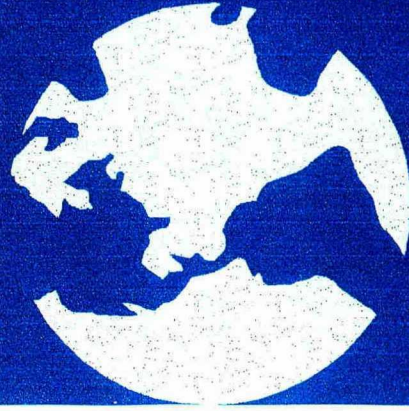


Improvements to Directional/Horizontal Rules



Presentation before the NM Oil
Conservation Division on April 10, 1997

Discussion Agenda

- Introduction: *(The team, the work group process, etc.)*
- Review of current rule 111.
- The new & improved rule 111.
- Comparison: what changed?
- Summary, benefits, and next steps.....

The Rule 111 Work Group

- C. Wade Howard (Texaco, Midland)
- Donna Williams (Burlington, Midland)
- George Sharpe (Merrion, Farmington)
- Rick Foppiano (OXY, Midland)
- Mike Stogner (NMOCD, Santa Fe)

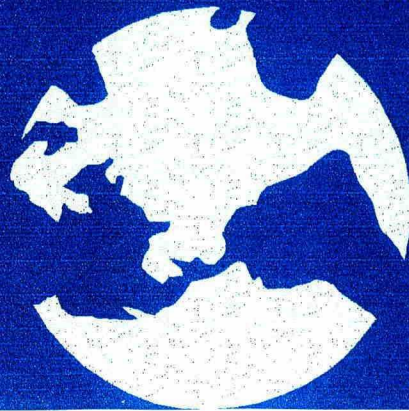
The Work Group Process....

- Define & agree on the problem(s).
- Outline the vision (what should the regulatory process look like?)
- Draft rule language to achieve the group's vision.
- Test it by soliciting feedback in our own company, reviewing past applications and input from the OCD.

Summary of Our Efforts...

- 9/30/96: established a common vision.
- 10/21/96: finished first draft.
- 10/30/96: finished second draft.
- 11/7/96: finished third draft.
- 11/18/96: fourth draft.
- 12/2/96: presented to District Directors.
- 1/5/97: submitted to Mike Stogner.
- 3/3/97 & 4/4/97: met & considered comments, made additional changes.

Problems & Solutions



Problems With the Current Rule...

- Current process for permitting horizontal and directional wells is more difficult than it needs to be for most situations.
- Even though the bottomhole location is orthodox, an operator is required to file a formal application with several attachments, identify and give notice to offset operators, and wait at least 30 days to get a formal order.

How Can We Improve It?

- Identify those situations that can be permitted through the normal APD process.
- When the bottomhole location is unorthodox, handle it under Rule 104.
- Clarify when a directional survey will be required.

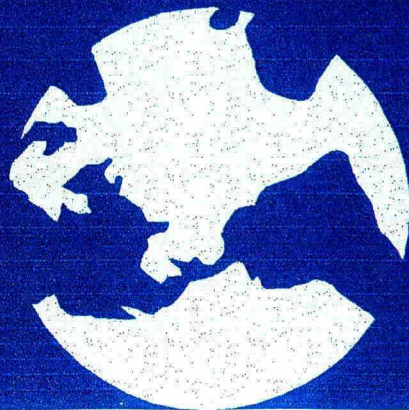
Problems With the Current Rule...

- The requirements for vertical wells with excessive deviation are unclear.
- When the deviation exceeds 5° per 500 feet, operators aren't sure if a directional survey will be required, or what happens after the directional survey results are known.

The Team's Vision

- Minimal regulatory burdens for drilling normal directional & horizontal wells.
- Protection of correlative rights of offsets by using Rule 104 if the producing interval is unorthodox.
- Clear requirements for vertical wells with excessive deviation.
- A simple rule.

The Current Rule 111



Structure

Rule 111

Definitions
Part A

Deviation Tests
Part B

Deviated Wellbores: Application & Approval Process
Part C

Directional Wellbores (Includes Horizontal)
Part D

Directional Wellbores: Application & Approval Process
Part E

Misc.
Part F

Key Definitions in Part A

- “Vertical” well
- “Deviated” well
- “Directional” well
- Producing interval
- Project area
- Producing area

What is a “Vertical” Well?

- A wellbore that is drilled without an intentional bottomhole location and without intentionally deviating from the vertical.

What is a “Deviated” Well?

- A well that is “intentionally” deviated from the vertical but not in any specific direction.

