DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
NEVADA BUREAU OF MINES

MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-578

Base from U.S. Geological Survey 1:62,500, 1950-51

SCALE 1:48 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT HALF-INTERVAL CONTOURS
DATUM IS MEAN SEA LEVEL

AREA OF THIS REPORT

Geology by Donald H. Whitebread, 1956-65, and Allan B. Griggs, 1956-57; assisted by James W. Mytton, 1958, and William B. Rogers, 1959

EXPLANATION

- Qd — Sand dunes
- Qal — Younger alluvium
- Qr — Rock glacier
- Qt — Talus and colluvium
- Qls — Landslide. *Formations involved in landslide are distinguished locally*
- Qg — Glacial moraine
- Qlu, Qlb — Fluvial lake deposits. *Qlu; undifferentiated clay, silt, and sand. Qlb; beach, bar and spit deposits*
- QTal — Alluvium
- Tc — Conglomerate. *Locally includes displaced masses of Paleozoic rocks*
- Tnr — Needles Range Formation
- Tco — Older conglomerate
- md — Mafic dikes
- rd — Rhyolite porphyry dikes and sills
- Quartz vein
- K*p*m — Porphyritic quartz monzonite
- K*g*m — Quartz monzonite
- Pa — Arcturus Formation
- PPMe — Ely Limestone
- Mc — Chainman Shale
- Mj — Joana Limestone. *UNCONFORMITY*
- MDp — Pilot Shale
- Dg — Guilmette Formation
- Ds — Simonson Dolomite
- Dse — Sevy Dolomite. *UNCONFORMITY*
- SOlf — Laketown and Fish Haven Dolomites, undivided. *UNCONFORMITY*
- Oe — Eureka Quartzite
- Ol, Ok — Lehman Formation and Kanosh Shale. *Ol, Lehman Formation; Ok, Kanosh Shale; Olk, Lehman and Kanosh Formations, undivided*
- Ojf — Juab, Wahwah, and Fillmore Limestones of Hintze (1951), undivided
- OCh — House Limestone
- Cnp — Notch Peak Limestone
- Ccs — Corset Spring Shale
- Cjw — Johns Wash Limestone
- Clp — Lincoln Peak Formation
- Cpcs, Cpcd, Cpcc, Cpcb, Cpca — Cpc — Pole Canyon Limestone. *Includes 5 members, A (at base) through E (at top)*
- Cp — Pioche Shale
- Cpm — Prospect Mountain Quartzite
- pCo — Osceola Argillite of Misch and Hazzard (1962)
- pCs — Shingle Creek Quartzite

Contact. *Dashed where approximately located*

Fault, showing dip. *Dashed where approximately located; short dashed where indefinite or inferred; dotted where concealed. Bar and ball on downthrown side*

Decollement. *Major low-angle fault that has displaced younger rocks over older rocks. Deformation in the detached allochthonous complex is more or less independent from that in the autochthonous substratum. Sawtooth on upper plate. Dashed where approximately located; short dashed where indefinite or inferred; dotted where concealed*

Low angle fault. *Dashed where approximately located; short dashed where indefinite or inferred; dotted where concealed*

Anticline. *Showing trace of axial plane and bearing and plunge of axis. Dashed where approximately located*

Syncline. *Showing trace of axial plane and bearing and plunge of axis. Dashed where approximately located*

Plunge of minor anticline

Horizontal fold axis

Strike and dip of beds

Strike and dip of overturned beds

Strike of vertical beds

Horizontal beds

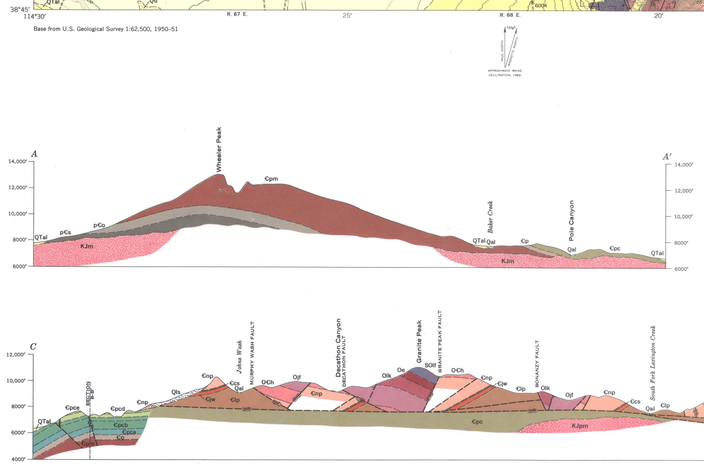
Strike and dip of foliation

Shaft

Adit

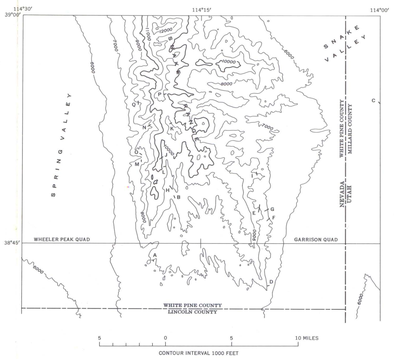
Trench

Prospect pit



GEOLOGIC MAP OF THE WHEELER PEAK AND GARRISON QUADRANGLES, NEVADA AND UTAH

By
Donald H. Whitebread
1969



MAP SHOWING LOCATION OF MEASURED STRATIGRAPHIC SECTIONS

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1969—68837E

For sale by the U.S. Geological Survey, price $1.00
Explanatory pamphlet accompanies map

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

TO ACCOMPANY MAP I-578

GEOLOGIC MAP OF THE WHEELER PEAK AND GARRISON QUADRANGLES, NEVADA AND UTAH

By Donald H. Whitebread

DESCRIPTION OF MAP UNITS

Qd **SAND DUNES**—composed chiefly of quartz and pellets of calcareous lake silt; most of the dune material derived from nearby areas of deflation.

Qal **YOUNGER ALLUVIUM**—unconsolidated silt, sand, and gravel, mostly confined to stream channels.

Qr **ROCK GLACIER**—poorly sorted angular blocks; includes an active and an inactive part. Blocks in the active portion are probably cemented by ice a short distance below the surface. Separated from the head of the cirque by glacial ice.

Qt **TALUS AND COLLUVIUM**—generally distinguished only where bedrock contacts or faults are obscured for long distances.

