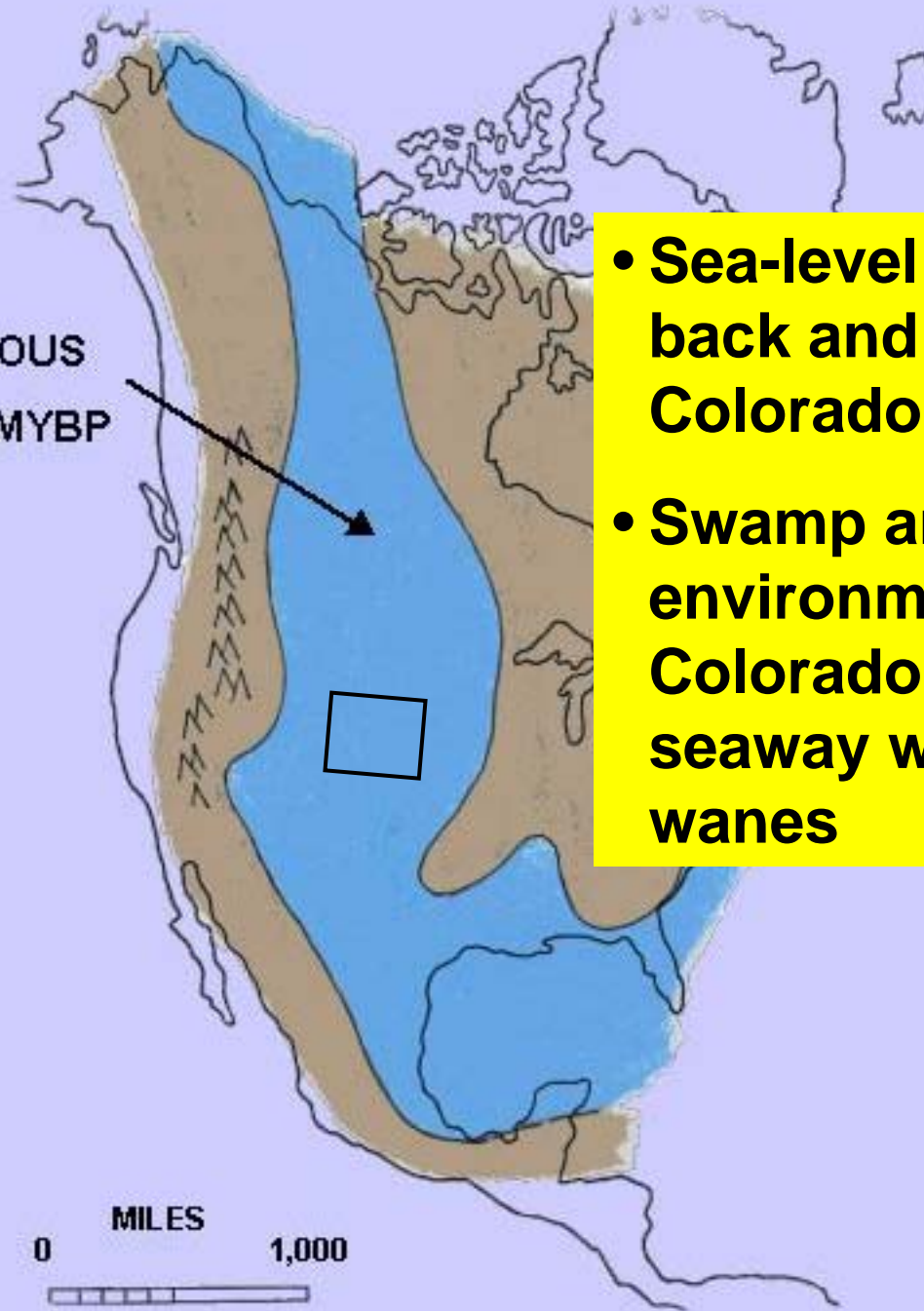


Oil & Gas Production and Produced Water In Colorado

Water Resources Review Committee
September 28, 2005
Denver, Colorado