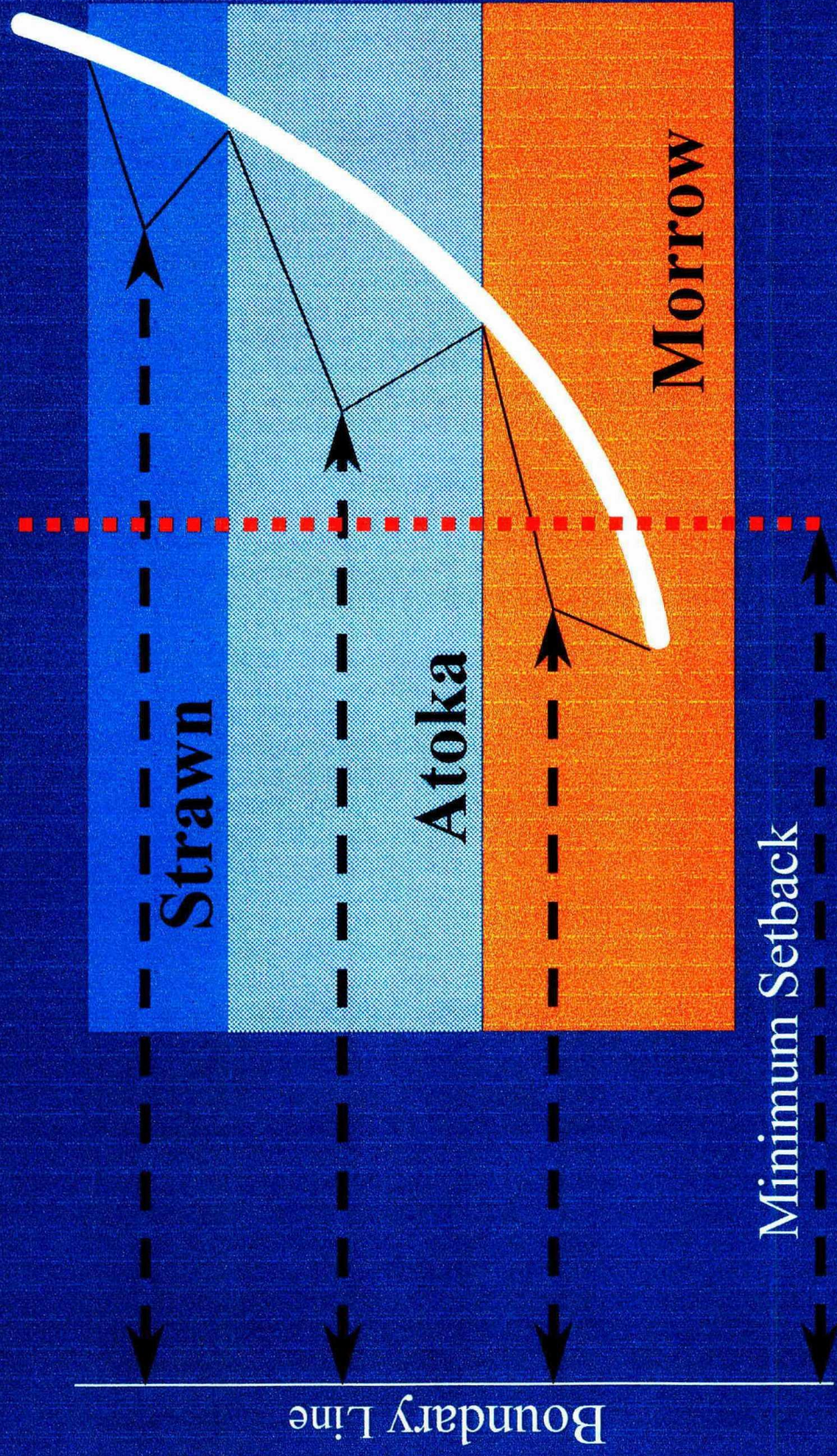
What is a “Directional” Well?

- A wellbore that is intentionally deviated in a specific direction.
- Horizontal wells are considered the same as directional wells.