Qls **LANDSLIDE**—chaotic mass of blocks of various sizes. Formations involved in the landslide are distinguished locally.

Qg **GLACIAL MORAINE**—chiefly ground moraine. Includes deposits of two glacial stages. Younger morainal surfaces are hummocky, whereas older morainal surfaces have a more subdued topography.

Qlu **UNDIFFERENTIATED CLAY, SILT, AND SAND**—fine-grained sediments deposited in pluvial lake that once covered most of Spring Valley. Chiefly light-gray silt and clay, commonly calcareous. In places forms extensive playa, but elsewhere is slightly dissected.

Qlb **BEACH, BAR, AND SPIT DEPOSITS**—chiefly gravel and sand composed of material derived from the adjacent ranges. Deposits near the south end of Spring Valley contain much volcanic detritus.

QTal **ALLUVIUM**—includes fanglomerates, other fluvial gravel and sand, glaciofluvial deposits, some younger alluvium, and possibly some older conglomerate and older lake deposits.

Tc **CONGLOMERATE**—conglomerate, sandstone, and a few beds of light-gray tuff. Conglomerate locally contains cobbles of welded tuff. Locally includes displaced masses of Paleozoic rocks.

Tnr **NEEDLES RANGE FORMATION**—ash-flow tuffs of rhyodacite and quartz latite. Two cooling units exposed in mapped area. Upper member is pale-red to pale-grayish-red crystal-vitric welded tuff; lower member is light-gray to moderate-pink crystal-vitric nonwelded tuff. Complete section not present. Age considered to be Oligocene based on a K-Ar date of 31 ± 1.6 m. y. (U.S. Geol. Survey, written commun., Aug. 24, 1962).

Tco **OLDER CONGLOMERATE**—conglomerate, sandstone, and tuff. Conglomerate contains subrounded to angular pebbles of limestone, dolomite, quartzite, chert, and quartz monzonite. Some beds of sandstone are greenish gray and contain abundant celadonite. Light-gray tuff beds are as much as 10 feet thick.

md **MAFIC DIKES**—medium-dark-gray to dark-greenish-gray, fine-grained; composed chiefly of hornblende and feldspar; sparse biotite or pyroxene in some dikes; albite, chlorite, and calcite are common alteration products; mostly less than 10 feet wide.

rd **RHYOLITE PORPHYRY DIKES AND SILLS**—light-colored, fine-grained; phenocrysts of quartz, sanidine, plagioclase, and minor biotite in a microcrystalline groundmass; commonly extensively altered; mostly 3–10 feet wide, but a few about 100 feet wide.

KJpm **PORPHYRITIC QUARTZ MONZONITE**—quartz monzonite, light-olive-gray to light-gray, medium- to coarse-grained; composed of about 30 percent quartz, 39 percent plagioclase, 22 percent potassium feldspar, 8 percent muscovite and biotite, and 1 percent accessory minerals. Potassium feldspar phenocrysts commonly are 1/4–1/2 inch long.

KJm **QUARTZ MONZONITE**—quartz monzonite, light-gray, medium- to coarse-grained, equigranular; locally grades to granodiorite; composed of 28–37 percent quartz, 31–46 percent plagioclase, 9–34 percent potassium feldspar, and 3–9 percent biotite and muscovite. Accessory minerals are apatite, zircon, sphene, epidote, allanite, monazite, garnet, magnetite, and ilmenite. Includes some aplite dikes.

Pa **ARCTURUS FORMATION**—calcareous sandstone and sandy limestone, light-brownish-gray to yellowish-gray; beds 1–3 feet thick with thin ledge-forming interbeds. Exposed only near southeast corner of map.

PIPMe **ELY LIMESTONE**—limestone, light-gray to medium-light-gray, organic detrital; chert common; thick-bedded limestone commonly alternates with very thin bedded ledge-forming units. Complete section not exposed; estimated thickness 1,800–2,700 feet.

Mc **CHAINMAN SHALE**—shale and siltstone, dark-gray to pale-yellowish-brown; some beds of sandy limestone and calcareous sandstone; upper part is alternating shale and sandstone. Complete section not exposed; estimated thickness 1,000–2,000 feet.

Mj **JOANA LIMESTONE**—limestone, medium-gray, organic detrital, mostly massive, upper part thinner bedded; nodules and stringers of chert locally abundant; 3–10 feet of quartzite at base. No complete section in map area; estimated thickness 400 feet.

MDp **PILOT SHALE**—calcareous siltstone and calcareous and noncalcareous shale, dark-gray to olive-gray, platy; some beds of medium-dark-gray limestone; upper part is interbedded silty limestone and limestone. Thickness variable, estimated 400–800 feet.

Dg **GUILMETTE FORMATION**—limestone, medium-dark-gray, thin-bedded to massive; argillaceous partings common in thin-bedded units; dolomite becomes more common in upper part. No complete section exposed in map area; estimated thickness about 2,500 feet.

Ds **SIMONSON DOLOMITE**—dolomite, medium-light-gray to medium-dark-gray, microcrystalline to coarsely crystalline; lower part is light-brownish-gray coarsely crystalline dolomite. 575 feet thick.

Dse **SEVY DOLOMITE**—dolomite, medium-gray to medium-light-gray, microcrystalline to very finely crystalline; well-defined beds 3–24 inches thick; several beds of quartzite and sandy dolomite near top. Estimated thickness 800 feet.

SOlf **LAKETOWN AND FISH HAVEN DOLOMITES, UNDIVIDED**—dolomite, light-gray to dark-gray; beds generally poorly developed or obscured by fractures; chert locally abundant; thin unit of dolomitic sandstone at base. Thickness about 1,500 feet.

Oe **EUREKA QUARTZITE**—quartzite and sandstone, very light gray, fine- to medium-grained. 440 feet thick.

Ol **LEHMAN FORMATION**—limestone and silty limestone, medium-dark-gray; beds mostly 1/2–4 inches thick; silty partings and interbeds common; two or more beds of calcareous sandstone in upper half. 450 feet thick.

Ok **KANOSH SHALE**—shale, yellowish-brown to olive-gray, fissile; contains beds and lenses of limestone. 470 feet thick.

Ojf **JUAB, WAHWAH, AND FILLMORE LIMESTONES OF HINTZE (1951), UNDIVIDED:**

Juab and Wahwah Limestones—limestone, medium-gray to medium-dark-gray, very fine grained to coarsely clastic, thin- to thick-bedded; interbeds, partings, and knots of shale; about 400 feet thick.

