# Preliminary Geologic Map of the Bluewater Quadrangle, Cibola and McKinley Counties, New Mexico (Year 1 of 1-Year)

By

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### New Mexico Bureau of Geology and Mineral Resources Open-file Digital Geologic Map OF-GM 236

Scale 1:24,000

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#### Geology of the Bluewater Quadrangle, McKinley and Cibola Counties, New Mexico

Geologic compilation, aerial photograph interpretation, minor revisions, and digitization by Geoffrey. C. Rawling

Geology mapped by Robert. E. Thaden and Earl. J. Ostling, USGS

- af- Artificial fill for roads and cattle tanks
- daf Artificial fill and/or disturbed land
- mt Mounds of reclaimed mine tailings
- cbp Collapse/breccia pipes (Jurassic?)
- Qt Talus and landslide blocks
- Qal Alluvial deposits, undivided
- Qd Eolian sand in small dunes and sheets
- Qbc El Tintero cinder cone. Source of the Bluewater flow.
- Qbt Basalt flows from El Tintero—Data from drill holes indicate at least 5 separate flows aggregating 122 feet (37 m) in thickness are present in the southwestern part of the quadrangle.

#### Unconformity

- **Kma Lower part of the Mancos shale.** Gray sandy shale. Top eroded; about 20 feet (6m) remaining.
- Kd Dakota Sandstone. Pale yellowish-brown, moderate-orange, and light gray fineand medium-grained sandstone; interbedded lenticular dark-gray shale and coal beds near base. 50 to 100 feet (15 to 30 m) thick.

#### Unconformity

#### **Morrison Formation**

Jmb – Brushy Basin Member of Morrison Formation. Grayish-green mudstone with minor lenticular light- and yellowish-gray fine- and medium-grained sandstone. 45 to 100 feet (13 to 30 m) thick.

- Jmw Westwater Canyon Member of Morrison Formation. Light-, yellowish-, and reddish-gray fine and medium-grained sandstone. Minor light greenish-gray lenticular mudstone. 125 to 185 feet (38 to 56 m) thick.
- Jmwu upper part (Poison Canyon sandstone of economic usage). As much as 80 feet (24 m) thick, separated from lower part (Jmwl) by mudstone tongues and lenses as much as 25 feet (7 m) thick, which have the same characteristics as the Brushy Basin Member (Jmb). Mudstone mapped with upper part.
- Jmwl lower part. As much as 115 feet (35 m) thick.
- Jmr Recapture Member of the Morrison Formation. Interbedded variegated claystone, pale-green, brown, red, and purple siltstone, and white, pale yellow, green, and brown sandstone. 125 to 245 feet (38 to 74 m) thick. Lower part deposited against wedge of Cow Springs Sandstone (Jcs).
- Jcs Cow Springs Sandstone. Moderate orange-brown and pale-pinkish-brown finegrained cross-bedded eolian sandstone. Wedges out to east in north-central part of quadrangle. 0 to 150 feet (0 to 45 m) thick.
- **Jb Bluff Sandstone.** White and pale-orange, fine-grained cross-bedded sandstone. 110 to 125 feet (33 to 38 m) thick.
- Js Summerville Formation. Interbedded variegated mudstone, siltstone, and fine- to very fine-grained sandstone. About 175 feet (53 m) thick.
- **Jt Todilto Limestone.** Pale-olive-gray, dark olive-brown, and pale yellow limestone, thick-bedded, mostly recrystallized in top part, crinkly-bedded in middle part, and platy-bedded at base. 25 to 35 feet (7 to 10 m) thick.

#### **Entrada Sandstone**

- Jeu Entrada Sandstone, upper sandy member. Moderate brown fine-grained crossbedded sandstone. 135 – 140 feet (41 to 42 m) thick.
- Jem Entrada Sandstone, medial silty member. Grayish red-brown calcareous siltstone. 45 to 50 feet (13 to 15 m) thick.

#### Unconformity

**Rw** – Wingate Sandstone. Moderate brown to moderate reddish-orange medium-grained crossbedded sandstone. Base not exposed. About 120 feet (36 m) thick.

#### **Chinle Formation**

- Fcu Upper Member. Dark purplish-red and pale bluish-gray limy siltstone interbedded with olive-gray to dark greenish-gray silty limestone in upper 180 feet (54 m). Reddish-brown even-bedded siltstone in lower 150 feet (45 m).
- Fcc Correo Sandstone Member. Pale grayish-red fine-grained cross-bedded arkosic sandstone and minor interbedded gray to pale brown pebble conglomerate. About 75 feet (22 m) thick.
- **Fcm Middle Member.** Reddish-brown even-bedded siltstone. About 400 feet (121 m) thick.
- **R**cs Sonsela Sandstone Bed of Petrified Forest Member. White, pale yellowishbrown, yellow, and brown conglomeratic sandstone interbedded with white, blue, purple and brown claystone. 290 feet (88 m) thick.
- Fcl Lower Member. Variegated clayey and sandy siltstone interbedded with lenticular white, yellow, purple, and brown cross-bedded conglomeratic sandstone. About 300 feet (91 m) thick.

#### Unconformity

**Rm** – **Moenkopi Formtion.** Pale reddish-brown and grayish-red arkosic and micaceous sandstone interbedded with lenticular pebble conglomerate and layers of mudstone galls. Cross-bedded near top, horizontally-bedded near base. About 26 feet (8 m) thick.

#### Unconformity

- Ps San Andres limestone. Grayish-yellow and brown to red dense limestone interbedded with yellow fine-to medium-grained, cross-bedded to structureless sandstone in upper part, 80 feet (24 m) thick. Yellow sandstone similar to that above in middle part, 15 feet (4.5 m) thick. Dense, gray limestone with streaks and zones of coarse-grained calcite in lower part, 20 feet (6 m) thick. Upper surface is karst. Total thickness 115 feet (35 m).
- Pg Glorieata Sandstone. Cross-section only.
- pPyu Yeso formation and older rocks. Cross-section only.