE MEETING BE ADJOURNED

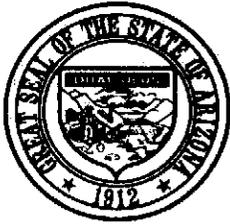
Motion carried unanimously. Time of adjournment was 11:55 a.m.

APPROVED

  
Dr. J. Dale Nations  
Chairman

GUESTS IN ATTENDANCE

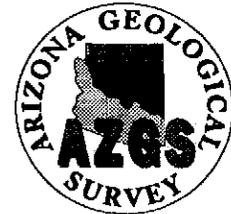
Richard Ahern	Arizona State Land Department
Alan Bohnenkamp	Arizona Corporation Commission Pipeline Safety
Paul J. Buff	U.S. Bureau of Land Management
Theresa Craig	Assistant Attorney General, Land Department
Greg Gettman	El Paso
Gordon LeBlanc Jr.	Holbrook Basin LLC
Marc Osborn	R & R Partners
Mike Rice	Arizona State Land Department
John Somers	High Plains Petroleum
Scott Somers	High Plains Petroleum
Eric Thornton	Ridgeway Arizona Oil Corporation
Laurie Woodall	Assistant Attorney General, Oil and Gas Conservation Commission



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Larry D. Fellows  
Director and State Geologist

April 22, 2004

To: Oil and Gas Conservation Commissioners

From: <sup>SLR</sup> Steven L. Rauzi, Oil and Gas Administrator

Re: Activity Report for the April 30, 2004, Meeting

Three permits were issued to Ridgeway Arizona Oil Corporation since your last meeting on January 23, 2004. Ridgeway expects to start work on the wells in May.

Ridgeway plugged the 9-22-29 State and the 10-16-31 State in February. Ridgeway plugged the 10-16-31 because it failed a casing integrity test.

I am working on a project funded through a contract with the US Department of Energy entitled "Southwest Regional Partnership for Carbon Sequestration." Other partners include the geological surveys of New Mexico, Utah, Colorado, and Oklahoma.

Our task is to investigate potential geologic carbon sequestration sites in Arizona. We hired Mr. Michael K. Mahan on a limited, full time basis to assist in this effort. We are (1) digitizing the locations of oil and gas wells, (2) scanning well logs, and (3) assembling subsurface data about oil, gas, and deep saline reservoirs in Arizona.

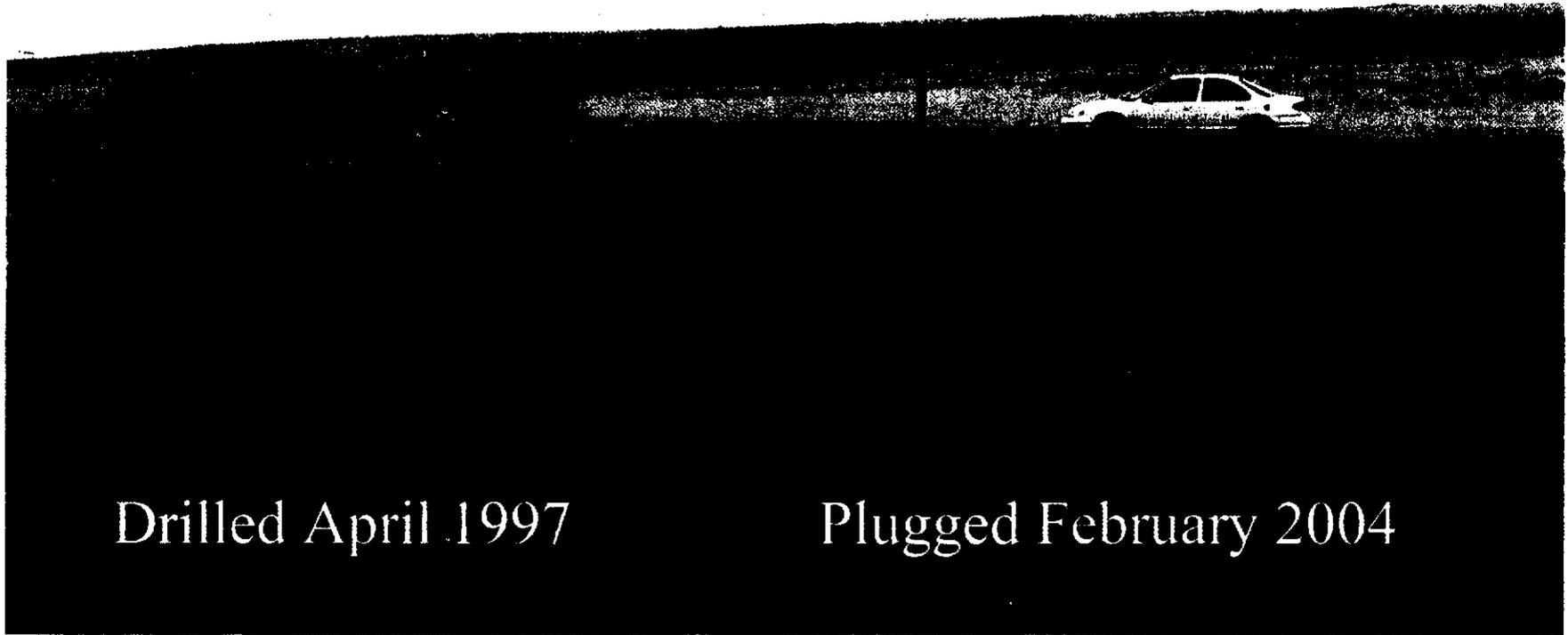
The blanket bond in Arizona, New Mexico, and Utah does not vary as the number of wells increases. We reviewed this in your last meeting. The State of Texas, on the other hand, requires a variable blanket bond depending on the number of wells. It is \$25,000 for 10 or fewer wells, \$50,000 for 11 to 99 wells, and \$250,000 for 100 or more wells. Texas adopted its blanket bond in order to slow the growth in the numbers of abandoned and unplugged wells.

I recommend that the Commission adopt a variable blanket bond requirement similar to the variable blanket bond requirement in Texas.