“Producing Interval” Defined

- The part of the wellbore located within the vertical limits of a particular pool.
- Pool-specific

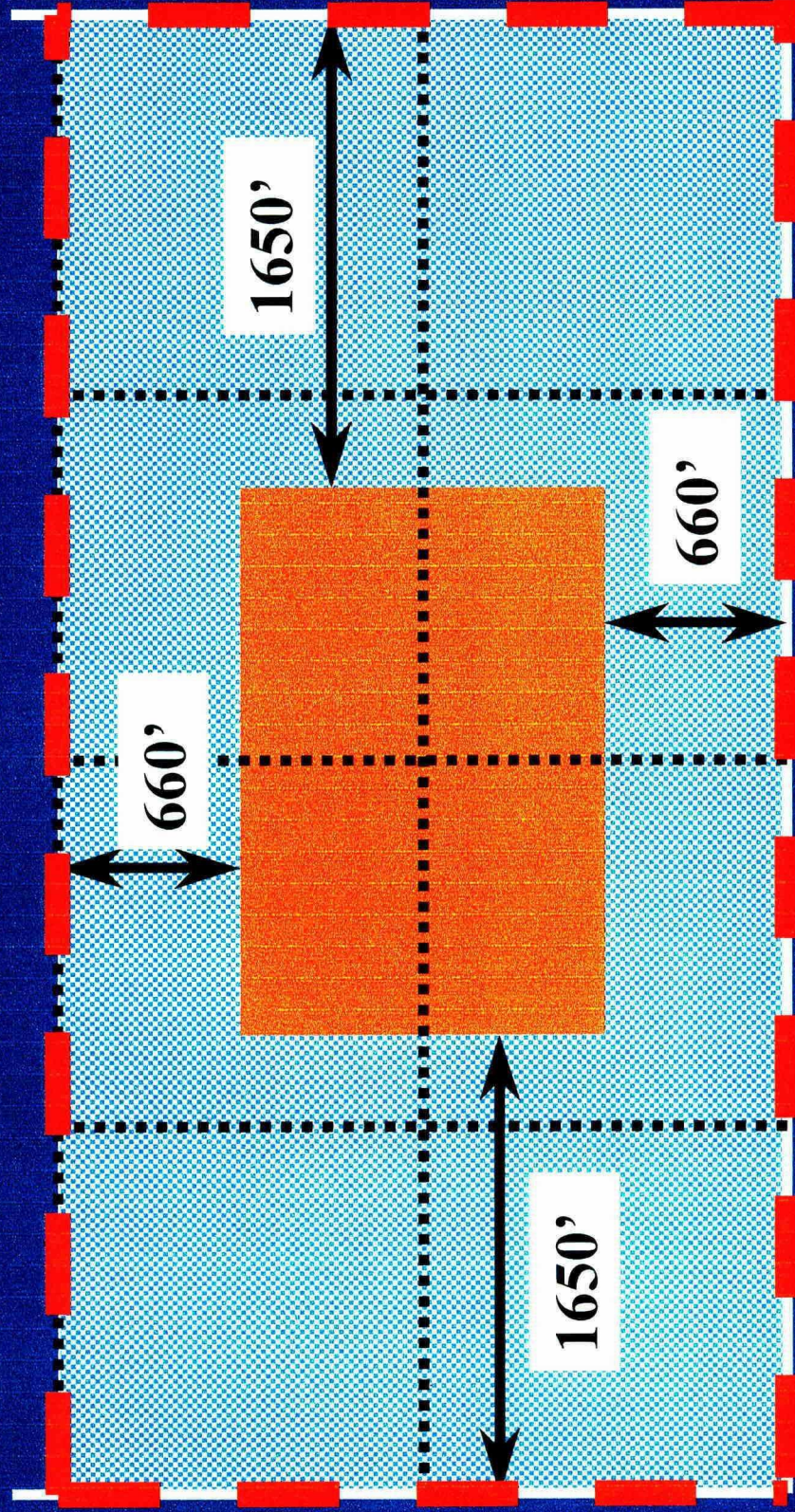
Example of a “Producing Interval”



