

GeothermEx, Inc.

SUITE 201
5221 CENTRAL AVENUE
RICHMOND, CALIFORNIA 94804

(415) 527-9876

CABLE ADDRESS: GEOTHERMEX
TELEX: 709152 STEAM UD
FAX: (415) 527-8164

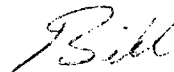
January 20, 1986

Mr. Anthony J. Adduci
DOE-SAN
1333 Broadway
Oakland, CA 94612

Dear Tony:

As explained to Charlie Harper, these descriptions have not been edited and are considered preliminary. They may, however, be distributed for immediate use by participants in the deep hole project, with the caveat that these will be edited and possibly modified before being considered final.

Best regards,



William F. Isherwood
Senior Geophysicist

WFI/m

enclosure

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147 SS-A1 (1/8/86)h

APPENDIX A

STATE 2-14

SAMPLE DESCRIPTIONS

Depth (feet)	Description
180	Clay, light-medium gray and tan. Trace of very fine-grained, colorless, detrital mica; moderately calcareous.
210	Clay, as above. Trace of detrital mica, as above. Trace of carbonaceous material. Moderately calcareous.
240	80% Clay, as above, with minor yellow limonite-stained clay spots; moderately calcareous. 20% Sand, poorly-sorted, coarse to very coarse and pebble-size, subrounded to rounded; may be in clay material. Clasts are light green altered volcanic rock, medium brown tuff(?), white chalcedony. All appear to be from a volcanic source. Trace of microscopic gastropods and carbonaceous material.
270	90% Clay, as above, no limonite spots. Moderately calcareous. Trace of carbonaceous material. 10% Sand, poorly sorted, fine to granule sizes, mainly subrounded. Clasts are medium brown tuff(?), pink altered volcanic rock, quartz, and fine mica.
300	Clay, as above. Calcareous. Trace of fine detrital colorless mica.

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147 SS-A2 (1/8/86)h

Depth (feet)	Description
330	Clay, as above. Calcareous, sandy and pebbly. Clasts % uncertain. Pebbles subrounded fine-grained, red, grey and green volcanic clasts. Large fragments of hard calcareous fine-grained well-sorted sandstone present, either as clasts or thin cemented layers. Sand grains are fine, well-sorted, subangular, mainly quartz.
360	Clay, as above, light to medium gray with minor yellowish olive green, slightly indurated clay. Calcareous. Trace of carbonaceous material. Slightly sandy. Sand % uncertain but perhaps 10%. Sand grains moderately sorted, subangular. Clasts mainly quartz with trace of mica and colored rock fragments.
390	Clay, as above. Calcareous, sandy and pebbly. Clast % uncertain. Pebbles subrounded fine-grained red, gray and green volcanic clasts. Large fragments of hard calcareous fine-grained well-sorted sandstone present, either as clasts or thin cemented layers. Sand grains are fine, well-sorted, subangular, mainly quartz.
420	Clay, as above. Calcareous, sandy and pebbly. Clast % uncertain but probably low. Clasts, as above, except very fine grained.
450	Clay, as above. Calcareous, sandy. Clast % uncertain. Clasts fine to very fine grained, moderate- to well-sorted, subangular; mostly quartz, trace of light-colored mica and carbonaceous material.
480	Clay, as above. Calcareous, sandy and pebbly. Clasts mainly fine to very fine grained quartz with trace of light colored mica and carbonaceous material.

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147 SS-A3 (1/8/86)h

Depth (feet)	Description
510	Clay, as above. Calcareous, sandy. Thin hard calcareous sandstone layers occur; grains are very fine to fine grained, subrounded, moderately sorted.
540	Clay, as above. Moderately calcareous. May have lower sand and pebble content than above.
570	Clay, as above. Moderately calcareous. Less sandy than above.
600	Clay, as above. Moderately calcareous. Contains thin interbed of sandstone, light gray, very fine grained, slightly indurated.
630	Clay, as above. Moderately calcareous. Trace of sand, fine to very fine grained, as above.
660	Clay, as above. Moderately calcareous. Minor sand, as above.
690	Clay, as above. Moderately calcareous. Trace of sand, as above.
720	Clay, as above. Moderately calcareous. Contains thin interbeds of weakly indurated sand, light gray, very fine grained, moderately well-sorted, as above, but softer than at 600 feet.
750	Clay, as above. Moderately calcareous. Contains thin sandstone interbeds, weakly indurated, as at 600 feet.
780	Clay, as above. Moderately calcareous. Contains thin hard calcareous sandstone layers, as above.
810	Clay, as above. Moderately calcareous. Contains thin, weakly-cemented sandstone layers, as above, probably less than 10% of unit.