Comparison of blanket bonding in Arizona, New Mexico, Utah, and Texas:

- |                        |                   |           |
|------------------------|-------------------|-----------|
| • Arizona (R12-7-103): | All wells         | \$25,000  |
| • New Mexico (P3.101): | All wells         | \$50,000  |
| • Utah (R649-3):       | All wells         | \$120,000 |
| • Texas (R3.78):       | 10 or fewer wells | \$25,000  |
|                        | 11 to 99 wells    | \$50,000  |
|                        | 100 or more wells | \$250,000 |

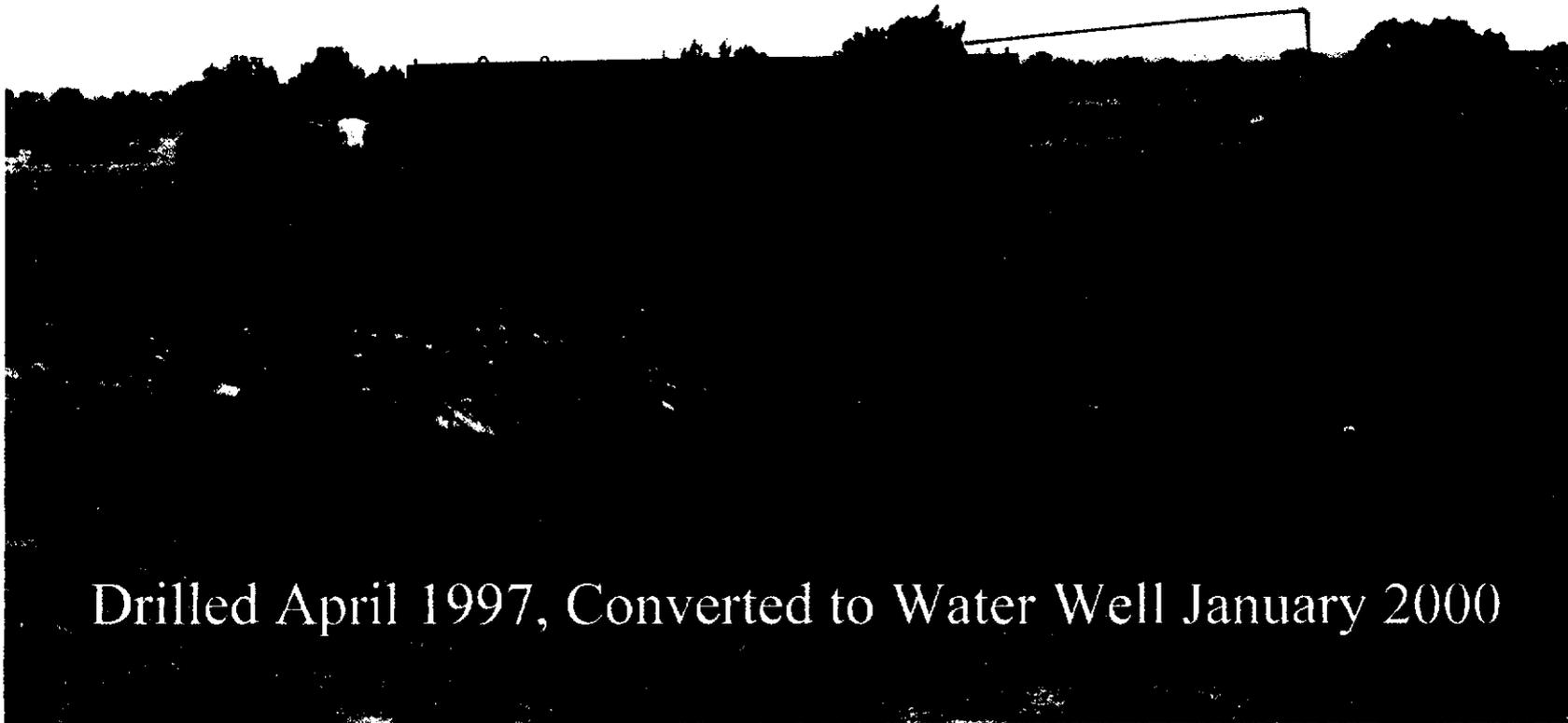
# Ridgeway 9-22-29 State



Drilled April 1997

Plugged February 2004

# Ridgeway 10-26-29 State



Drilled April 1997, Converted to Water Well January 2000

# Ridgeway 10-10-97



Drilled May 1997

Plugged February 2004

# Part 1: Overview of the St. Johns Project

## Presentation to the Arizona Oil and Gas Conservation Commission

Steve Melzer

April 30, 2004



# Brief Bio

Steve Melzer is a practicing geological engineer in Midland, Texas and a Director in Ridgeway Petroleum Corp. He is a consulting engineer in CO<sub>2</sub> flooding. He is also the managing partner in Melzer Exploration Company, an oil and gas investment company. He is also a past Director of the University of Texas of the Permian Basin's Center for Energy and Economic Diversification where he led research projects and was the founding director of the initial CO<sub>2</sub> Flood Conference in 1995, a position he retains today.

Steve is a graduate of Texas A&M (receiving his bachelor of science degree in geological engineering in May of 1968) and Purdue University where he received his Masters in Engineering (soil and rock mechanics). He served with the US Air Force from 1969-1978 where he conducted site selection and ground shock engineering research at Air Force Weapons Laboratory at Kirtland AFB in Albuquerque.



# Presentation Goals

- Provide an Overview and Update on the Project (Level of Expenditures, Team of Companies, Venture Components)
- Describe Need for and Features of the Unit Agreement
- Describe On-going and Future Work Plans