Fillmore Limestone—limestone and shaly limestone, generally very thin bedded; interbeds and partings of grayish-orange to olive-gray shale; beds of limestone-pebble intraformational conglomerate are distinctive. Complete unfaulted section not exposed in map area; about 1,500 feet thick.

O€h **HOUSE LIMESTONE**—limestone, medium-dark-gray, thin- to thick-bedded, locally massive; chert common; silty material coats many bedding planes; basal part contains distinctive beds of organic detrital limestone. 850–900 feet thick.

€np **NOTCH PEAK LIMESTONE**—limestone, medium-gray, massive; nodules and lenses of chert common; locally dolomitized; basal part thin bedded and silty. About 1,600–1,800 feet thick.

€cs **CORSET SPRING SHALE**—shale, light-olive-gray, fissile; beds and lenses of coarsely clastic limestone in lower half; discoidal nodules of medium-gray limestone in upper half. 70 feet thick.

€jw **JOHNS WASH LIMESTONE**—limestone, medium-dark-gray to medium-light-gray, thin-bedded to massive; commonly mottled with calcite blebs; some beds coarsely clastic and locally crossbedded; silty partings common in thin-bedded units. 250–285 feet thick.

€lp **LINCOLN PEAK FORMATION**—limestone and shaly limestone, medium-dark-gray, very thin bedded; contains some interbedded shale and calcareous shale; basal unit is interbedded limestone and pale-red purple shale. Complete section not exposed in map area; estimated thickness 4,000–4,500 feet.

€pc **POLE CANYON LIMESTONE**—limestone, white to dark-gray, thin-bedded to massive; members A and C are dark gray and contain discontinuous argillaceous partings; members B and D are light gray, massive, cliff forming; member E is dark-gray limestone with a medium-gray massive unit. About 1,800 feet thick.

€p **PIOCHE SHALE**—siltstone, sandy siltstone, and calcareous quartzite; upper member is calcareous quartzite, fine-grained, contains some beds and lenses of sandy limestone. Lower member, comprising lower three-fourths, is light-olive-gray to dark-greenish-gray siltstone and sandy siltstone. 7- to 18-foot limestone bed ("Wheeler Limestone") near base. 325–450 feet thick.

€pm **PROSPECT MOUNTAIN QUARTZITE**—quartzite, very light gray to red-purplish gray, fine- to coarse-grained; commonly crossbedded; most beds 6–36 inches thick; some thin interbeds of argillite. Upper 100–200 feet is transition zone composed of alternating siltstone and quartzite. Includes the Stella Lake Quartzite of Misch and Hazzard (1962) which they considered Precambrian. Estimated thickness 5,000 feet.

p€o **OSCEOLA ARGILLITE OF MISCH AND HAZZARD (1962)**—argillite, medium-gray to dark-gray; some light-gray to greenish-gray laminae; metamorphosed to hornfels and spotted hornfels. 600–750 feet thick.

p€s **SHINGLE CREEK QUARTZITE**—quartzite, light-gray to light-brownish-gray, medium- to coarse-grained, poorly sorted, locally conglomeratic; beds 6–36 inches thick. Total thickness about 500 feet; only upper part exposed in map area.

STRATIGRAPHIC SECTIONS OF SEDIMENTARY ROCKS

The Precambrian and Paleozoic rocks exposed in the Wheeler Peak and Garrison quadrangles represent a nearly complete stratigraphic sequence from late Precambrian to Permian and comprise a section more than 28,000 feet thick. The nomenclature for most of the Paleozoic formations follows the common usage in nearby ranges in western Utah and eastern Nevada. No new formation names are introduced. The Precambrian Osceola Argillite and Shingle Creek Quartzite were named by Misch and Hazzard (1962, p. 300–302) for exposures 1–2 miles north of the Wheeler Peak quadrangle. Because the name Osceola had been used earlier in other areas, however, the name Osceola Argillite has not been formally accepted for Survey usage. The type sections of the Pole Canyon Limestone, Lincoln Peak Formation, Johns Wash Limestone, and Corset Spring Shale lie within the Wheeler Peak quadrangle. Nomenclature of formations in Pogonip Group of Late Cambrian and Early and Middle Ordovician age follows that of Hintze (1951), who divided the Pogonip of eastern Nevada and western Utah into the House, Fillmore, Wahwah, and Juab Limestones and the Kanosh Shale and Lehman Formation. As mapped within the Wheeler Peak and Garrison quadrangles, the House Limestone includes some beds of latest Late Cambrian age. The Fillmore, Wahwah, and Juab Limestones are shown as a single unit on the geologic map, and these names have not been accepted for Survey usage. The contact between the Fillmore and Wahwah can be mapped where exposures permit, but the Wahwah and Juab cannot be divided on the basis of lithologic features.

Formations younger than Middle Cambrian lie in the upper plate of the Snake Range decollement and are broken by numerous faults. Complete unfaulted sections could not be found for many formations, and for several, a composite section could not be compiled from various segments. Two of the stratigraphic sections described below were measured south of the quadrangle boundaries. The locations of the measured sections are shown on the index map that accompanies the geologic map.

STRATIGRAPHIC SECTION OF UPPER PART OF THE CHAINMAN SHALE MEASURED SOUTH OF MURPHY WASH, ABOUT 1 1/4 MILES SOUTH OF THE WHEELER PEAK QUADRANGLE. (SECTION A)

	Thickness (feet)
ELY LIMESTONE (LOWER BEDS ONLY):	
Limestone, medium-gray; weathers same color; beds 1–12 inches thick; irregular chert in beds, lenses, and nodules as much as 10 inches thick; some beds of coarse-grained organic detrital limestone.	
CHAINMAN SHALE:	
9. Covered; chiefly dark-gray shale	21
8. Calcareous sandstone, light-brownish-gray, very fine grained; weathers grayish orange	8
7. Covered. Shale, dark-gray; bed of medium-dark-gray organic detrital limestone 2–3 feet above base	64
6. Sandstone, light-brownish-gray, very fine grained; basal 5 feet is calcareous and contains lenses of medium-dark-gray limestone	16
5. Covered. Shale; weathers dark yellowish brown	57
4. Calcareous siltstone, light-brown; weathers grayish orange; poorly exposed	1
3. Shale, dark-gray; weathers light olive gray; interval poorly exposed	14
2. Covered. Interbedded sandstone and shale	24
1. Sandstone, yellowish-gray, medium-grained, well-sorted; weathers yellowish gray to grayish brown; some beds cross laminated; bedding poorly defined and obscured by fractures; base not exposed	35
Partial thickness of Chainman Shale	240
ALLUVIUM	