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147 SS-A4 (1/8/86)h

Depth (feet)	Description
840	Clay, as above. Moderately calcareous. Contains thin beds of hard, calcareous sandstone, light gray, very fine-grained.
860	Clay, as above. Moderately calcareous. Contains thin beds of sandstone, moderately well-cemented, but similar to above.
870	Clay, as above. Moderately calcareous. Contains thin beds of hard, calcareous, very fine-grained sandstone, as above.
890	Clay, as above, but more silty or sandy. Moderately calcareous. Contains thin interbeds of very fine silty sandstone, similar to above.
900	Clay, as above. Moderately calcareous. Contains thin beds of sandstone, weakly indurated, as at 810 feet, and softer than 870 feet.
930	Clay, as above. Moderately calcareous. Contains thin beds of sandstone, weakly-indurated, as above. Percent sandstone uncertain.
1000	Clay, silty and sandy, as above, light to medium gray. Slightly calcareous. Percent sand and silt uncertain. Material is weakly-indurated.
1000-1010	Clay, medium grey and tan, sandy and silty, calcareous. Minor thin beds of sand, light gray, very fine-grained, well-sorted, partly cemented by calcite to form hard sandstone.
1010-1020	Clay, as above, sandy and calcareous. Minor thin calcareous sandstone, as above.

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147 SS-A5 (1/8/86)h

Depth (feet)	Description
1020-1030	Clay, as above, sandy and silty, calcareous. Minor thin calcareous sandstone, as above.
1060	Sandstone, light gray, very fine-grained, silty and weakly-indurated, non-calcareous. Subordinate clay, medium gray, sandy. Trace of carbonaceous material.
1090	Clay, light gray, calcareous with sand/sandstone, weakly-indurated, very fine-grained, silty, non-calcareous.
1120	Sand, light gray, very fine-grained, silty, clayey, calcareous. Trace of weak induration; with clay, light gray, as above. Trace of calcareous material.
1150	Sand/sandstone, weakly-indurated sandstone, light gray, calcareous; with clay, light gray, silty, sandy, calcareous.
1210	Clay, light gray, sandy, silty, calcareous, with about equal sand/sandstone, weakly-indurated, very fine-grained, silty, calcareous, and sandstone, medium to coarse-grained, hard. Trace of interstitial pyrite.
1240	Sand/sandstone, light gray, weakly-indurated, with a few hard, well-cemented fragments. Grain size varies from fine to very fine, silty. Calcareous, trace of interstitial pyrite; with about equal amounts of clay, light gray, weakly-indurated, calcareous, silty.
1270	Clay/claystone, light gray, weakly-indurated, silty, calcareous. Trace of carbonaceous laminae; with nearly equal sand/sandstone, weakly-indurated to locally hard and well-cemented, fine to very fine-grained, calcareous.

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147 SS-A6 (1/8/86)h

Depth (feet)	Description
1300	Claystone, light gray, silty, weakly-indurated, calcareous with subordinate sandstone, light gray, very fine-grained, soft to hard, calcareous, with trace of pyrite. Trace of carbonaceous material on partings.
1330	Sandstone, light gray, fine-grained, calcareous, hard and soft, trace of interstitial pyrite; trace of carbonaceous material; with claystone, light gray, weakly-indurated, calcareous, silty.
1360	Sandstone, as above, trace of interstitial pyrite; with claystone, silty, as above.
1390	Sandstone, light gray, fine to very fine-grained, hard, calcareous. With about equal amounts of claystone, light gray, silty, calcareous, weakly-indurated.
1420	Sandstone, as above, but varying from soft to hard. About equal amount of claystone, light gray, silty, calcareous, weakly to moderately indurated.
1450	Sandstone, as above, with about equal amounts of claystone, weakly-indurated, with disseminated very small pyrite crystals.
1480	Sandstone, light gray, fine-grained, subangular, fair sorting, calcareous cement, hard. Trace of black brittle grains (lignite?) and trace of disseminated pyrite.
1510	Sandstone, light gray, fine to very fine-grained, subangular, fair sorting, calcareous cement, hard. Trace of black grains (lignite?) in laminae.
1540	Sandstone, light gray, very fine-grained, calcareous, as above; with minor claystone, light gray, calcareous, silty, soft.