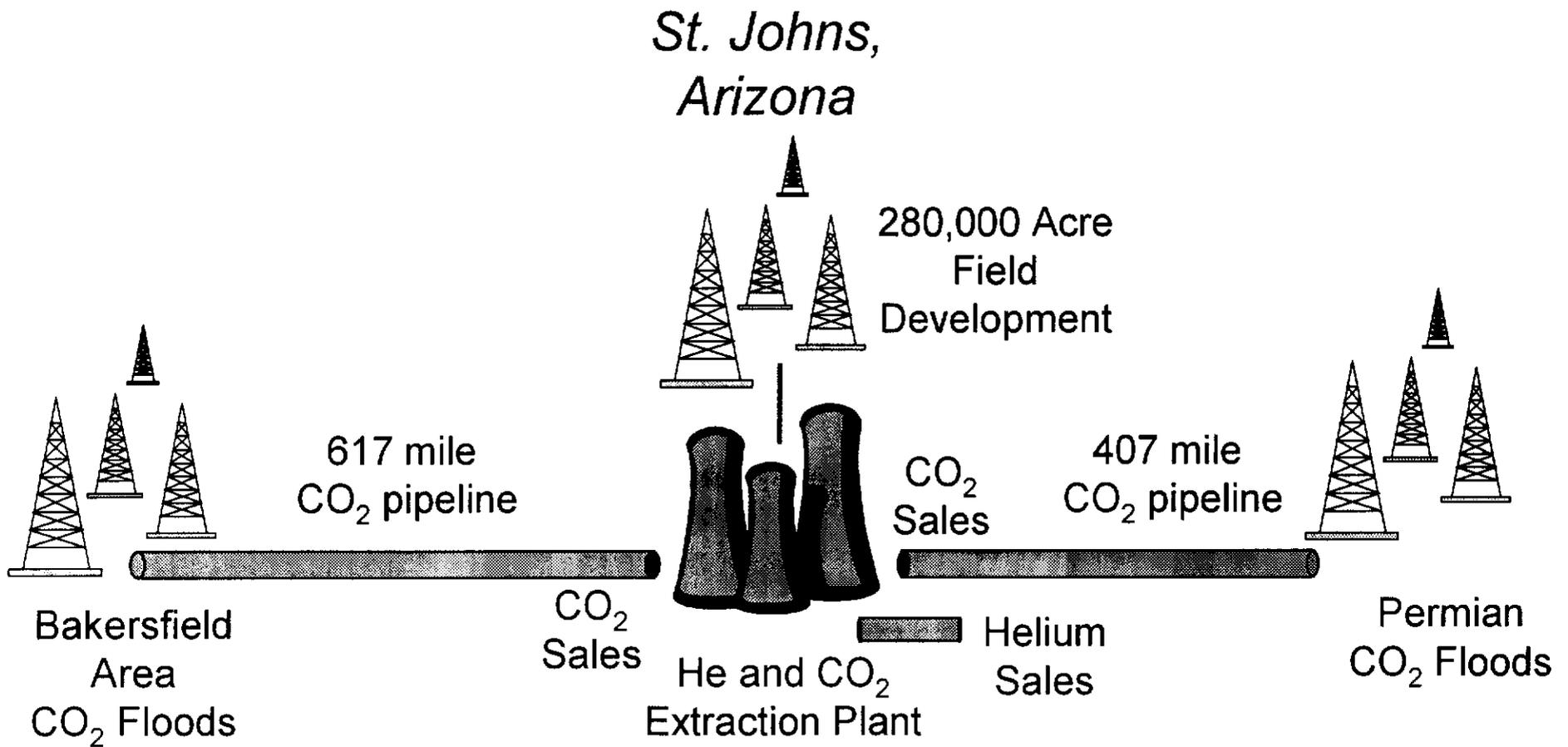


# Overview (1) – CO<sub>2</sub> Liquids Plant

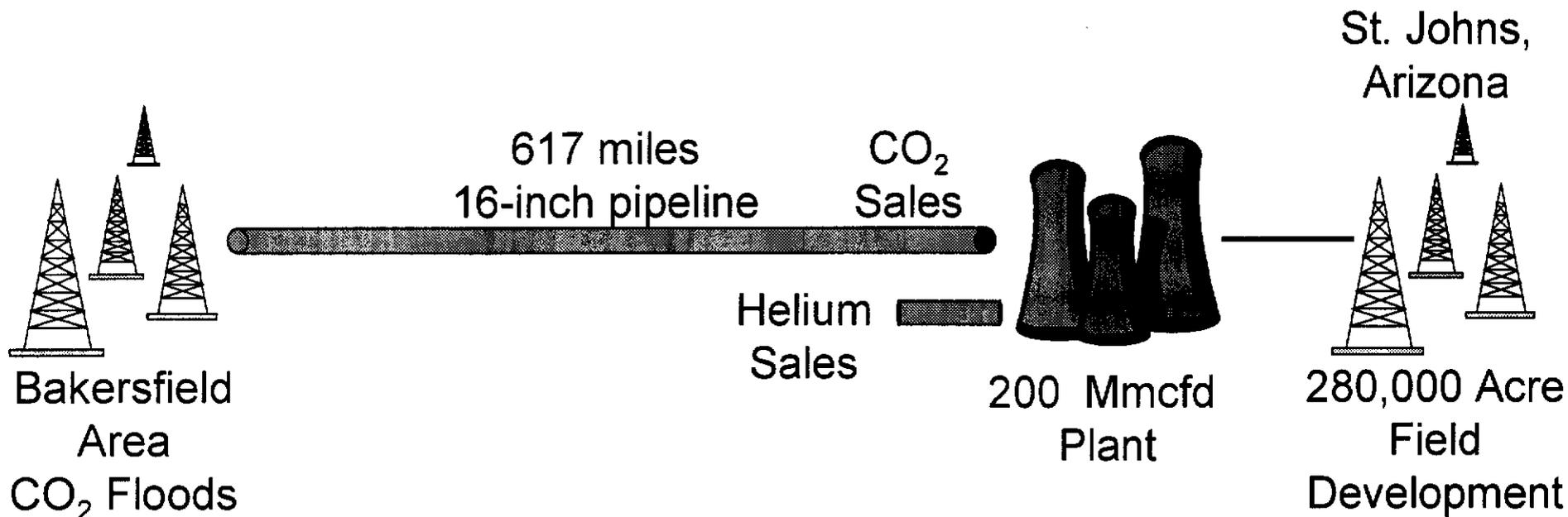
- Operated by Reliant Holdings Ltd.
  - Production Started in July 2002
  - Current Production Capacity - 120 tons/day
  - Projected to Grow to 500 tons/day in 2005
  - Provides First Project Cash Flow



# Overview (2) - St. Johns Development Schematic



# Overview (3) – St. Johns Venture (200 mmcfpd Case)



Project Capital  
(Total \$445 million)

\$280 million

\$55 million

\$110 million



# Attributes of the Project

- **Size (\$0.5-0.9B)**
- **Uniqueness (He+CO<sub>2</sub>)**
- **Diverse Technologies and Markets**
- **Accruing Expenditures (\$27 million and Still Growing)**



# The Team of Companies (1)

- **Alliance of Companies Necessary**
  - **Ridgeway Arizona Oil Corp.**
    - **Holds over 242,000 acres of Leases**
    - **Parent is Ridgeway Petroleum Corp. - Calgary based and traded on the TSX Venture Exchange**
    - **World class Helium and CO<sub>2</sub> Reserves**
      - **Based on Cobb and Associates Report**
    - **Six years of field delineation/project definition**



# The Team of Companies (2)

- **Alliance of Companies (Cont'd)**
  - **World Class Rare Gas Corporation**
    - **International Presence (>65 Countries)**
      - **Multi-Billion Enterprise**
      - **Process Innovation**
      - **Market for the Helium**