“Project Area” & “Producing Area” Defined

- Project area = an area designated by the operator on the Rule 111 application.
- Project areas can be comprised of one or more drilling (proration) units.
- Producing area = the orthodox window as defined by the applicable minimum setbacks from the outer boundaries of the project area.
- The wellbore is unorthodox when the producing interval is outside the producing area.

“Project & Producing Areas” (Ex: one 320 acre unit)

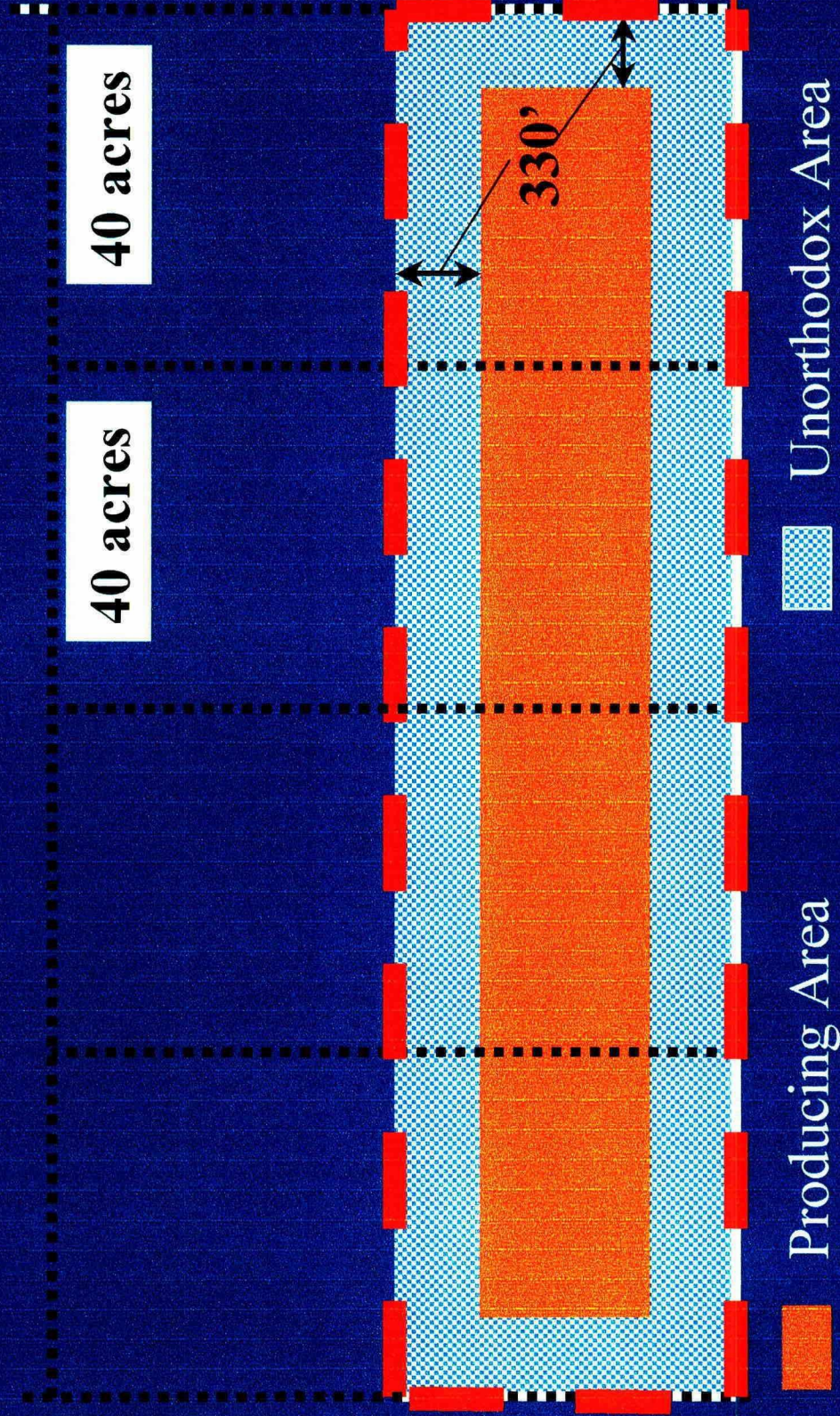


320 Acre Unit, Deep Gas, Southeast New Mexico

Producing Area

Unorthodox Area

“Project & Producing Areas” (Ex: Multiple 40 Acre Units)



Part B: Deviation Tests

- Operators must run deviation tests every 500 feet on any new drill or deepening.
- Deviation test information must be filed with the C-104.
- When the deviation exceeds 5° in any 500 foot interval, the operator must calculate the maximum horizontal displacement of the wellbore.
- The Division Director may require a directional survey for the wellbore.

Part C: The 50 Foot Rule...

- Rule 111 (C) (4) requires the producing interval of a deviated wellbore to be orthodox or within 50 feet of an approved location.
- This allowance does not apply to directional wellbores.

Part C: Application Process

- The OCD District Office can approve an operator's written request to deviate a wellbore for specific reasons.
- To deviate a wellbore for other reasons, an operator must file an application for administrative approval with plats, and give notice to offset operators and working interest owners (if applicable).
- Offsets have 20 days to protest before application can be processed.
- No one can recall when an application has ever been filed under this part of Rule 111.

Part D: Directional Wellbores

- “Directional” includes horizontal projects.
- NMOCD approval requires an application, plat, horizontal and plan views, type log, notice and opportunity for protest to all offset operators and working interest owners (if applicable).
- Offsets have 20 days to protest before application can be processed.

Part D (3): Allowables

- Maximum allowable for the project area is equal to the number of proration units located within X' of the wellbore.
- "X" is the minimum setback from the outer boundary applicable to a vertical well.
- For example, X would be 330 feet for an oil well in an oil pool under statewide rules.

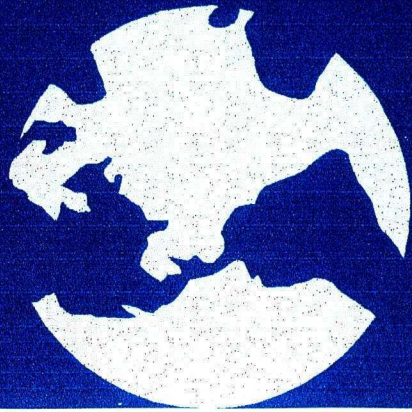
Part E: Conditions of Approval

- Applications for directional drilling authority can be approved after 20 days (if no one protests) or sooner if waivers are submitted.
- NMOCD orders shall require a directional survey, after notice to the District Office.

Part F: Misc.

- The Division Director can order an operator to run a directional survey, if an offset operator complains. The requesting party pays for the survey and posts a \$5000 indemnity bond.
- The Division Director can also set any directional drilling application for hearing, even if no one protests.

Discussion of new Rule 111



Structure of new Rule 111: Simplifier...