STRATIGRAPHIC SECTION OF PART OF THE JOANA LIMESTONE MEASURED ON EAST SIDE OF JOHNS WASH. (SECTION B)

Top Of Ridge	
JOANA LIMESTONE:	
2. Limestone, medium-gray to medium-dark-gray; chiefly organic detrital, crinoidal in part; beds 2–12 inches thick; beds of chert up to 12 inches thick 30–60 feet above base	150
1. Limestone, medium-light-gray to medium-gray, organic detrital, massive; weathers medium light gray; contains irregular nodules and stringers of chert 30–50 feet above base; forms cliff; contact with Pilot Shale not exposed	118
Partial thickness of Joana Limestone	268
PILOT SHALE	

STRATIGRAPHIC SECTION OF PART OF THE PILOT SHALE AND JOANA LIMESTONE MEASURED 1 MILE NORTHEAST OF PRUESS LAKE. (SECTION C)

JOANA LIMESTONE:	
3. Limestone, medium-gray, coarsely clastic, massive; weathers light gray to medium dark gray; forms cliff; section measured to base of a cherty zone about 10 feet thick	22

	Thickness (feet)
2. Covered; chiefly nodular-bedded limestone with interbedded siltstone; beds 1/4–1 inch thick	17
1. Quartzite, very light gray, medium-grained, well-sorted; weathers grayish orange pink; poorly defined beds 3–12 inches thick	11
Partial thickness of Joana Limestone	50
PILOT SHALE:	
4. Covered	17
3. Interbedded limestone and silty limestone; 2- to 6 inch beds of medium-dark-gray limestone with scattered blebs of chert alternate with 1/2- to 2-inch beds of light-brownish-gray, light-brown- to pale-red-weathering silty limestone with scattered chert lenses	47
2. Interbedded siltstone and limestone; olive-gray siltstone as much as 1-2 feet thick alternates with medium-dark-gray limestone beds as much as 6 inches thick; unit is transitional between enclosing units; mostly covered	59
1. Calcareous siltstone, olive-gray, finely laminated, weathers yellowish gray to pale red; splits into beds 1/16–1/4 inch thick	73
Partial thickness of Pilot Shale	196
ALLUVIUM	

STRATIGRAPHIC SECTION OF THE SIMONSON DOLOMITE MEASURED WEST OF BIG SPRINGS RANCH, 3 MILES SOUTH OF THE GARRISON QUADRANGLE. (SECTION D)

	Thickness (feet)
GUILMETTE FORMATION (LOWER BEDS ONLY):	
Limestone, medium-gray; beds 1–24 inches thick; some beds near base contain silty laminae; tends to weather massive.	
SIMONSON DOLOMITE:	
4. Dolomite, alternating light and dark beds; light-colored dolomite is medium gray, aphanitic, weathers light gray; some laminated; beds 1–3 feet thick; dark-colored dolomite averages medium dark gray, aphanitic to medium grained; weathers brownish gray to olive gray; some laminated; forms faintly color banded units 1–6 feet thick; in lower half some beds contain abundant stromatoporoids and tubulars; several interbeds or lenses of limestone in upper 15 feet	111
3. Dolomite, dark-gray, fine-grained, massively bedded; weathers brownish gray to olive gray, commonly crowded with stromatoporoid heads and "spaghetti"; about 8 feet above base is dark-gray, very thin bedded aphanitic limestone as much as 15 feet thick that grades into dolomite along strike	83
2. Dolomite, alternating light and dark beds; dark dolomite predominates; light-colored beds are medium light gray to medium dark gray, aphanitic, faintly laminated; weather light gray; beds average 12 inches thick, but some as much as 5 feet; dark-colored beds are light yellowish gray to dark gray, very fine to medium grained, laminated; weather brownish gray. Unit weathers to series of steps 3–15 feet high; light-gray aphanitic dolomite commonly forms benches between the beds of dark dolomite; poorly preserved stromatoporoids in upper part; base is lowest bed of light-gray-weathering aphanitic dolomite.	228
1. Dolomite, light-brownish-gray to brownish-gray, medium- to coarse-grained, thick-bedded to massive; crude laminae, locally undulating, probably due to algae; subdued color banding becomes more pronounced in upper part; darker dolomite has fetid odor; small lenses of fine-grained dolomite in lower part	151
Thickness of Simonson Dolomite	573
SEVY DOLOMITE (UPPER PART ONLY):	
Dolomite, medium-light-gray, microcrystalline; weathers distinctive very light gray; beds and lenses of quartzite and dolomitic sandstone; beds 4–24 inches thick; blocky fracture.	

PARTIAL STRATIGRAPHIC SECTION OF THE FISH HAVEN AND LAKETOWN DOLOMITES MEASURED 1 MILE SOUTH OF THE SOUTH FORK OF CHOKECHERRY CREEK. (SECTION E).