# The Team of Companies (3)

- **Alliance of Companies (Cont'd)**
  - **Major U.S. Pipeline Corporation**
    - **Owns and Operates the Most Extensive of U.S. Natural Gas Pipeline Systems**
    - **Potential Right-of-Way for Project**

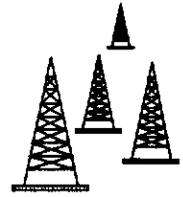


# The Team of Companies (4)

- **Alliance of Companies (Cont'd)**
  - **EOR Companies**
    - **Last Major Initiative for Team Formation**
    - **Interest in California Project by Three California Oil Producers**
    - **Contacts on-going for Interest Levels in both Equity and Contracted CO<sub>2</sub> Volumes**



# Project Components



- **Leases and Reserves**
  - 280 thousand acres
  - Reserves of 13.9 Tcf of CO<sub>2</sub> & 64 Bcf of Helium
- **Field Development of \$110 million (200 mmcfpd Case)**
  - Up to 270 wells; 250 miles of Gathering
  - **Typical Well Data**
    - 2.0 MMcfd per Well
    - 150 p.s.i.g. Wellhead Pressure
    - Ft. Apache / Amos Wash / Riggs Zones
    - Gas Composition (upper two zones) is 93.7% CO<sub>2</sub>, 0.6% Helium, Balance: Nitrogen







# Unit Agreement

- **Consolidates Multiple Leases into One “Umbrella Lease” w/ Additional Terms/Conditions**
- **Allows Time for Implementation of Venture**
- **Allows Reserves to be Assured for the Term of the Venture**
- **Allows for Conservation of Production**
- **Allows for Efficiency of Development**



# Completed Initiatives

- **CO<sub>2</sub> Liquids Plant**
- **Field Delineation (18 wells)**
- **PL Routing & Plant Process and Design Studies by Consulting Engineering Companies**
- **Project Economic Scoping Modeling**
- **Venture Team Assembled**

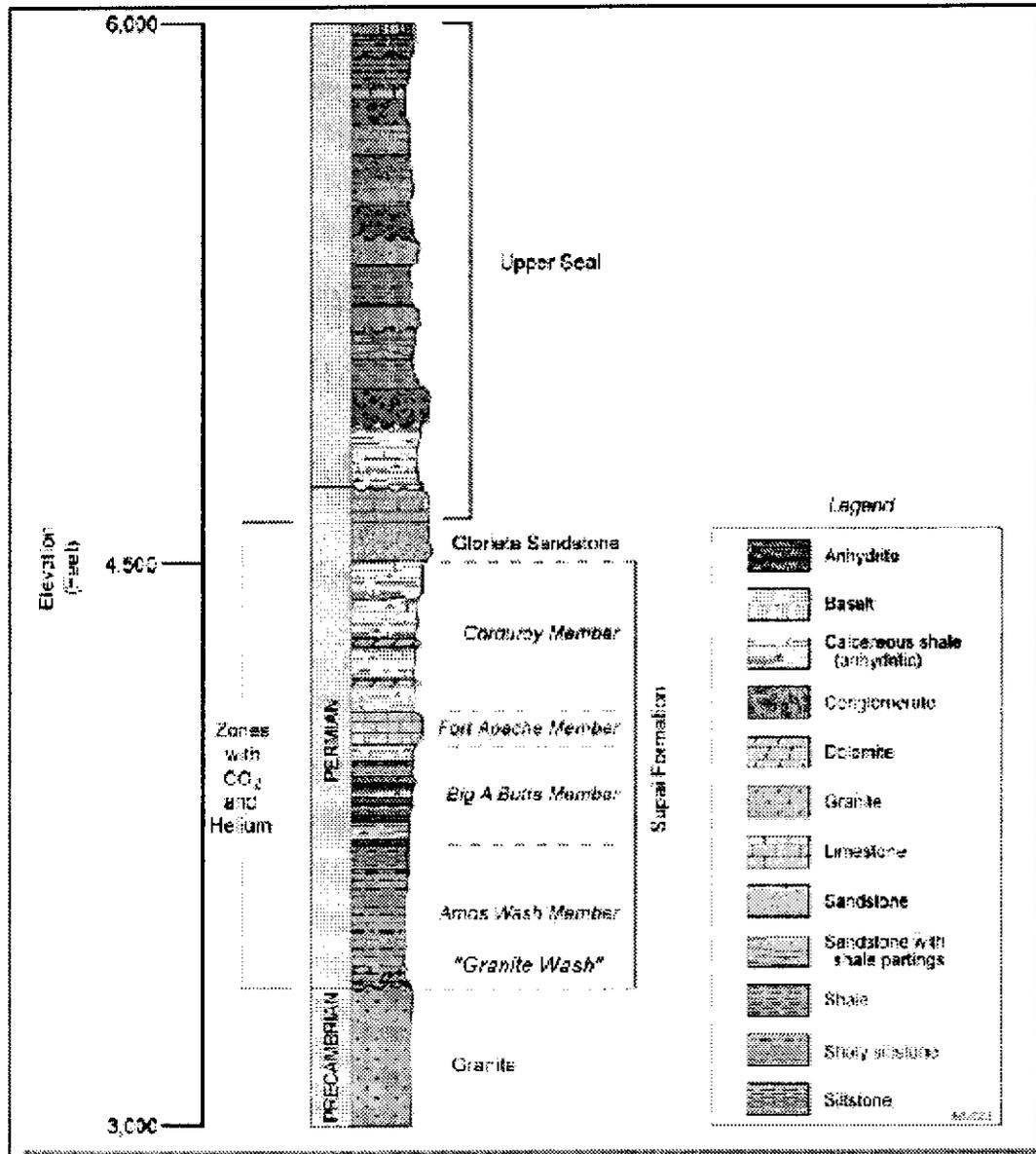


# On-Going Initiatives

- **Arizona Unit Agreement**
- **CO<sub>2</sub> Liquids Plant Expansion**
- **CO<sub>2</sub> EOR Aggregation**
- **Development/Appraisal Project Drilling and Testing**



# St. Johns Field Stratigraphic Section



- **Identified producing zones prospective for Helium and CO<sub>2</sub>:**
  - Fort Apache
  - Upper Amos Wash
  - Oak Creek (limited)
  - Lower Oak Creek (“Granite Wash”)
- **Variance of Helium and CO<sub>2</sub> composition between zones**