Rule 111

Definitions
Part A

Deviation Requirements for Straight-hole Wells
Part B

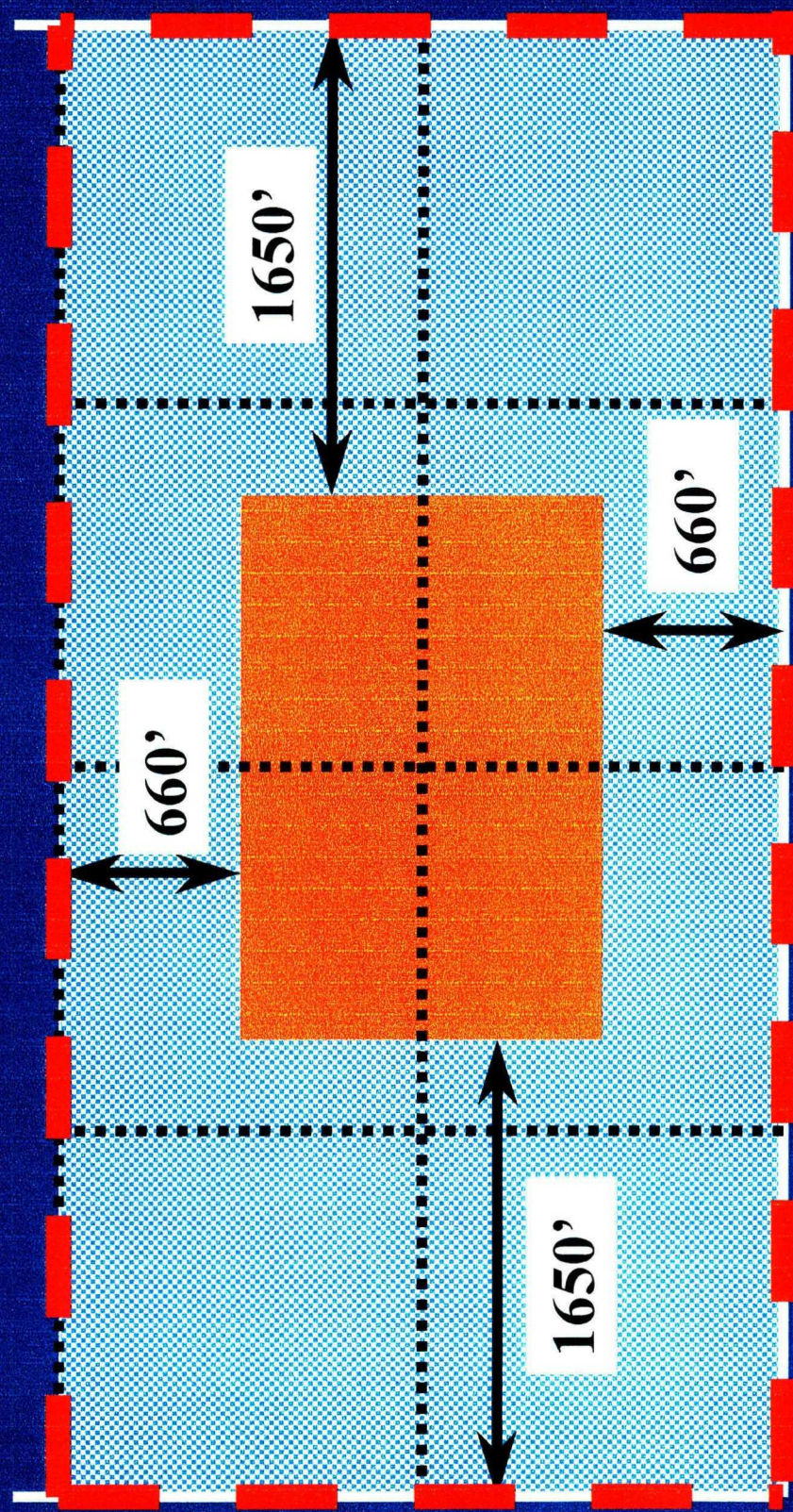
Requirements for Directional & Horizontal Wells
Part C

Misc.
Part D

Part A: Definitions

- “Project area” has been redefined to be the area designated by the operator on the C-102.