	Thickness (feet)
Fault Contact With Sevy Dolomite.	
LAKETOWN AND FISH HAVEN DOLOMITES:	
23. Dolomite, light-gray, medium-grained; weathers light to yellowish gray; grain size variable in lower third; massive, blocky fracture; weathered surface commonly pitted.	206
22. Dolomite, medium light-gray, fine-grained; weathers mottled light gray; crinoidal debris, tetracorals, and brachiopods abundant in lower half	64
21. Dolomite, medium-gray, medium-grained; weathers medium dark brownish gray; nodular chert layers 1–4 inches thick spaced about 2–6 inches apart; chert weathers very light gray to pale yellowish brown	62
20. Dolomite, banded dark-gray and medium-light-gray, fine- to medium-grained; contains several bodies of breccia; some crinkled beds near center	54
19. Dolomite, interbedded medium-dark-gray very fine grained dolomite and brownish-black medium-grained dolomite; beds 2–18 inches thick	6
18. Dolomite, medium-gray, aphanitic; weathers light gray; closely resembles Sevy Dolomite; mostly intraformational conglomerate in lower 25–30 feet; beds 2–12 inches thick; much minor variation in attitude	44
17. Dolomite, medium-dark-gray; subtle color banding on weathered surface; beds 4–12 inches thick	4
16. Dolomite, medium-gray; weathers light gray to light brownish gray; intraformational conglomerate; basal 2 feet is crinkled.	15
15. Dolomite, medium-dark-gray; similar to unit 13; upper 3 feet laminated	7
14. Dolomite, medium-gray; weathers light brownish gray; contains abundant nonsilicified brachiopods.	13
13. Dolomite, medium-dark-gray; weathers brownish gray; slightly coarser grained and less resistant than unit below	41
12. Dolomite, medium-gray, medium-grained; weathers light brownish gray, commonly mottled; beds 2–12 inches thick; many beds contain nonsilicified tetracorals and pentameroid brachiopods	129
11. Dolomite, light-gray; weathers same color; vuggy; scattered irregular nodules of chert; chert nodules 2–5 feet below top are as much as 3 inches thick; uppermost 2 feet is clastic and contains abundant fossil debris; forms cliff	22
10. Dolomite, medium- to light-gray, fine-grained; vaguely color banded on weathered surface; beds 2–12 inches thick; interval mostly covered	11
9. Dolomite, medium-light-gray, fine-grained, massive; weathers mottled light gray; scattered nodules of chert locally replace corals.	16
8. Dolomite, light-gray; similar to unit below except faintly color banded owing to 1- to 3-foot beds of very fine grained dolomite; contains favositid corals; resistant, tends to form cliff.	58
7. Dolomite, light-gray, fine- to medium-grained; weathers light gray; crude beds 6–36 inches thick; very homogeneous; tends to form cliff	134
6. Dolomite, dark-gray; weathers brownish gray; irregular lenses and nodules of dark-gray chert; well-developed beds 2–12 inches thick	68
5. Dolomite, medium-light-gray, fine- to medium-grained; weathers same color or faintly mottled; small vugs common; crinoidal fragments in upper 30 feet; fractures obscure bedding	224
4. Dolomite, alternating layers medium-light-gray to medium-dark-gray, fine-grained; beds 4–24 inches thick; interval mostly covered.	45
3. Dolomite, medium-dark-gray, very fine grained;	

	Thickness (feet)
weathers medium light gray; nodules and lenses of chert; scattered crinoidal fragments; beds 2–12 inches thick	69
2. Dolomitic sandstone, medium-light-gray, well-sorted; beds poorly defined; some beds cross laminated; scattered crinoidal fragments; forms resistant unit	15
1. Covered; probably same as overlying unit	34
Partial thickness of Laketown and Fish Haven Dolomites	1,341

EUREKA QUARTZITE

STRATIGRAPHIC SECTION OF THE EUREKA QUARTZITE MEASURED 2 MILES SOUTH OF CHOKECHERRY CANYON. (SECTION F).

	Thickness (feet)
FISH HAVEN DOLOMITE (LOWER BEDS ONLY):	
Dolomitic sandstone, medium-light-gray; grades upward into medium-gray sandy dolomite; locally contains irregular pale-red silty partings; crude laminae show on weathered surfaces in lower part; beds 2–12 inches.	
EUREKA QUARTZITE:	
6. Sandstone, light-gray; less resistant than underlying unit	4
5. Quartzite and sandstone, very light gray, vitreous, fine- to medium-grained, well-sorted; lower third is predominantly highly indurated sandstone	365
4. Sandstone, very light gray to pinkish-gray, well-sorted; weathers light gray to pale red; well-defined beds 6–36 inches thick	25
3. Covered	26
2. Silty sandstone; weathers pale red to grayish orange; some beds slightly calcareous; beds 1/2–2 inches thick in lower half and 1–2 feet thick in upper half; forms resistant outcrop	12
1. Mostly covered. Siltstone and sandstone, medium-dark-gray to dark-brownish-gray; some beds slightly calcareous	8
Thickness of Eureka Quartzite	440
LEHMAN FORMATION (UPPER BEDS ONLY):	
Limestone, medium-dark-gray; abundant silty material weathers grayish orange; beds 1/2–2 inches thick.	

STRATIGRAPHIC SECTIONS OF THE KANOSH SHALE AND LEHMAN FORMATION MEASURED 1 1/4 MILES SOUTH OF CHOKECHERRY CANYON. (SECTION G).

	Thickness (feet)
EUREKA QUARTZITE (LOWER BEDS ONLY):	
Silty sandstone, very fine grained; weathers mottled pale red and grayish orange; beds 1/2–2 inches thick; lower half of unit covered; contact with Lehman Formation not exposed	12
LEHMAN FORMATION:	
5. Limestone, medium-dark-gray; bedding wavy; contains grayish-orange-weathering silty material; mostly covered	182
4. Interbedded sandy limestone and calcareous sandstone similar to unit 2	8
3. Covered	5
2. Interbedded sandy limestone and very fine grained calcareous sandstone; sandstone beds 1/2–2 inches thick, very uneven and somewhat discontinuous; weathers grayish orange	8
1. Limestone, medium-dark-gray; weathers to medium bluish gray; grayish-orange-weathering silty partings; beds 1/2–4 inches thick; interval mostly covered; contact with Kanosh Shale not exposed	247
Thickness of Lehman Formation	450
KANOSH SHALE:	
Mostly covered; forms soil with small flakes of yellowish-brown to olive-gray shale and fragments of coarsely bioclastic limestone	471
Thickness of Kanosh Shale	471
JUAB AND WAHWAH LIMESTONES OF HINTZE (1951), UNDIVIDED:	
Limestone, medium-dark-gray to dark-gray; abundant grayish-orange-weathering silty partings accentuate bedding; beds 2–24 inches thick.	

STRATIGRAPHIC SECTION OF THE FILLMORE, WAHWAH, AND JUAB LIMESTONES OF HINTZE (1951) MEASURED ON THE EAST SIDE OF JOHNS WASH, SOUTHWEST OF PEAK 9512. (SECTION H).

