

APPENDIX I:

**MEASURED STRATIGRAPHIC SECTIONS,
MISSISSIPPIAN MADISON LIMESTONE, SOUTHERN
FLANK OF THE UINTA MOUNTAINS**

Study Site 2 – Madison Limestone, Dry Fork Canyon (Red Cloud Loop/North Fork Intersection), Section 26, T. 2 S., R. 19 E., Uintah County, Utah

Unit	Unit (feet)	Total (feet)	Description
8	2	41.5	Dolomite; light brown to buff, mudstone, with continuous mm scale cryptalgal laminates, possible desiccation cracks and rip-up clasts, no fossils, probable pellets, dolomite is microcrystalline, low porosity and probably low permeability, depositional environment – tidal-flat mud.
7	13	39.5	Dolomite; light to medium brown, oolitic grainstone, fine to medium crystalline, low to medium angle cross-stratification, upper surface appears to be rippled to channelized with “cookie chip-like” mud clasts and fossil fragments in the troughs, local nodular calcite masses may be relic evaporite structures, very good porosity and permeability, depositional environment - oolitic shoal.
6	5	26.5	Limestone; light blue gray, pelloidal/skeletal/packstone/grainstone with endothryid forams and other microfossils, thin bedded to bioturbated, no visible matrix porosity, depositional environment - stable shallow subtidal bay.
5	4	21.5	Dolomite; medium brown, slightly calcareous, soft pellet mudstone, no visible fossils, massive to heavily bioturbated, strong petroliferous odor, micro-intercrystalline dolomite with moderately high porosity and probably low permeability, may contain significant organic matter, sharp base, high-order cycle boundary (shoaling up), depositional environment – deeper subtidal burrowed pellet muds.
4	2	17.5	Dolomite; light to medium brown, soft pellet mudstone with crinkly continuous cryptalgal laminates, minor amounts of skeletal microfossils including ostracods and benthic forams, probable rip-up intraclasts, finely crystalline, low porosity and probably low permeability, recessively weathered, depositional environment - tidal flat mud.
3	7.5	15.5	Dolomite; light to medium gray, oolitic/hard pellet grainstone, well-defined bedding, small- to medium-scale cross-bedded, closely spaced swarms of vertical fractures, no visible fossils, fine to medium crystalline, moderate porosity, probably low permeability, depositional environment - oolitic shoal.
2	2.5	8	Dolomite; calcareous, medium brown and gray, pelloidal/skeletal packstone/grainstone with hard pellets, benthic forams, and other microfossils, wavy bedded to bioturbated, top may be channelized, no visible porosity, probably low permeability, depositional environment - stable shallow subtidal bay.
1	5.5	5.5	Dolomite; calcareous, light brown to brown gray, oolitic/hard pellet grainstone, distinctive pocked marked weathering, well laminated at the centimeter scale probably due to grain size and early cementation differences, well-defined planar to low-angle cross-stratification, upper 6 inches may contain beach rock and semi-lithified rip-up clasts, no visible porosity, probably low permeability, contact with unit 2 above is sharp, thickness to base (covered), depositional environment - beach/foreshore.

Study Site 3 – Madison Limestone, Crouse Reservoir/Diamond Mountain Plateau, S1/2 Section 34, T. 1 S., R. 24 E., Uintah County, Utah

Unit	Unit (feet)	Total (feet)	Description
11	7	116.5	Limestone; light gray, grainstone (encrinite), well sorted coarse sand to granule size crinoid fragments, wavy-thin to medium bedding, upper contact not exposed, depositional environment - storm-dominated outer shelf crinoid shoals.
10	12	109.5	Limestone; light medium gray, skeletal wackestone/packstone with tubular tempestites, within muds are well-preserved articulated crinoid columnals, fenestrate bryozoans, depositional environment – low-energy open marine outer shelf above storm wave base.
9	9	97.5	Limestone; interbedded light to medium gray, soft peloid/crinoid wackestone/packstone and grainstone (encrinite), medium- to large-scale cross-stratification including bimodal or herringbone cross bedding, locally well-sorted medium- to coarse-grained crinoid fragments, local concentrations of partially silicified burrows, includes several 6-inch to 2-foot tidally dominated, bimodally well sorted, cross-bedded skeletal grainstone beds, ledge former across the landscape, depositional environment - storm-dominated outer shelf crinoid shoals to low-energy, open marine, muddy intershoal.
8	28	88.5	Limestone; light medium gray, skeletal wackestone/packstone with tubular tempestites, within muds are well-preserved articulated crinoid columnals, fenestrate bryozoans, locally abundant nodular cherts, biogenic graded with increasing mud content and decreasing crinoids upward, depositional environment – low-energy open marine outer shelf above storm wave base.
7	9	60.5	Limestone; light gray, grainstone (encrinite), well sorted, very coarse grained crinoid fragments and large crinoid columnals, wavy bedding and possible medium-scale cross-bedding, locally burrowed with some chert replacement, depositional environment - storm-dominated outer shelf crinoid shoals.
6	5.5	51.5	Limestone; light medium gray, skeletal wackestone/packstone with tubular tempestites, within muds are well-preserved articulated crinoid columnals, fenestrate bryozoans, depositional environment – low-energy open marine outer shelf above storm wave base.
5	8	46	Limestone; light gray, grainstone (encrinite), well sorted coarse sand to granule size crinoid fragments, wavy-thin to medium bedding, depositional environment - storm-dominated outer shelf crinoid shoals.
4	10	38	Limestone; light medium gray, skeletal wackestone/packstone with grainstone burrow infills, contains biogenetically skeletal burrow fillings at several scales, the larger burrow networks appear to be open burrows filled with coarse storm-pumped shells (tubular tempestites), within muds are well-preserved articulated crinoid columnals, also present are fenestrate bryozoans, locally abundant nodular cherts probably following burrow systems, depositional environment – low-energy open marine outer shelf above storm wave base.
3	9	28	Limestone; white to very light gray, skeletal grainstone, coarse grained, consists of crinoid and other skeletal fragments, well-developed syntaxial calcite cements, wavy medium-scale bedding; depositional environment - storm-dominated outer shelf crinoid shoals.
2	12	19	Limestone; light to medium gray, soft peloid/crinoid wackestone/packstone, appears to be burrowed, some well-preserved fenestrate bryozoans, mostly covered so poorly exposed, depositional environment – low-energy, open marine, muddy intershoal.
1	7	7	Limestone; light gray, grainstone (encrinite), well sorted coarse sand to granule size crinoid fragments, wavy-thin to medium bedding, upper contact is sharp with undulatory topography, possible small-scale interference ripples and small rugose corals on top, base not exposed, depositional environment - storm-dominated outer shelf crinoid shoals.