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147 SS-A7 (1/8/86)h

Depth (feet)	Description
1570	Claystone, silty, medium gray, calcareous, poorly indurated; with minor sandstone, fine to very fine-grained, calcareous, moderately hard, probably in thin beds. Trace of vitreous carbonaceous material. Traces of very fine-grained pyrite crystals.
1600	Claystone, silty, medium to light gray, calcareous. Trace of very fine disseminated pyrite crystals with minor sandstone, probably in thin beds, as above. Clay has trace of relatively large pyrite crystals and trace of black carbonaceous material; with minor sandstone, light gray, fine to very fine-grained, calcareous, moderately hard.
1630	Claystone, medium to light gray, as above, with minor sandstone, hard, as above. Trace of large pyrite crystals and carbonaceous material.
1660	Sandstone, light gray, very fine-grained, variable induration; with claystone, light to medium gray, calcareous, silty. Trace of moderately large pyrite crystals.
1690	Sandstone, light gray, very fine-grained, silty, moderately hard, calcareous, increasing pyrite crystals, increasingly large. Trace of carbonaceous material. Subordinate amount of claystone, silty, light to medium gray, calcareous.
1720	Sandstone, as above, with large pyrite crystals. Trace of black, nitreous, carbonaceous material. Subordinate amount of claystone, silty, as above.
1750	Siltstone/claystone, light to medium gray, sandy, clayey, calcareous. Trace of white, granular, soft anhydrite(?). Trace of carbonaceous fragments. Trace of pyrite.

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147 SS-A8 (1/8/86)h

Depth (feet)	Description
1780	Claystone, silty, medium gray, sandy. Calcareous. Trace of white granular, soft, crystalline material in small (2mm \pm) nodules (anhydrite?).
1810	Claystone, as above, silty and trace of sand, calcareous. Trace of white, soft, granular mineral in small nodules (anhydrite?).
1840	Claystone, as above, calcareous. Trace of granular crystalline anhydrite. Trace of disseminated pyrite crystals; with minor sandstone, fine to medium-grained, pyritic and anhydritic.
1870	Claystone, as above. Trace of anhydrite(?), as above. Trace of pyrite. Minor sandstone, very fine-grained, hard.
1900	Sample washed more than above. Large chips may be slough. Claystone, light greenish-gray, calcareous with subordinate sandstone, very fine-grained, hard, anhydrite(?). Trace of massive granular crystalline mineral (anhydrite?). Trace of large pyrite crystals.
1930	Sample, as above; large chips, may be slough. Sandstone, light gray, very fine-grained, hard, calcareous, anhydritic(?). Subordinate claystone, light greenish-gray, as above.
1960	Sample washed on finer screen. Two chip sizes. Larger may be slough. Claystone, light green-gray and gray, calcareous, moderate induration. Trace of disseminated pyrite. Minor sandstone, light-gray, very fine-grained, pyritic, anhydritic(?). Trace of anhydrite, white, granular, crystalline. Trace of black carbonaceous material.

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147 SS-A9 (1/8/86)h

Depth (feet)	Description
1980	Sample washed as above (small cuttings). Sandstone/siltstone, light gray to greenish gray, argillaceous, hard. Laminations of pyrite along bedding plane and in streaks; anhydritic(?). Subordinate claystone, light greenish-gray, silty. Trace of large lignite fragments. Trace of white granular anhydrite lumps.
2010	80% Claystone, light to medium greenish-gray, calcareous, trace of disseminated fine pyrite. 20% Sandstone, light gray, very fine-grained, hard, slightly calcareous to possibly anhydritic or quartzitic. Trace of white, compact, granular anhydrite.
2040	80% Claystone, as above. 20% Sandstone, as above. Trace of hairline calcite vein with minor galena (silver-gray).
2060	80% Claystone, as above. 20% Sandstone, as above, or siltstone. Trace of disseminated pyrite or lumpy aggregate of pyrite. Trace of sphalerite.
2080	60% Claystone, as above. 40% Sandstone, light gray, very fine-grained. Cement? Trace of anhydrite(?). Trace of sphalerite.
2100	60% Claystone, as above. 40% Siltstone, light to medium gray, hard, argillaceous. Trace of pyrite. Trace of sphalerite.
2120	60% Sandstone, light gray, very fine-grained, hard. Cement? Trace of pyrite crystal aggregates in matrix. 40% Claystone, as above. Trace of anhydrite. Trace of sphalerite.