	Thickness (feet)
KANOSH SHALE:	
Shale, yellowish-brown to olive-gray; interbeds of limestone.	
JUAB AND WAHWAH LIMESTONES, UNDIVIDED:	
5. Limestone, medium-gray to medium-dark-gray, very fine grained to coarsely clastic; grayish-orange-weathering discontinuous silty partings; beds 4–24 inches thick; tends to weather massive	166
4. Covered; mostly shaly limestone and calcareous shale, grayish-orange to pale-yellowish-brown; some beds of coarsely clastic limestone and intraformational conglomerate; forms bench	29
3. Limestone and shale; units 6–36 inches thick composed of very thin bedded limestone and yellowish-gray to pale-olive shale alternate with beds 4–24 inches thick composed of aphanitic to coarsely clastic medium-light-gray to medium-dark-gray limestone with sparse to abundant knots and irregular thin partings of yellowish-orange shale	77
2. Covered	49
1. Limestone and shale, same as unit 3; contains a few beds of intraformational conglomerate	91
Thickness of Juab and Wahwah Limestones, undivided	412
FILLMORE LIMESTONE:	
2. Covered	30
1. Limestone with interbedded shale; limestone is medium gray to medium dark gray; beds 2–24 inches thick; weathered surfaces show sparse to abundant yellowish-gray to pale-yellowish-brown shaly and silty partings, lenses, and knots; some beds of intraformational conglomerate; chert in several zones; mostly covered	537
Partial thickness of Fillmore Limestone	567
ALLUVIUM	

STRATIGRAPHIC SECTION OF PART OF THE HOUSE LIMESTONE, MEASURED ON THE SOUTH SIDE OF BLACK CANYON. (SECTION I).

	Thickness (feet)
Top of ridge	
HOUSE LIMESTONE:	
9. Limestone, medium-dark-gray; silty partings common on bedding planes; beds 1–12 inches thick	30
8. Limestone, same as unit 7 but with chert lenses as much as 12 inches thick; chert in places cuts across bedding planes; more resistant than enclosing units	49
7. Limestone, medium-dark-gray; silty partings common on bedding planes; some interbeds and lenses of coarsely clastic limestone in places grading to limestone-pebble conglomerate; chert locally abundant; beds 1–12 inches thick, 2–5 feet thick in lower 15 feet; upper three-fourths mostly covered	164
6. Limestone, medium-dark-gray; thin lenses of silty material common in some beds; beds 6 inches to 6 feet thick; forms break in slope	27
5. Limestone, medium-gray to medium-dark-gray; chert abundant in some beds, but very sparse in upper part; unit tends to weather massive but locally breaks down into thinner beds where silty partings are present; forms cliff	134
4. Limestone, medium-dark-gray; lenses of chert 1–4 inches thick; upper half is 50 percent chert	4
3. Limestone, medium-dark-gray; weathers same color; some coarsely clastic beds in lower 50 feet; chert lenses and nodules common in the thicker beds; silty partings gradually decrease upward, rare in upper third; beds 4–36 inches thick; unit tends to form cliff	174
2. Limestone, medium-gray to medium-light-gray;	

	Thickness (feet)
weathers medium gray; many beds coarsely clastic and contain fragments as much as half an inch long; others contain thin yellowish-gray- to pale-red-weathering silty partings; coarsely clastic limestone predominates in lower third; beds poorly defined, chiefly 2–12 inches thick; some massive 4- to 8-foot beds in lower half contain stromatoliths; character of beds may vary along strike; in upper half some massive beds of fine-grained limestone contain lenses and nodules of chert	158
1. Limestone, medium-dark-gray; weathers medium gray; scattered thin silty lenses weather yellowish gray; beds chiefly 3–24 inches thick, but several are 5–6 feet thick; much of the limestone has a clastic texture; abundant chert nodules 45–48 feet above base; upper 6–8 feet is massive-weathering clastic limestone	58
Partial thickness of House Limestone	798

NOTCH PEAK LIMESTONE (UPPER PART ONLY):

Limestone, medium-gray to medium-dark-gray, massive; very sparse chert; dolomite common as irregular replacement of limestone.

PARTIAL SECTION OF THE NOTCH PEAK LIMESTONE, MEASURED ON WEST SIDE OF JOHNS WASH. (SECTION J).

Top of ridge

NOTCH PEAK LIMESTONE:

4. Limestone, medium-dark-gray to dark-gray, massive; mottled with wisps of yellowish-gray silt and dolomite	120
3. Limestone, medium-gray to medium-dark-gray, massive; weathers medium light gray; sparse to abundant nodules and lenses of chert as much as 2 inches thick; irregular thin partings of siliceous silt in basal part reflect gradation with unit below	1,106
2. Limestone, medium-gray to medium-dark-gray; pinkish-gray to pale-red siliceous silty partings along bedding planes and as irregular lenses; sparse chert; beds 1/2–2 inches thick	126
1. Limestone, medium-gray; very uneven grayish-orange and light-brown lenses of silt and impure chert; sparse nodules and stringers of chert; commonly nodular bedded; beds 4–24 inches thick	84
Partial thickness of Notch Peak Limestone	1,436

CORSET SPRING SHALE:

Shale, light-olive-gray; mostly covered.

STRATIGRAPHIC SECTION OF THE CORSET SPRING SHALE MEASURED ON THE EAST SIDE OF LINCOLN PEAK. (SECTION K).

NOTCH PEAK LIMESTONE

CORSET SPRING SHALE:

10. Shale, light-olive gray; scattered discoidal nodules of medium-gray aphanitic limestone 1–3 inches in diameter	13
9. Limestone, medium-gray, coarsely clastic; contains trilobite and echinodermal fragments; a few irregular silty partings in upper 3 feet; beds 2–6 inches thick; bedding planes uneven; forms massive-weathering outcrop	17
8. Shale, light-olive-gray; splits into layers 1/16–1/4 inch thick	5
7. Limestone, medium-gray; basal 1 foot is coarsely bioclastic; grades upward to very fine grained limestone with uneven, discontinuous silty partings	4
6. Shale, light-olive-gray; splits into layers 1/16–1/4 inch thick; in middle of unit is a bed or lens 2–8 inches thick of coarsely clastic limestone which along strike contains intraformational conglomerate like that in unit 5	7
5. Shale, light-olive-gray; lenses of coarsely bioclastic limestone average 1/4–1 inch thick and 3–24 inches long; 3 feet above base is a 6-inch bed of intraformational conglomerate with rounded, flat limestone pebbles in a clastic limestone matrix; top 1 foot is coarsely bioclastic limestone with basal 2 inches an intraformational conglomerate	10
4. Shale, light-olive-gray	7
3. Limestone, medium-gray, coarsely clastic; crowded with fragments of trilobites; irregular silty partings in upper 2–6 inches	1
2. Shale, light-olive-gray	3
1. Limestone, dark-gray; weathers medium light gray; bedding uneven, 1/2–2 inches thick; locally nodular due to coalescence of grayish-orange-weathering shaly partings; basal 6 inches is light-olive-gray shale	3
Thickness of Corset Spring Shale	70

JOHNS WASH LIMESTONE

STRATIGRAPHIC SECTION OF THE JOHNS WASH LIMESTONE MEASURED ON THE WEST SIDE OF JOHNS WASH. (SECTION L).