# Part 2: St. Johns Project Drilling

## Presentation to the Arizona Oil and Gas Conservation Commission

Alan Means, Cambrian Management

April 30, 2004



St. Johns Helium/CO<sub>2</sub> Field  
**Cambrian Management, Ltd.**

- Cambrian is a registered professional engineering firm in the State of Texas #F-005345
- The principles of Cambrian, Alan D. Means, PE (operations and drilling) #72082 & Sal Pagano (reservoir engineering) #54688
- Cambrian has a staff of 3 professionals with a combined experience of over 83 years
- Cambrian's experience ranges from the Rockies to the Gulf Coast of Texas



## St. Johns Helium/CO<sub>2</sub> Field Formation Hazards

- Clay Contents Range from 1 to 24%
  - Illites
  - Kaolinites
  - Chlorites
- Iron Content
  - Hematitic cementation of sand grains
  - Iron from the Chlorite clays
  - Free iron



## St. Johns Helium/CO<sub>2</sub> Field Clay Hazards

- The clays in the producing formations are migrators
- Any contact with fresh water will cause migration which plugs the pore throats
- Any contact with hydrochloric acids (HCl) will cause the formation of Ferric Hydroxide scale



## St. Johns Helium/CO<sub>2</sub> Field Iron Hazards

- The iron content of these formations is so high it would be impossible to chelate it for an effective HCl stimulation
- If acid stimulation is required an acetic system would be required
- The introduction of oxygen into the formation could cause iron oxide scales
- The introduction of bacteria into the formations could also result in ferric hydroxide scales
- The chemistry of iron compounds are very complex due to the two oxidation states in water
- Due to the insolubility of iron compounds it is imperative that they be prevented



## St. Johns Helium/CO<sub>2</sub> Field Fresh Water Production

- Many of the wells in the field produce fresh water. We know that the TDS from the formations range from 70,000 to 88,000ppm. There are three possible avenues of the fresh water production:
  1. Vertical near-wellbore fractures from water based fracture stimulations
  2. Channels behind pipe due to poor primary cement placement
  3. Natural vertical fractures



## St. Johns Helium/CO<sub>2</sub> Field

### Low Field Gradients: .28 to .33 psi/foot

- **Lost circulation during drilling operations is major problem in the field due to the low gradients (Especially when drilling on topographic highs)**
- **Lost circulation during primary cementing is also a major problem resulting in poor cement bonds**
- **Differential sticking of the drill string is also a major problem**



## St. Johns Helium/CO<sub>2</sub> Field pH Concerns

- **As a result of the CO<sub>2</sub> in the producing formations the pH of the system ranges from +/- 4.5 to 5.5 this results in:**
  - 1. Low scaling tendencies**
  - 2. High corrosion tendencies**
- **Any increase in pH (e.g., drilling fluids) will upset this balance resulting in the formation of calcium carbonate and iron based scales**



St. Johns Helium/CO<sub>2</sub> Field

# Introduction of Foreign Fluids

Due to the clay and iron content and the low pH of the formations the following are a must:

- NO Fresh water
- NO HCl acid
- NO High pH fluids
- NO Oxygenated fluids



St. Johns Helium/CO<sub>2</sub> Field  
**Fluid Recommendations**

**THUS:**

- **All drilling and stimulation fluids must have a pH of 7.0 or less**
- **All fluids must have chloride concentrations above 10,000 ppm. A potassium chloride system is recommended**
- **All fluids must have oxygen scavengers**
- **All fluids should contain a biocide**
- **Minimize total fluids of any kind pumped into the producing horizons**



## St. Johns Helium/CO<sub>2</sub> Field

# Drilling Recommendations

- **Drill the wells with an air/foam mud system**
- **Load the hole at TD with a low pH KCl polymer system**
- **AVOID any freshwater**
- **Reduce DST's and coring operations**
- **Avoid switching back forth between air and water drilling systems**
- **Set surface casing through all potential fresh water zones**
- **Cement surface pipe with lost circulation and fluid loss materials and do not pump slurries heavier than 14.2 ppg**
- **Cement long string with all geologic and loss circulation hazards in mind**



## St. Johns Helium/CO<sub>2</sub> Field

# Primary Cementing Recommendations

- Low pH cement
- Cement system must be resistant to carboic acid
- High chloride cements
- Loss circulation materials in the cement
- Include fluid loss additives
- Do not pump lead slurries heavier than 12.0 ppg
- Utilize an external casing packer (ECP) on the long string to isolate producing horizons and eliminate hydrostatic pressure
- Utilize KCl polymer spacers ahead of cement slurries
- Displace cement slurries with 2-3% KCl waters



## St. Johns Helium/CO<sub>2</sub> Field

# Recommended Completion Practices

- **NEVER** pump HCl acid into any well on this project
- If acid is required pump a 10% acetic and overflush
- Utilize 70 quality CO<sub>2</sub> fracture fluid
- Perforate all zones under balance with a 3-4% KCl fluid in the wellbore
- Flow test well several days prior to fracture stimulation and run build-up test to design fracture stimulation size
- Utilize only low pH and high chloride fluids
- Flush with CO<sub>2</sub>



## St. Johns Helium/CO<sub>2</sub> Field Damage to Existing Wells

- **All of the existing wells have some level of formation damage from:**
  1. **Contact with fresh water**
  2. **Contact with hydrochloric acid**
  3. **Contact with oxygenated fluids**
  4. **Contact with high pH fluids**
- **There are some remedies to this damage which can be attempted when the field expansion reaches their location:**
  1. **Re-fracture treatments**
  2. **Alcohol treatments**
  3. **Clay stabilization chemical treatments**
  4. **Acetic acid treatments**