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147 SS-A10 (1/8/86)h

Depth (feet)	Description
2140	80% Claystone, as above. 20% Sandstone, as above, hard, calcareous. Trace of pyrite in interstices.
2160	80% Claystone, as above. Trace of pyrite crystals. 20% Sandstone, as above. Trace of pyrite in interstices. Trace of galena and sphalerite.
2180	Claystone, light to medium greenish-gray, moderately indurated, calcareous. Altered very small white crystals or aggregates (identity?), give claystone a speckled appearance. Trace of hairline calcite veinlets. Trace of disseminated pyrite. Trace of open calcite crystal-lined vein.
2200	90% Claystone, as above, with disseminated white crystals and trace of pyrite. 10% Sandstone, light gray, very fine-grained, trace of pyrite. Trace of galena.
2220	90% Claystone, as above, with disseminated white crystals and trace of pyrite. 10% Sandstone, as above.
2240	80% Sandstone, light gray, fine to very fine- grained, hard, calcareous. Trace of interstitial pyrite. 20% Claystone, as above.
2260	50% Sandstone, as above. Local aggregates of interstitial pyrite. 50% Claystone, spotted, as above.
2280	50% Sandstone, as above, with trace of pyrite. Trace of black grains, carbonaceous. 50% Claystone, as above, spotted. Trace of disseminated pyrite.

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147 SS-A11 (1/8/86)h

Depth (feet)	Description
2300	60% Claystone, as above. Spotted. Common disseminated pyrite (more abundant than usual). 40% Sandstone, as above. Trace of interstitial pyrite.
2320	80% Claystone, spotted, as above; pyritic (less than at 2300). 20% Sandstone, as above.
2340	40% Claystone, light green-gray, speckled with white mineral, calcareous. Trace of fine disseminated pyrite. 40% Claystone, medium gray, spotted, as above. Trace of disseminated pyrite. 20% Sandstone, as above. Trace of pyrite in laminae. Trace of white, granular anhydrite (caving?)
2360	60% Claystone, light greenish-gray, as above. Spotted with white. Trace of fine disseminated pyrite. 20% Claystone, gray, as above. 20% Sandstone, as above. Trace (1 fragment) sphalerite.
2380	60% Sandstone, light gray, fine to very fine-grained, calcareous, hard. Trace of interstitial pyrite and red hematite. 20% Claystone, light green-gray, as above. 20% Claystone, gray, as above. Occasional vein-like masses of pyrite.
2400	50% Sandstone, as above. Trace of interstitial pyrite. Trace of interstitial galena and sphalerite. 50% Claystone, light greenish gray, calcareous, occasional white crystalline spots. Trace of disseminated pyrite. Trace of black opaque mineral, interstitial in sandstone.

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147 SS-A12 (1/8/86)h

Depth (feet)	Description
2420	50% Sandstone, as above, very fine-grained. 50% Claystone, silty, light to medium-gray and greenish-gray. Trace of disseminated pyrite and pyritic streaks.
2440	70% Claystone, light to medium gray and greenish-gray, with scattered pyrite. 30% Sandstone, as above. Trace of very hard, conchoidal fracturing; silicified sandstone. Trace of anhydrite in lumps.
2460	60% Sandstone, as above, with trace of interstitial pyrite and trace of black sulfide, rimming pyrite. Minor detrital muscovite. 40% Claystone, light gray, calcareous. Trace of pyrite. Trace of sphalerite.
2480	70% Claystone, as above; trace of pyrite aggregate. 30% Sandstone, as above; trace of interstitial pyrite. Trace of sphalerite and galena.
2500	80% Claystone and silty claystone, as above. Trace of pyrite. 20% Sandstone, as above; trace of pyrite. Minor detrital muscovite.
2520	80% Claystone and silty claystone; trace of disseminated pyrite, as above. 20% Sandstone, light gray, very fine-grained, calcareous, as above. Trace of interstitial pyrite. Minor detrital muscovite. Trace of anhydrite, probably caving.