CORSET SPRING SHALE

JOHNS WASH LIMESTONE:

11. Limestone, medium-gray; abundant discontinuous silty partings; beds chiefly 2–12 inches thick, some 3–4 feet; 8-inch bed of intraformational conglomerate 1 foot below top	22
10. Limestone, medium-light-gray to medium gray; mottled with calcite blebs; weathers massive but in some parts silty partings develop beds 3–18 inches thick	130
9. Limestone, medium-gray; very abundant yellowish-orange-weathering silty partings	5
8. Limestone, medium-light-gray; mottled with calcite blebs; contains thin seams of silty material spaced about 1–3 inches apart; weathers massive	12
7. 50 percent covered. Limestone, medium-dark-gray; irregular silty partings; beds mostly 2–6 inches thick	26
6. Limestone, medium-gray; mottled with blebs of calcite and silty material; beds 2–6 inches thick; several interbeds of shaly limestone; 1-foot bed of intraformational conglomerate at top	5
5. Limestone, medium-dark-gray; weathers medium light gray; beds 1/2–2 inches thick; 1/4- to 3/4-inch interbeds of yellowish-orange-weathering silty limestone	10
4. Limestone, medium-dark-gray; mottled on weathered surface; composed chiefly of medium-sand-sized clasts of dolomite and calcite; upper two-thirds strongly cross laminated; beds 3–6 inches thick, but unit tends to weather massive	30
3. Limestone, medium-gray; weathers medium light gray; wavy grayish-orange-weathering silty partings make up 15–25 percent of rock; partings more abundant and more continuous in upper half	15
2. Limestone, medium-gray to medium-dark-gray; most beds coarsely clastic, rounded clasts average less than 1 mm in diameter but locally are as large as 4 mm; many clasts are dolomite; cross-stratification pronounced in some beds; beds average 2–6 inches thick, but locally weather massive; some beds lenticular	20
1. Limestone, medium-dark-gray; weathers medium gray; beds 1/2–2 inches thick; a few thin silty partings; base not exposed	8
Thickness of Johns Wash Limestone	283

LINCOLN PEAK FORMATION

STRATIGRAPHIC SECTION OF THE POLE CANYON LIMESTONE. E MEMBER MEASURED ON THE SOUTH SIDE OF SWALLOW CANYON (SECTION M); D AND B MEMBERS MEASURED EAST OF THE FORK IN LINCOLN CANYON (SECTION N); C MEMBER MEASURED ON THE NORTH SIDE OF SWALLOW CANYON (SECTION O); A MEMBER MEASURED NEAR THE HEAD OF THE NORTH FORK OF BIG WASH (SECTION P).

LINCOLN PEAK FORMATION (LOWER BEDS ONLY):

Interbedded dark-gray limestone and pale-red-purple shale.

POLE CANYON LIMESTONE:

E member:

	Thickness (feet)
5. Limestone, dark-gray; weathers medium dark gray; beds 1–6 inches thick; poorly exposed; forms bench	93
4. Limestone, medium-gray to medium-light-gray; weathers medium gray to light gray, becomes slightly darker in upper part; massive; some oolitic limestone in lower part; upper 5 feet contains some silty partings and locally breaks down into beds 1–3 inches thick	138
3. Limestone, medium-gray to medium-dark-gray; weathers medium light gray to light gray; tends to weather massive, but in places breaks down into beds 1–3 inches thick; along strike is mostly covered by talus from unit above	51
2. Covered; basal part contains some clastic limestone with oolites and *Girvanella*-like forms	51
1. Limestone, medium-dark-gray; weathers medium gray; beds 1–3 inches thick; moderate-orange-pink- to pale-red-weathering silty material as partings or filling depressions on irregular bedding surfaces; forms top part of cliff	24
Thickness of E member	357
D member:	
5. Limestone, light- to medium-gray, massive, upper part clastic, oolites locally abundant	46
4. Limestone, medium- to dark-gray; mottled with irregular silty partings	4
3. Limestone, light- to medium-gray, massive, forms cliff	32
2. Limestone, medium-gray to medium-dark-gray; contains numerous silty partings; uneven bedding 2–6 inches thick; *Girvanella*(?) in several thin zones	41
1. Limestone, light-gray to medium-light-gray; scattered calcite blebs are alined roughly parallel to bedding; massive; weathers to rough surface	71
Thickness of D member	194
C member:	
4. Limestone similar to unit 2; most of unit poorly exposed	46
3. Limestone, medium-gray; abundant discontinuous shaly films; more massive than unit below	28
2. Limestone, dark-gray; pale-red shaly partings on bedding planes and along stylolitic seams; sparse pinkish-gray partings of very fine grained dolomite; weathers massive, but along strike breaks down into beds 1–12 inches thick	86
1. Limestone, medium-gray; some beds clastic and contain oolites and *Girvanella*(?); abundant thin pale-red shaly partings; scattered pinkish-gray partings and lenses of very fine grained dolomite; weathers massive, but locally breaks down along strike into beds 1–4 inches thick	10
Thickness of C member	170
B member:	
Limestone, medium-light-gray to very light gray, aphanitic; contains blebs of coarse-grained calcite and sparse irregular blebs of light-brown dolomite; massive; a few zones contain 1/2- to 2-inch layers of fine-grained medium-dark-gray dolomite; commonly weathers to rough pitted surface; forms cliff	656
Thickness of B member	656
A member:	
7. Silty limestone, medium-dark-gray, very thin bedded, faintly laminated on weathered surface; thin interbeds of light-olive-gray-weathering siltstone	5
6. Limestone, dark-gray; beds 1–6 inches thick; partings along bedding planes are commonly dolomitic; scattered *Girvanella*(?); weathers to very resistant unit with small ledges	90
5. Calcareous quartzite, pale-yellowish-brown, very fine grained; thin lenses of limestone become more abundant near top	11
4. Limestone, dark-gray, massive-weathering; sparse silty partings better developed in upper 35–50 feet; *Girvanella*(?) abundant except in upper 35–50 feet; forms steep slope	185
3. Shale and siltstone, dark-gray, thinly laminated; upper 2–3 feet is very fine grained pale-yellowish-brown calcareous quartzite	11
2. Limestone, dark-gray, thin-bedded, commonly crossbedded; contains scattered quartz grains; silty partings and interbeds as much as 2 inches thick; forms small bench	11
1. Limestone, dark-gray, commonly sandy; poorly developed bedding accentuated by yellowish-gray-weathering silty or dolomitic partings as much as half an inch thick; oolites rare; crossbedding shows faintly on some weathered surfaces; *Girvanella*(?) locally abundant; forms steep resistant slope	136
Thickness of A member	449
Total thickness of Pole Canyon Limestone	1,826
PIOCHE SHALE (UPPER BEDS ONLY):	
Interbedded quartzite and sandy limestone.	