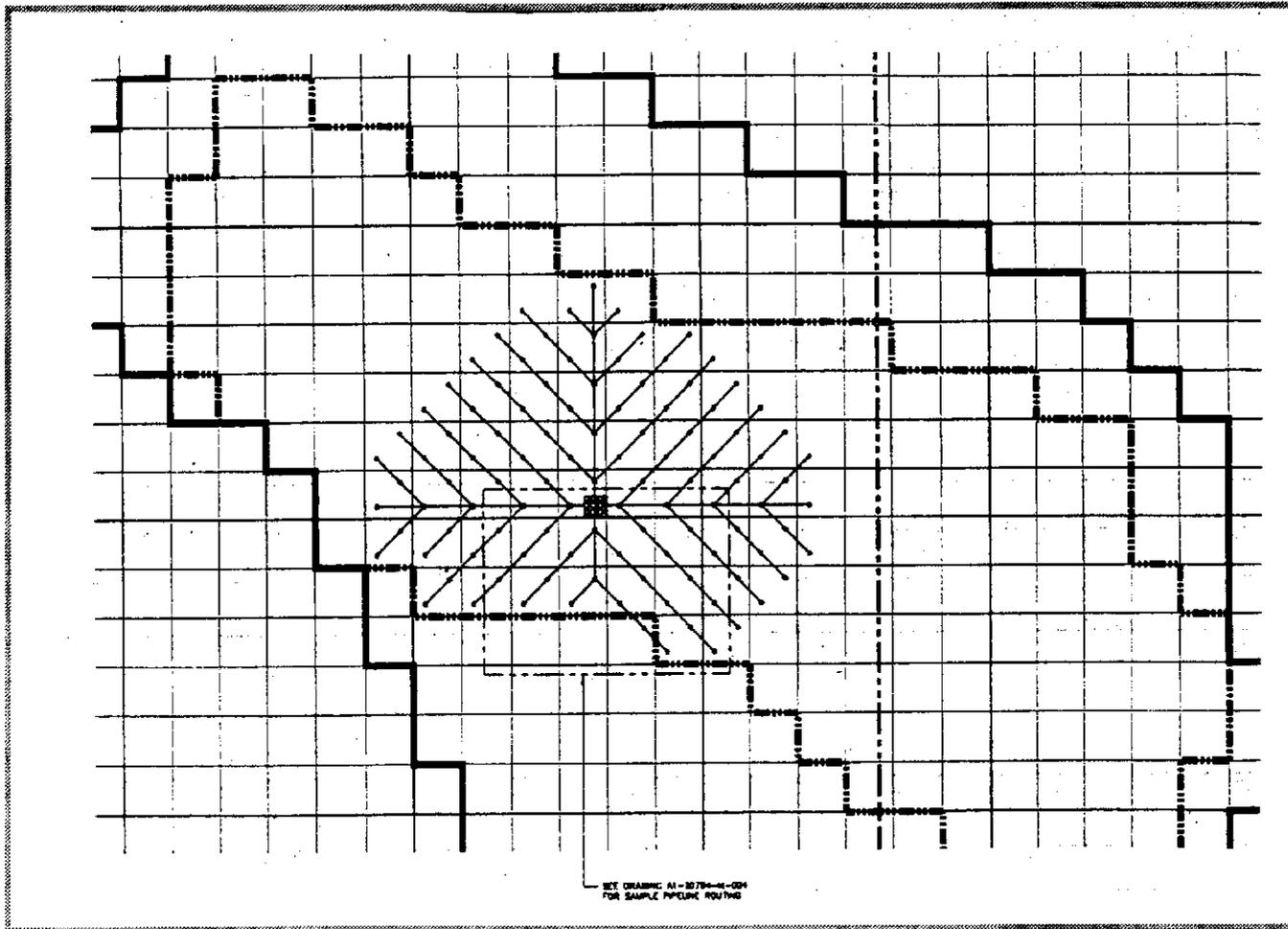
## St. Johns Helium/CO<sub>2</sub> Field

# Value of Existing Wells

- Full Scale Project Development Scenario will Move from Central Area Outward over a 15-30 year interval
- Wells on Perimeter of Unit will Develop Last
- Reservoir Information from Existing Perimeter Wells will Assist in Dictating Development Scenarios
- New Wells on Perimeter will not be Drilled until Development Moves to them
- Treatment to fracture past near wellbore damage is possible
- Stimulation treatments that reduce damage from clays is possible
- If the existing wells can be “cleaned up” they will add value as producers in the field expansion
- Thus: Current Wells Will Add greatly to the Information Base