- In addition to being one or more drilling units, a “Project Area” can also be a secondary recovery unit or pressure maintenance project.
- “Unorthodox” is defined to mean encroachment to the outer boundaries only.

“Unorthodox” (Ex: one 320 acre unit)



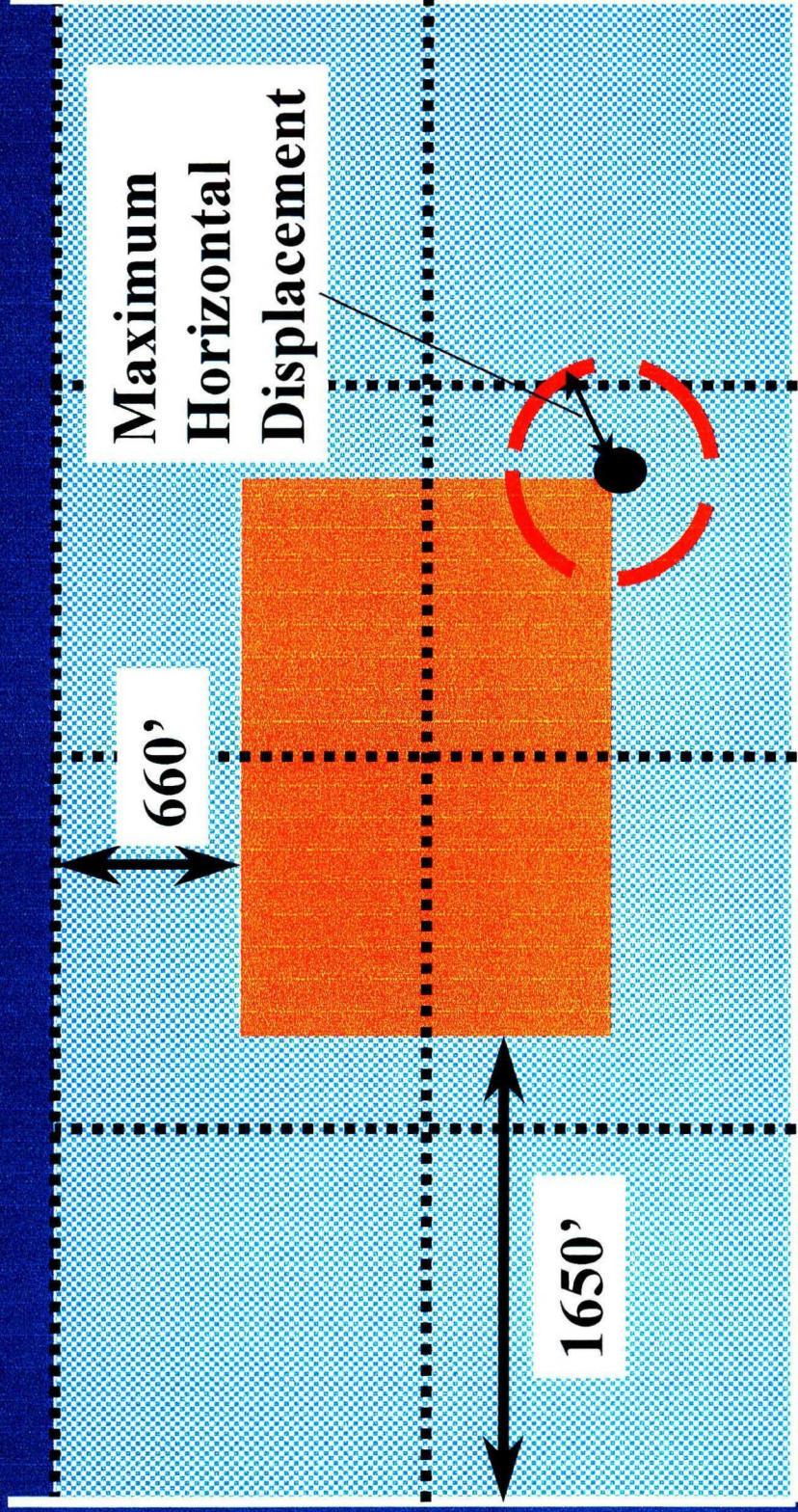
320 Acre Unit, Deep Gas, Southeast New Mexico