STRATIGRAPHIC SECTION OF THE PIOCHE SHALE. UPPER MEMBER MEASURED NEAR THE HEAD OF THE NORTH FORK OF BIG WASH (SECTION P); LOWER MEMBER MEASURED ON THE NORTH SIDE OF POLE CANYON, 2,000 FEET NORTH OF THE MOUNT WHEELER MINE. (SECTION Q).

	Thickness (feet)
POLE CANYON LIMESTONE:	
PIOCHE SHALE:	
Upper member:	
6. Interbedded calcareous quartzite and sandy limestone; quartzite is light gray to yellowish brown, fine grained, thin bedded, contains lenses of sandy limestone; limestone is medium dark gray and contains lenses of quartzite	20
5. Limestone, medium-dark-gray, locally cross laminated; contains sandy lenses as much as 2 inches thick	13
4. Same as unit 6	36
3. Calcareous quartzite, light-brownish-gray, very fine grained, thin-bedded; some shaly interbeds as much as half an inch thick	23
2. Calcareous quartzite, light-gray to yellowish-brown, fine-grained, thin-bedded; some thin beds and lenses of sandy limestone; limestone is commonly cross laminated and contains some grains of detrital dolomite	10
1. Interbedded quartzite and siltstone; quartzite is light gray, very fine grained, commonly faintly laminated; some beds calcareous; siltstone is identical to that in lower member, but grades upward into light-olive-gray thin-bedded impure quartzite; base of member is 1-foot bed of calcareous quartzite	12
Thickness of upper member	114
Lower member:	
13. Siltstone, brownish-gray; beds 1/8–1 inch thick; upper 10 feet contains interbeds 1–3 inches thick of quartzite and calcareous quartzite; number of interbeds increases upwards	15
12. Siltstone and shale, dark-greenish-gray, micaceous; beds 1/32–1 inch thick; weathers olive gray	24
11. Covered	51

	Thickness (feet)
10. Siltstone and shale, dark-greenish-gray to light-olive-gray, micaceous; beds 1/16–1 inch thick; weathers dark greenish gray to olive gray; interval partly covered	63
9. Covered	40
8. Siltstone, greenish-gray to light-olive-gray, micaceous; beds 1/4–1 inch thick	7
7. Covered	12
6. Sandy siltstone, greenish-gray to light-olive-gray, micaceous; some beds of very fine grained sandstone; weathers light olive gray	8
5. Covered; probably same as unit 6	36
4. Wheeler Limestone: Limestone, medium-gray to dark-bluish-gray, clastic; discontinuous pale-reddish-brown silty partings on uneven bedding surfaces; beds 2–12 inches thick	18
3. Covered; probably same as unit 2	52
2. Siltstone and sandy siltstone, yellowish-brown to light-olive-gray, micaceous; splits into flaggy layers 1/16–2 inches thick; weathers moderate brown to pale yellowish brown	9
1. Sandy siltstone and very fine grained quartzite, yellowish-brown to light-olive-gray, micaceous; beds 1/2–24 inches thick; bedding planes are irregular and commonly show fucoidal markings; weathers pale reddish brown to yellowish brown	6
Thickness of lower member	341
Total thickness of Pioche Shale	455

PROSPECT MOUNTAIN QUARTZITE (TRANSITION ZONE)

STRATIGRAPHIC SECTION OF UPPER PART OF THE PROSPECT MOUNTAIN QUARTZITE MEASURED ON THE NORTH SIDE OF POLE CANYON, 2,000 FEET NORTH OF THE MOUNT WHEELER MINE (SECTION Q).

	Thickness (feet)
PIOCHE SHALE (LOWER BEDS ONLY):	
Sandy siltstone and very fine grained quartzite, yellowish-brown to light-olive-gray	
PROSPECT MOUNTAIN QUARTZITE:	
9. Quartzite, very light gray, medium-grained; beds 4 inches to 5 feet thick; thin siltstone unit 2–3 feet below top forms narrow bench; cliff-former	13
8. Siltstone, light-olive-gray to dark-greenish-gray, micaceous; beds 1/8–3/4 inch thick	6
7. Quartzite, very light gray, medium-grained; beds 4–24 inches thick; basal 3–4 feet is interbedded quartzite and shale in beds 1–6 inches thick; cliff-former	19
6. Siltstone, same as unit 8; mostly covered	30
5. Quartzite, very light gray to yellowish-gray, medium-grained; beds 4–36 inches thick; lower part slightly micaceous and thinner bedded; thin argillaceous unit 7 feet below top forms small bench; cliff-former	23
4. Covered; probably same as unit 3, but may contain some beds of quartzite typical of unit 5	40
3. Quartzite and shaly quartzite, yellowish-gray to pale-brown, very fine grained; beds 1/4–1 inch thick; bedding planes uneven and covered with thin layer of micaceous siltstone that resembles typical Pioche Shale; organic markings common	11
2. Covered; probably same as unit 3	15
Thickness of transition zone	157
1. Quartzite, very light gray to yellowish-gray, locally stained pale-yellowish-brown to moderate-brown; medium- to coarse-grained; some beds poorly sorted, with rounded quartz granules as much as a quarter of an inch across; beds 2 inches to 6 feet thick; some beds cross laminated; thin interbeds of very fine grained shaly or micaceous quartzite; organic markings common in upper part; unit contains several cliffs as much as 30 feet high	149
Partial thickness of Prospect Mountain Quartzite	306
ALLUVIUM	

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