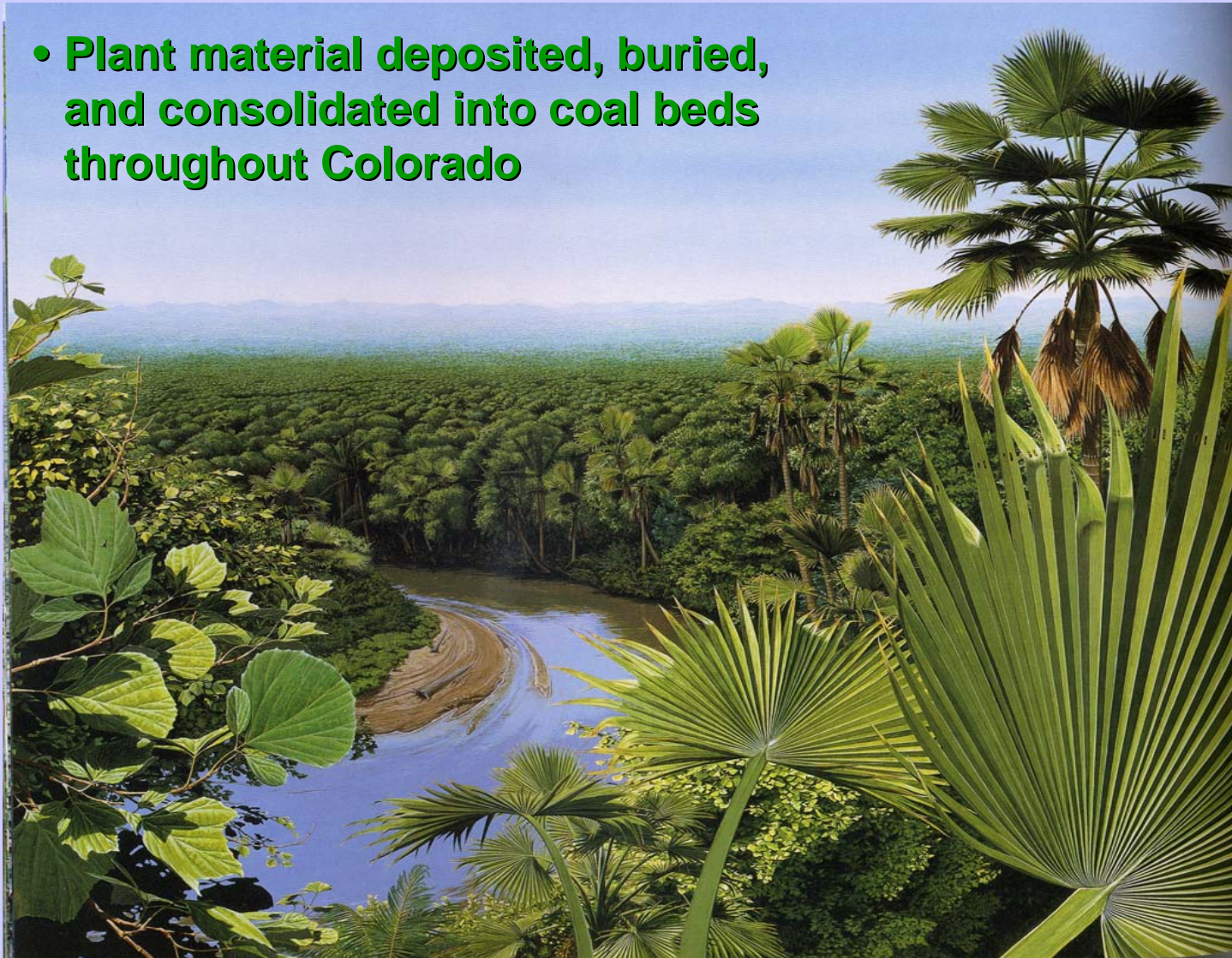


INTERIOR CRETACEOUS
SEAWAY ABOUT 65 MYBP



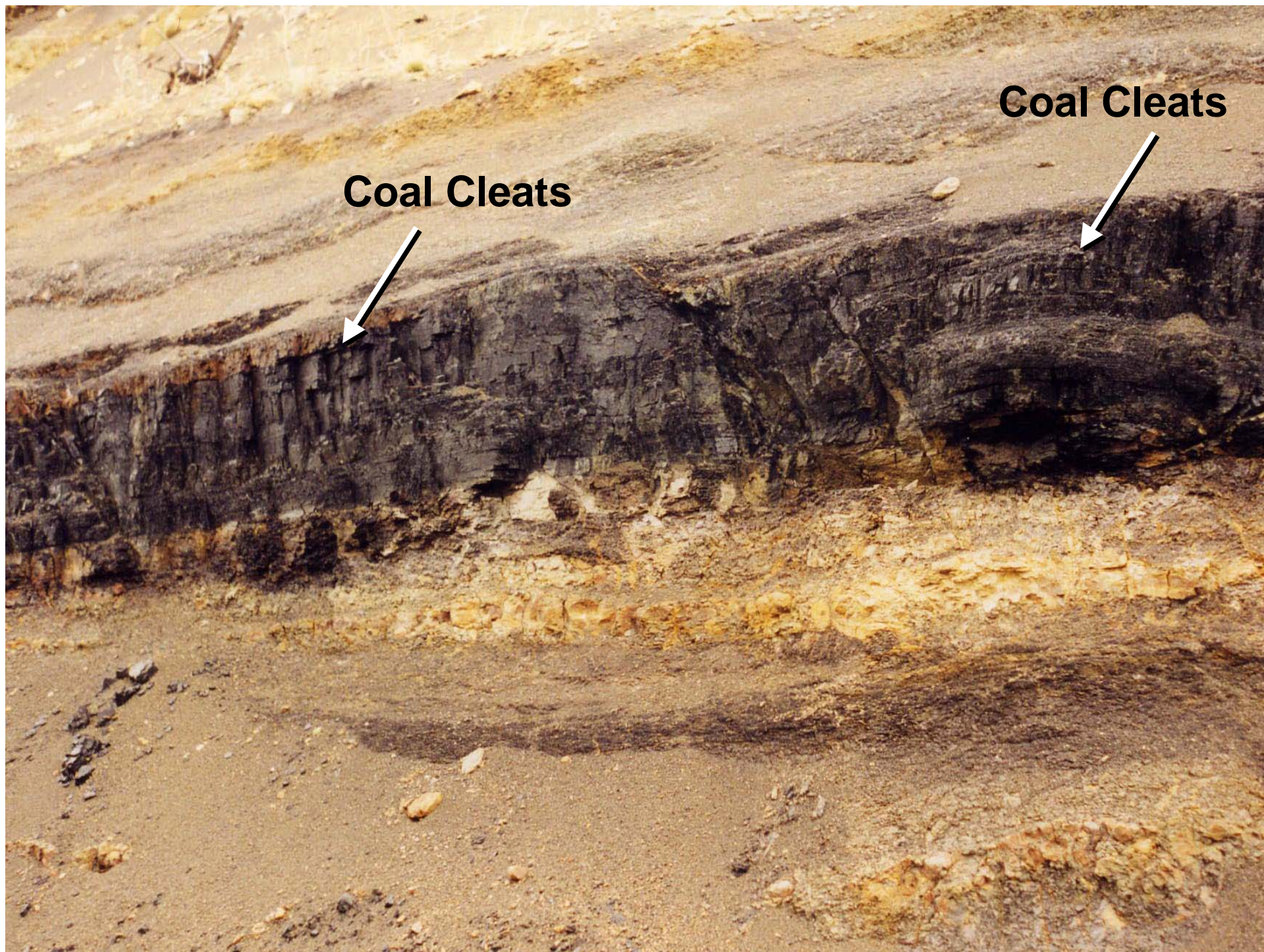
- **Sea-level fluctuated back and forth across Colorado**
- **Swamp and rainforest environments in Colorado as the seaway waxes and wanes**

- Plant material deposited, buried, and consolidated into coal beds throughout Colorado