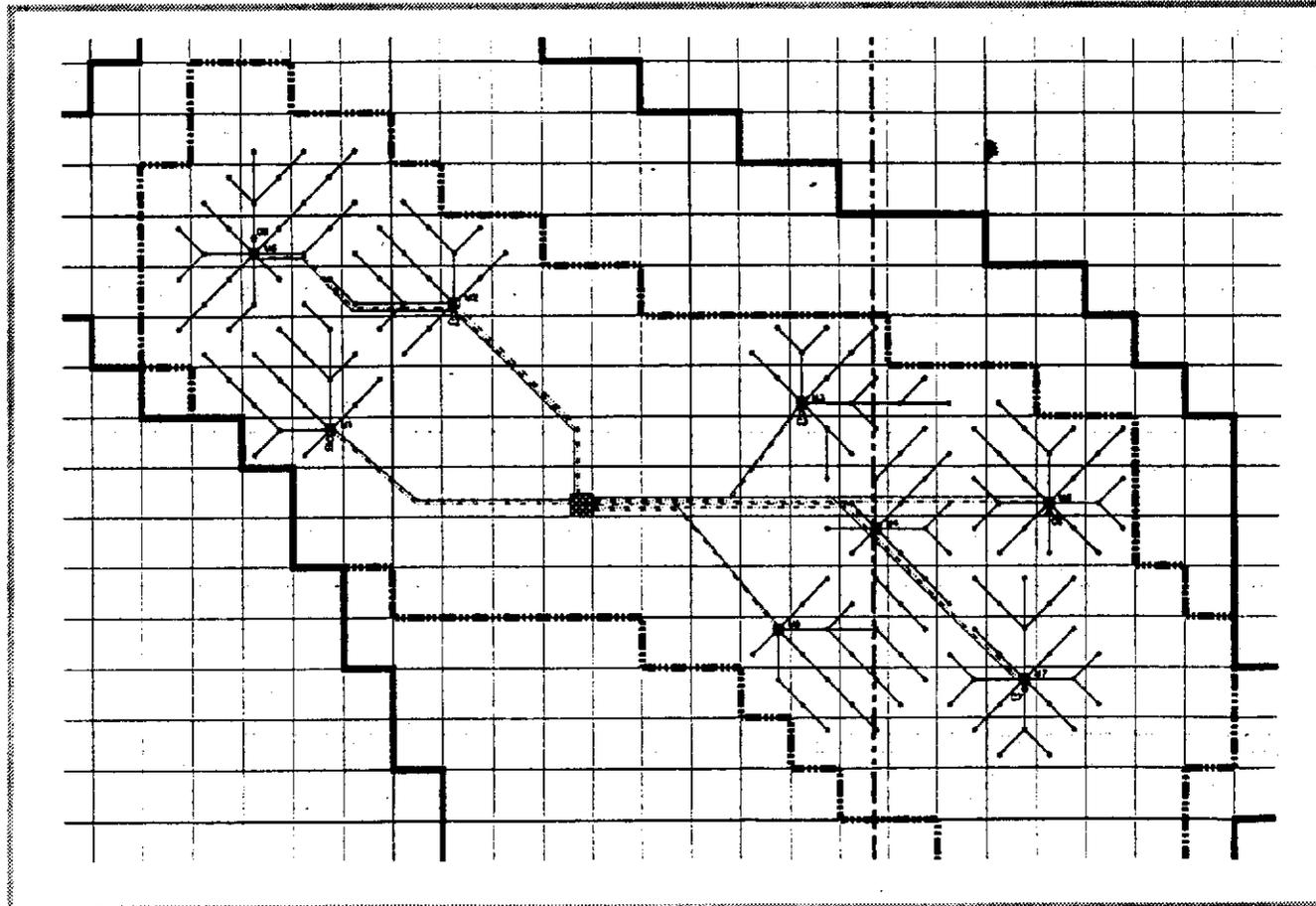


# ORDERLY DEVELOPMENT I



**Ridgeway**  
Arizona Oil Corp.

# ORDERLY DEVELOPMENT II



# RIDGEWAY ARIZONA OIL CORP

## ST. JOHNS PROJECT WELLS

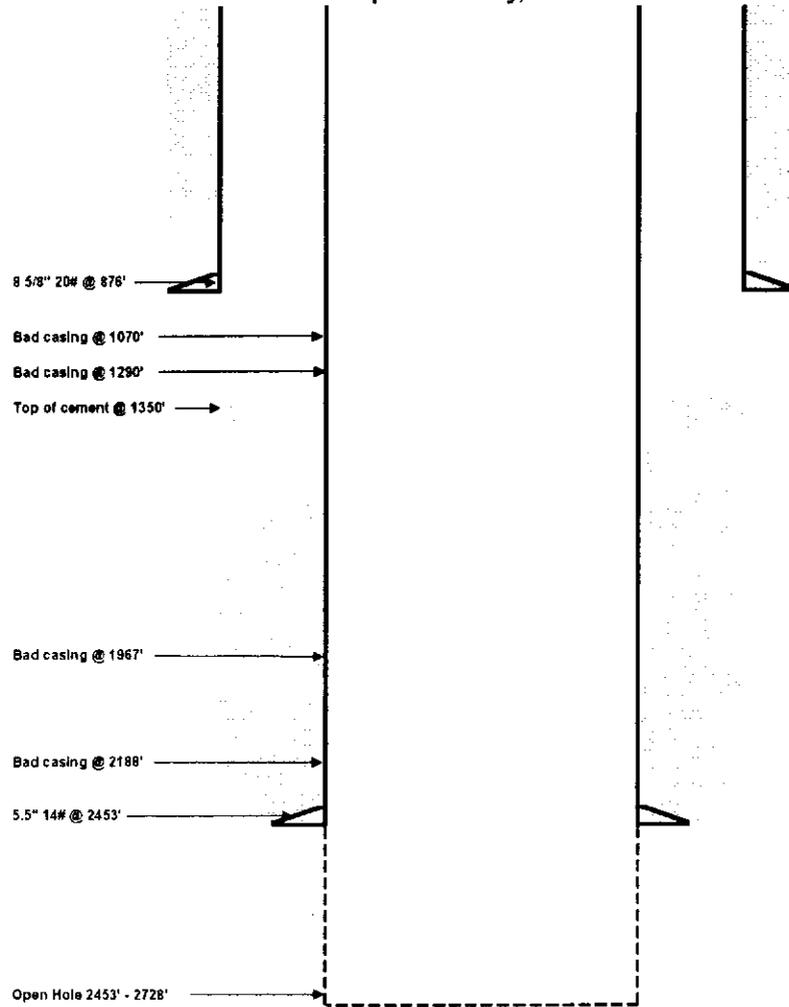
Well	Date Drilled	Status	Casing	Zones	
				Production Tested	Perforation Depth Intv'ls (ft)
AZ 22-1X	Feb-97	SI	4 1/2" FRP (4.25#)	Ft. Apache + Amos Wash	1518-1624
AZ 11-21	Feb-97	SI	4 1/2" FRP (4.25#)	Granite Wash, Amos Wash, Ft Apache	1652-1691, 1715-1744, 1787-1964, 2268-2381
AZ 9-21	Mar-97	SI	4 1/2" FRP (4.25#)	Granite Wash, Amos Wash, Ft Apache	1853-1887, 1942-2147, 2489-2659
AZ 9-22	Apr-97	P&A - 2/04*	4 1/2" FRP (4.25#)	Granite Wash, Amos Wash	2222-2296, 2336-2562, 2607-3164
AZ 10-22	Mar-97	SI	4 1/2" FRP (4.25#)	Granite Wash	2024-2070, 2070-2224
AZ 12-16	May-97	Inactive	4 1/2" FRP (4.25#)	Ft. Apache	1340-1370
AZ 3-1	Jun-97	SI	4 1/2" Steel (10.5#)	Ft. Apache	1536-1676, 1460-1499
AZ 10-26	Apr-97	P&A - 1/00**	4 1/2" FRP (4.25#)	n/a	n/a
AZ 10-16	Apr-97	P&A - 2/04*	4 1/2" Steel	Granite Wash	2590-2614
AZ12-15	May-97	SI	4 1/2" FRP (4.25#)	Granite Wash	1752-1753, 1784-1812, 1848-1872, 1904-1970
AZ 15-28	May-97	P&A - 1997	n/a	n/a	n/a
AZ 13-36	May-97	P&A - 1997	n/a	n/a	n/a