-  Producing Area
-  Unorthodox Area

Rule 111 (B): Deviation Tests

- States that a directional survey is required if there is a chance the wellbore is off-lease.
- Maintains the current 50' allowance.
- Clarifies that Rule 104 applies if the survey shows the wellbore is too close to the outer boundary.
- Requires all directional surveys to be filed; allows the NMOCD to order a directional survey in special situations.

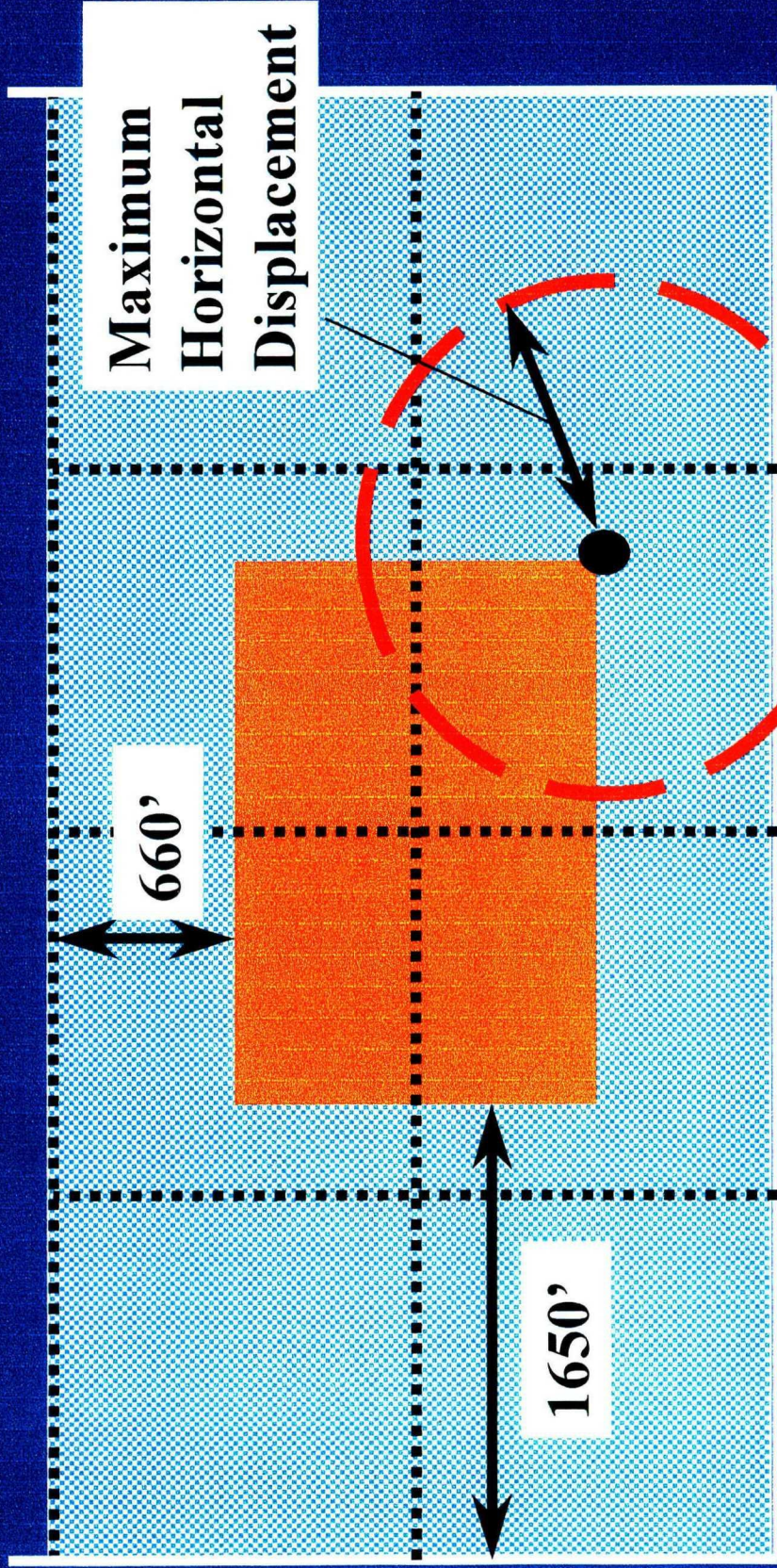
Ex: >5 Degree/500'; No Dir Survey Req'd



320 Acre Unit, Deep Gas, Southeast New Mexico

Producing Area Unorthodox Area

Ex: >5 Degree/500'; Dir Survey Req'd



320 Acre Unit, Deep Gas, Southeast New Mexico

Producing Area

Unorthodox Area

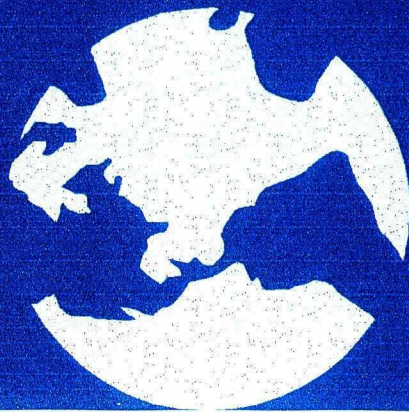
Part C: Directional & Horizontal Wells

- (1): District Office approval for “normal” wellbores using APD process.
- (2): Rule 104 applies if the wellbore encroaches on the outer boundary.
- (3): Allowables for projects that combine proration units.
- (4): Directional surveys req'd on any directional or horizontal well.

Part D: Miscellaneous

- (1): Describes how an offset operator can request a directional survey on another's well.
- (2): The Division Director can require any application to go through administrative approval process or be set for hearing.
- (3): Notice and opportunity for hearing are required for approval of any directional drilling project that is not addressed in the rule.

Comparison of the Two Versions



Definition of Project Area

Old Rule

- Project Area limited to one or more units.

New Rule

- Project Area now designated on C-102, and can be one or more units or a secondary recovery unit.

Definition of “Unorthodox”

Old Rule

- Not Defined
- 50' allowance for deviated wells only.

New Rule

- Defined to be when the producing interval encroaches on the outer boundary of the project area.
- 50' allowance language clarified, still for deviated wells only.

Excessive Deviation

Old Rule

- When excessive deviation requires an operator to submit maximum horizontal displacement calculations, it's unclear what happens next.

New Rule

- A directional survey is required **when the wellbore could be off-lease.**

Language for the “50 Foot Rule”

Old Rule

- Well is unorthodox if producing interval is found to be more than 50' from approved location or at unorthodox location.

New Rule

- Well is unorthodox if producing interval is found to be more than 50' from approved location **and encroaching on the outer boundaries of the spacing unit.**

Deviated Well Approval Process

Old Rule

- File a written request with the District Office and give notice as described in Part C.

New Rule

- Deleted.

Directional Well Approval Process

Old Rule

- Administrative approval process, initiated by an application and notice as described in Part D.

New Rule

- If the producing interval is orthodox, or at a previously approved unorthodox location, *the operator simply files an APD at the District Office.*

Unorthodox Location Approval Process

Old Rule

- An operator files an application and gives notice pursuant to Rule 104.
- Confusing, because an operator also has to file an application and give notice to get Rule 111 authority.

New Rule

- An operator files an application and gives notice pursuant to Rule 104.
- Part C (2) makes it clear that *Rule 104 applies if the producing interval is outside the producing area.*