FRONT RANGE OF COLORADO 65 MYBP

DENVER MUSEUM OF NATURE AND SCIENCE AND
DIANE BRAGINETZ WITH PERMISSION

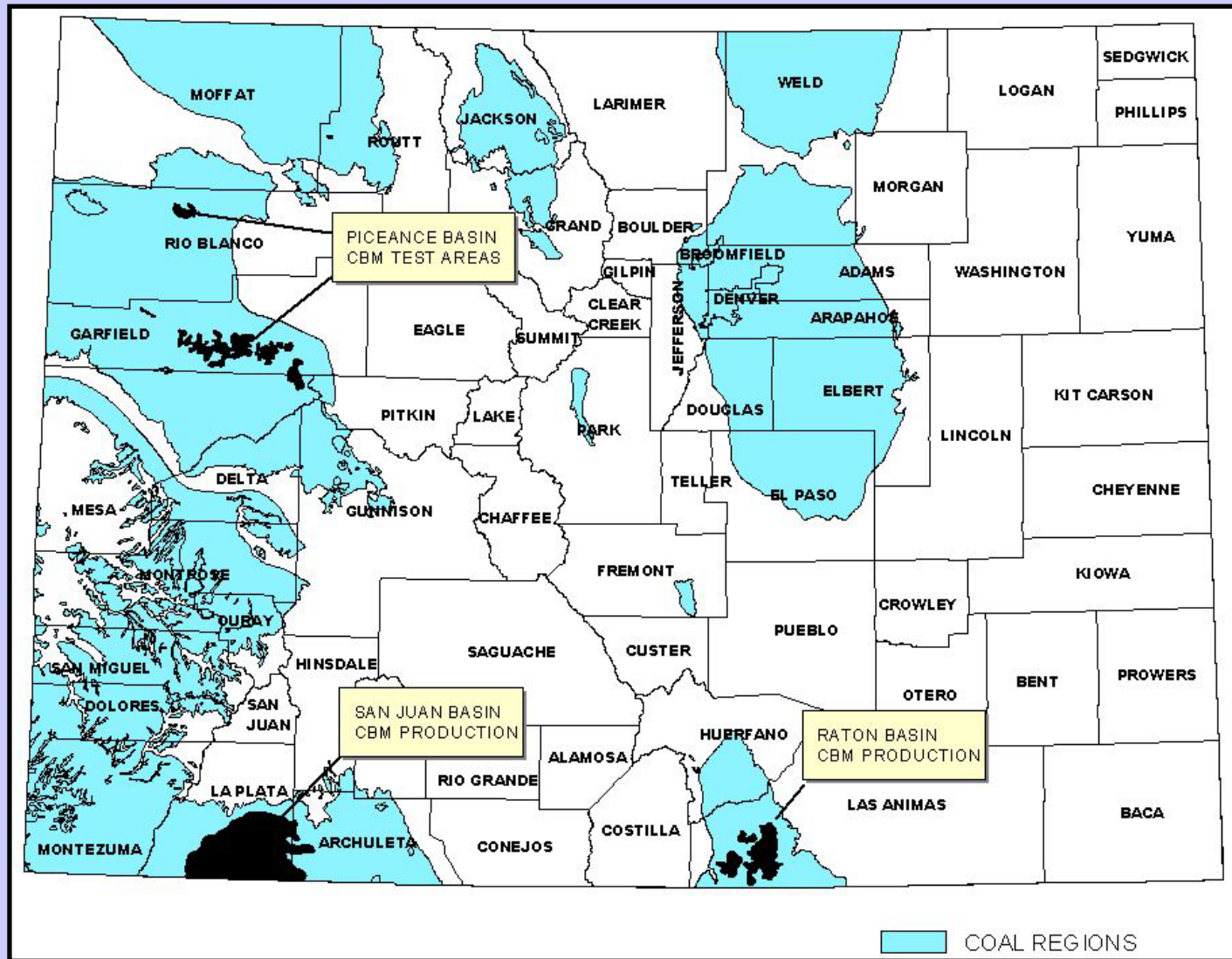


Coal Cleats

Coal Cleats

COALBED GAS IN COLORADO

3,855 WELLS



How is Coalbed Methane Extracted?

- **Methane gas is trapped in the coal beds by the pressure of water in the cleats (fractures)**
- **To release methane gas, water pressure is reduced by removing water from coal-bearing intervals**
- **Coal-bearing intervals can be interbedded with known aquifers, may be aquifers themselves, or are connected with surface water systems**

SIMPLIFIED COLORADO STRATIGRAPHIC NOMENCLATURE CHART

CRETACEOUS AND YOUNGER ROCKS WITH CBM POTENTIAL

| ERA | PERIOD | | YEARS BEFORE PRESENT | SAN JUAN BASIN | | | PICEANCE CREEK BASIN | RATON BASIN | DENVER BASIN | SAND WASH BASIN | NORTH PARK BASIN | | | | | | | |
|----------|-----------|--|----------------------|------------------|----------------|------------|----------------------|-------------|-----------------|-----------------|------------------|--------------------|--|----------------|--------------------|------------|-----------------------|----------------|
| CENEZOIC | PLIOCENE | | 11M | | | | | | | BROWNS PARK FM. | NO. PARK FM. | | | | | | | |
| | MIOCENE | | 25M | | | | | | | | | | | | | | | |
| | OLIGOCENE | | 40M | | | | | | | | | TERTIARY VOLCANICS | | | CASTLE ROCK CONGL. | | RABBIT EARS VOLCANICS | |
| | EOCENE | | 60M | | | | | | | | | SAN JOSE FORMATION | | UINTA FM | | DAWSON FM. | | GREEN RIVER FM |
| | PALEOCENE | | 65M | | | | | | | | | | | GREEN RIVER FM | | | | |
| | | | | ANIMAS FORMATION | | WASATCH FM | | WASATCH FM. | | COALMONT FM. | | | | | | | | |
| | | | | | FT UNION FM | | FT. UNION FM | | | | | | | | | | | |
| | | | | | OHIO CK CONGL. | | RATON FM VERMEJO FM | | OHIO CK. CONGL. | | | | | | | | | |
| | | | | | | | ARAPAHOE FM. | | | | | | | | | | | |
| | | | | | | | LARAMIE FM. | | LANCE FM. | | | | | | | | | |
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TYPICAL CBM WELL COMPLETION