\* location to be restored  
 \*\* Transferred to Landowner after P/B



# Well 10-16

Ridgeway Arizona Oil Corporation State 10-16  
Apache County, Arizona



**Compilation of data submitted by Ridgeway Arizona Oil Corporation 1997-2004**

<u>Well (Permit)</u>	<u>Perforations</u>	<u>Comment</u>
3-1 (884)	1460-1499' 1536-1676'	Complete & SI 9/95; frac 5/97. SN1 (9/22/97) csg, perfs, request TA. SN2 (10/15/97) downhole pressure gauges at 1500' 7/19-8/3/97, no P rpt. SN3 (11/3/97) plan to change out fiberglass to stainless steel flange. xxx (1/7/99) test report dated 9/30/98 for flow test 9/15 through 9/30/98. SN4 (6/1/99) plan to flow test, collect wtr & gas samples starting 6/8. SN5 (1/6/00) plan to flow test, collect wtr & gas samples starting 1/13. SN6 (2/15/00) test report dated 2/4/00. SN7 (9/5/00) plan to set dbp and perforate Ft. Apache fr 1460-99'. SN8 (9/18/00) plan to acidize Ft. Apache on 9/22 to stimulate flow. → NO SUBSEQUENT REPORT OF ACID JOB (FLOW, PRESSURE ETC)
22-1X (888)	1518-1624'	Complete & SI 6/97; frac 6/97. SN1 (7/28/97) perf 1518-1624', frac 6/97, 1894 mcf/d. SN2 (9/22/97) csg, perfs, request TA. SN3 (10/15/97) downhole pressure gauges at 1300' 8/4-8/15/97, no P rpt. SN4 (11/3/97) plan to change out fiberglass to stainless steel flange. SN5 (5/29/97) plan to commence 7-day flow test on 6/22/98 SN6 (6/15/98) plan to commence 7-day flow test on 7/15/98 SN7 (9/28/98) test reports for flow test 9/4 through 9/7/98
11-21 (895)	1652-1691' 1715-1744' 1787-1964' 2268-2381'	SN1 (7/28/97) td 3/5/97. SN2 (8/22/97) perf 2268-2381', frac 7/97, light blow CO <sub>2</sub> . SN3 (9/18/97) csg, perfs, request TA. SN4 (10/15/97) downhole pressure gauges at 2150', swab, flow CO <sub>2</sub> & mist. SN5 (11/3/97) plan to perf 1715-44' & frac 1787-1964'. SN6 (12/3/97) frac 11/97, well did not flow back. SN7 (1/12/98) perf 1652-1691', gts, no test. SN8 (10/06/98) Swab well & 15-day flow test w/ 5 day build-up to start 11/25/98. SN9 (11/18/98) plan to run production log to locate water in-flow to start 11/18/98. SN10 (1/4/99) wtr inflow at 2250', to set dbp at 2000' & test upper zones 1/5/99. SN11 (5/11/99) 10-day test, catch wtr samples & monitor inflow, to start 5/21 → NO SUBSEQUENT REPORT OF WATER INFLOW OR WATER ANALYSIS
10-22 (896)	2024-2070' 2070-2224'	SN1 (7/28/97) td 3/29/97, perf 2070-2224', plan to frac 7/31. SN2 (9/22/97) csg, perfs, request TA. SN3 (10/15/97) perf 2024-70', swab fluid at 1800', small puff gas did not last. SN4 (11/4/97) plan to frac 2070-2224'. SN5 (12/3/97) frac 11/97, well did not flow back. SN6 (10/06/98) 15-day flow test w/ 5 day build-up to start 11/11/98. → NO SUBSEQUENT REPORT OF FLOW TEST Completed well 7/2/02
9-21 (897)	1853-1887' 1928-2147'* 2489-2659'*	SN1 (7/28/97) td 3/18/97, perf 1928-2147', plan to frac 7/28. SN2 (8/5/97) perf 1942-2147', frac 7/97, flowed back, died, swab wtr. SN3 (8/22/97) cmt squeeze perfs 1942-2147'. SN4 (9/18/97) csg, perfs, request TA. SN5 (10/15/97) drl cmt 1910-2150', swab, well kicked off, blow well & clean up? SN6 (11/3/97) plan to change out fiberglass to stainless steel flange. SN7 (10/6/98) tentative 15-day flow test w/ build-up to start 10/15/98. xxx (11/18/98) test reports for flow and build-up tests 10/9 through 10/29/98 SN8 (9/5/00) plan to set dbp, perforate Ft. Apache, flow 1 day and sample gas. SN9 (9/19/00) plan to acidize Ft. Apache on 9/22 to stimulate flow. → NO SUBSEQUENT REPORT OF ACID JOB (FLOW, PRESSURE ETC)

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<u>Well (Permit)</u>	<u>Perforations</u>	<u>Comment</u>
9-22-29 (898)	2222-2296' 2336-2562'* 2607-3164'*	SN1 (9/22/97) csg, perfs, request TA. SN2 (10/15/97) perf 2222-96', fluid at 1000', could not swab fluid below 1700'. LTR (1/15/99) Ridgeway drops State lease, leaves well unplugged. SN3 (2/25/04) Plugged well, will restore loc (reserve pit left on location).
10-16-31 (899)	2590-2614'	SN1 (7/28/97) td 5/7/97, perf 2590-2614', plan to frac 7/28. SN2 (8/22/97) frac 7/97, developed csg problems on pad. SN3 (9/18/97) csg, csg is parted, request TA. SN4 (10/15/97) can't fill hole above 1092', retrieve 37 jts csg, fish 10 jts. SN5 (12/17/97) plan to drill out old csg and run new csg. SN6 (1/2/98) plan to drill out old csg, run and cmt new csg. SN7 (5/27/98) plan to drill out cement shoe and prepare for completion. SN8 (6/11/98) plan to frac on 6/15/98 SN9 (6/15/98) plan to frac rescheduled to start 7/10/98 SN10 (10/06/98) plan to start 15-day flow test w/ build-up on 12/16/98. xxx (1/7/99) test report dated 1/4/99 for flow test 12/21/98 through 1/4/99. SN11 (3/3/00) flow test to determine line sizing for liquids plant to start 3/14/00. SN12 (7/26/01) plan to frac on 8/11/01 with 75,000 lb and flow back to pit. SN13 (1/19/04) plan to run casing integrity test SN14 (1/23/04) subsequent report for 8/11/01 frac (SN12) = 471-420 psi in 5 min. SN15 (2/24/04) Failed MIT, plugged well, will restore loc (separator left on location).
12-15-30 (900)	1784-1812' 1848-1970'	SN1 (7/28/97) td 5/14/97. SN2 (9/9/97) perf 1848-1970', swab wtr, squeeze, perf 1784-1812', wtr at 800'. SN3 (9/18/97) csg, perfs, request TA.
13-36-29 (901)	None	TD & PA 5/20/97.
12-16-28 (902)	1340-70'	SN1 (7/28/97) td 5/26/97. SN2 (9/22/97) csg, perfs, request TA. SN3 (10/15/97) perf 1340-70', swab dry, acidize 9/97, well blowing then dead. LTR (01/15/99) Ridgeway drops State lease, leaves well unplugged.
10-26-29 (903)	None	SN1 (7/28/97) td 5/2/97. SN2 (9/18/97) ran csg to td, no perfs. SN3 (10/15/97) drlg info and dates for p/n 900, request TA. LTR (01/15/99) Ridgeway drops State lease, leaves well unplugged. P&A (01/05/00) Plugged back and turned over to land owner as water well.
15-28-29 (904)	None	TD & PA 6/1/97.

4/23/04

OGCC Mtg

April 30, 2004

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Ridgeway

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State Land

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AZ Geological Survey

BLM

Ridgeway

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ASLD

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