Unplanned Unorthodox Directional Wells

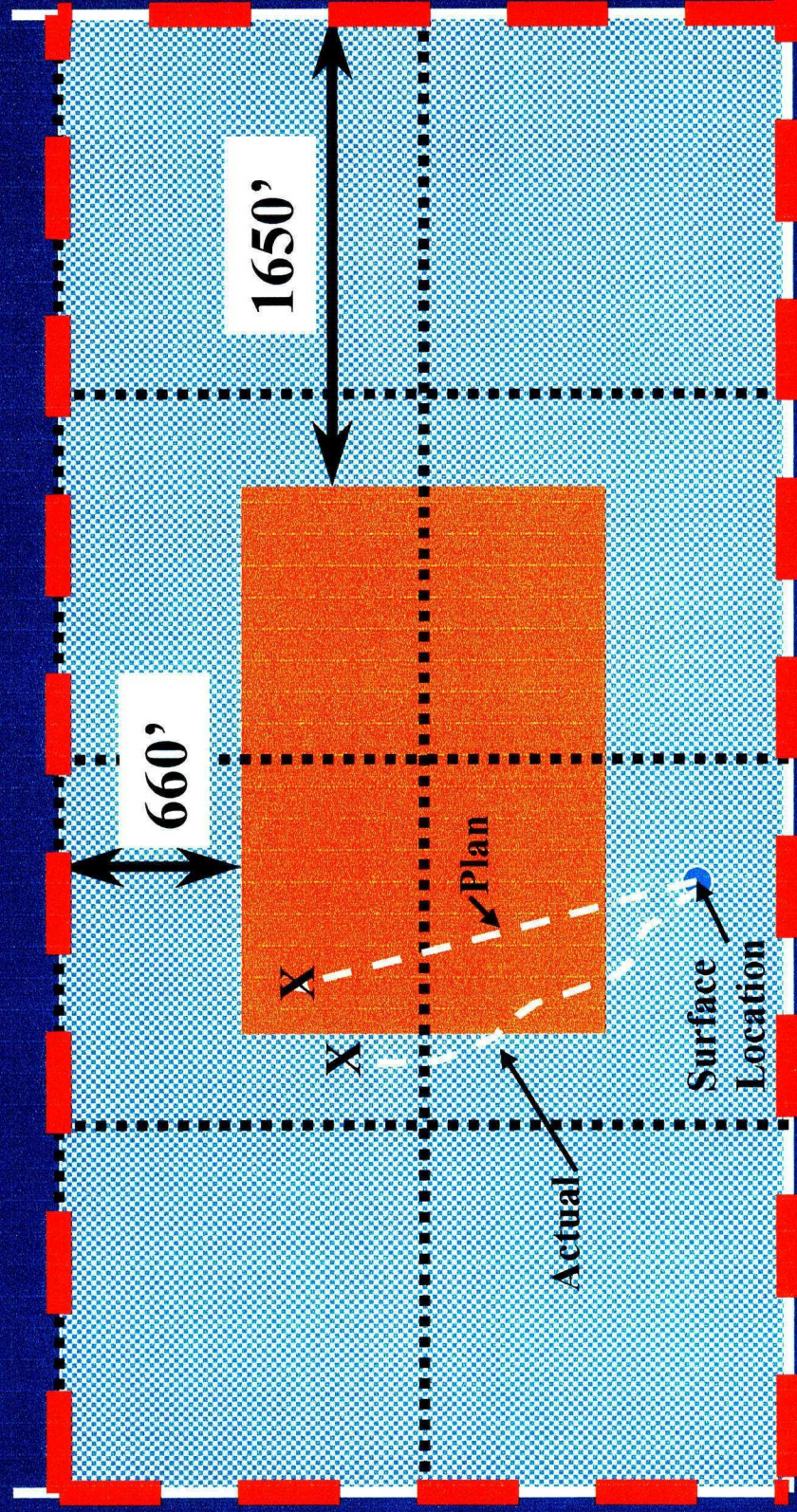
Old Rule

- ?

New Rule

- An operator must file an application and give notice pursuant to Rule 104.
- Approval must be secured before any allowable can be assigned to the well.

Ex: Unplanned Unorthodox Directional Well



320 Acre Unit, Deep Gas, Southeast New Mexico

Producing Area

Unorthodox Area

Allowables for Multiple Units

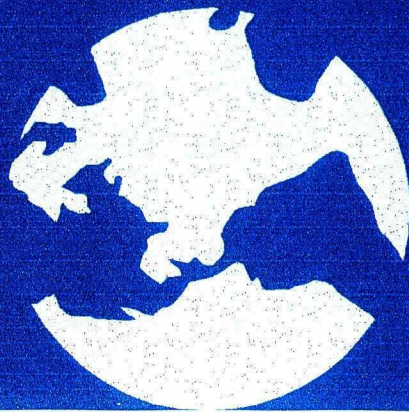
Old Rule

- For project areas with more than one proration unit, the maximum allowable is based on the subject unit and the units being encroached upon.

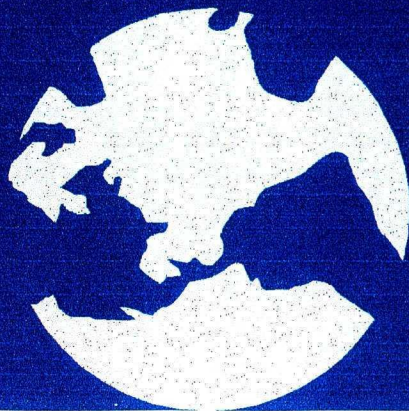
New Rule

- For project areas with more than one proration unit, the maximum allowable is based on the units *that are developed or traversed by the well's producing interval.*

Comparison of the Two Versions



Summary & Next Steps



What does all this accomplish?

- Excessive deviation requirements are clearer and can be uniformly applied.
- Horizontal wells are still treated the same as directional wells.
- The NMOCD District Offices are more empowered by the new permitting process, relieving Santa Fe staff of burdensome paperwork.

Excessive Deviation

Old Rule

- When excessive deviation requires an operator to submit maximum horizontal displacement calculations, it's unclear what happens next.

New Rule

- A directional survey is required **when the wellbore could be off-lease.**

Language for the “50 Foot Rule”

Old Rule

- Well is unorthodox if producing interval is found to be more than 50' from approved location or at unorthodox location.

New Rule

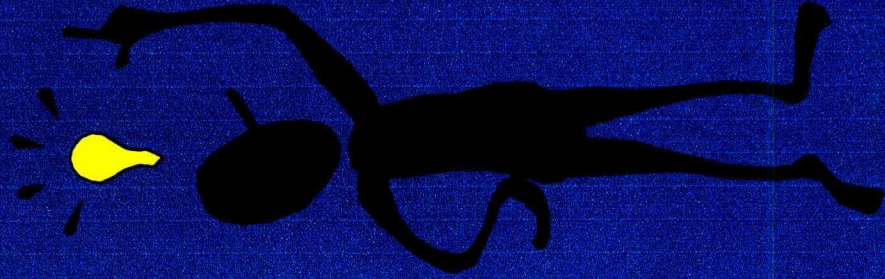
- Well is unorthodox if producing interval is found to be more than 50' from approved location *and encroaching on the outer boundaries of the spacing unit.*

How good are the improvements?

- No changes are needed for Federal and State forms.
- We reviewed almost 30 past applications; most would be unnecessary under proposed rule.
- The BLM has reviewed the proposed changes and has no objections.
- Broad support from industry after 60 days of review. No objections.

Ideas for next steps...

- Send out final draft for possible adoption 5/22/97.
- If uncomfortable, adopt the proposed changes and revisit after two years.
- Continue to utilize the Rule 111 work group as an industry resource to evaluate and make recommendations based on the submitted comments.



The End.....