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147 SS-A13 (1/8/86)h

Depth (feet)	Description
2540	70% Claystone and silty claystone, light greenish-gray and gray, calcareous; slight increase in pyrite; spotted with unidentified white authigenic mineral (anhydrite?). 30% Sandstone, light gray, very fine-grained. Trace of interstitial pyrite. Trace of granular, white, crystalline anhydrite.
2560	40% Claystone, light green-gray, calcareous, spotted. Trace of pyrite. Trace of anhydrite(?). 40% Siltstone, light gray, hard, calcareous, pyritic. 20% Sandstone, light gray, very fine-grained, calcareous, pyritic. Trace of anhydrite in granular fragments.
2580	50% Siltstone, as above. Trace of disseminated pyrite. 30% Sandstone, as above. Trace of interstitial pyrite. 20% Claystone, as above.
2600	50% Siltstone, as above, possibly cemented with anhydrite, glassy, crystalline. Trace of disseminated pyrite. 40% Sandstone, very fine-grained, silty. Possible anhydrite veinlets and cement. Trace of interstitial pyrite and pyrite laminae. 10% Claystone, as above.
2620	80% Siltstone, as above. Anhydritic(?). Trace of disseminated pyrite. Trace of calcite vein material. 20% Sandstone, as above, anhydritic(?).

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147 SS-A14 (1/8/86)h

Depth (feet)	Description
2640	80% Siltstone, light green-gray, calcareous, hard; trace of pyrite in laminae; veinlets or laminae of clear calcite(?). 20% Sandstone, light gray, very fine-grained; trace of disseminated pyrite.
2670	80% Siltstone, as above. More abundant pyrite, disseminated and in laminae. Hairline clear anhydrite or calcite veinlets (colorless, glassy). 20% Sandstone, as above.
2700	80% Siltstone, as above, calcareous. Trace of clear, glassy anhydrite laminae or veinlets; trace of pyrite. Trace of sphalerite in laminae(?). 20% Sandstone, as above. Trace of pyrite. Large glassy blobs of anhydrite(?). Trace of sphalerite with black metallic mineral.
2730	80% Siltstone, as above. 10% Claystone, light green-gray, silty, calcareous. 10% Sandstone, as above; patches of anhydrite(?). Trace of sphalerite.
2760	40% Siltstone, light green, calcareous, hairline veinlets of anhydrite, glassy, patches. Pyritic. 40% Siltstone, light gray, with glassy anhydrite (skeletal crystals?). Pyritic. 20% Sandstone, as above. Pyritic. Trace of sphalerite. Fragments of calcite, glassy. Trace of yellow-green glassy mineral (epidote?) in veinlets, associated with calcite, as very small prismatic crystals.

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147 SS-A15 (1/8/86)h

Depth (feet)	Description
2790	30% Siltstone, light green, as above; trace of epidote on fracture. 30% Siltstone, light gray, as above. Pyritic. 20% Sandstone, light green, very fine-grained, calcareous; trace of epidote in cement; slightly friable. Pyritic. 20% Sandstone, light gray, very fine-grained, pyritic; possible blobs of anhydrite. Trace of calcite vein.
2810	60% Siltstone, light green, as above. Trace of disseminated pyrite. 40% Siltstone, light gray, as above.
2820	60% Siltstone, light gray, as above. Trace of disseminated pyrite. 40% Siltstone, light green, as above. Trace of disseminated pyrite. Trace of epidote.
2830	70% Siltstone, light gray, as above; white spotted. Trace of disseminated pyrite. 30% Siltstone, light green, as above. Trace of sandstone, light green, very fine-grained, pyritic.
2860	50% Siltstone, light gray, spotted, as above. Trace of disseminated pyrite. 40% Siltstone, light green, as above. Trace of epidote in fracture. 10% Sandstone, light green, very fine-grained, pyritic. Slightly friable.
2890	50% Sandstone, light green, very fine-grained, calcareous, slightly friable, pyritic. Trace of chlorite (chloritized detrital mica?). 30% Siltstone, light gray, as above, spotted. 20% Siltstone, light green, as above. Trace of sphalerite.

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147 SS-A16 (1/9/86)h

Depth (feet)	Description
2920	60% Siltstone, light to medium green, spotted with white authigenic mineral, calcareous, argillaceous; trace of disseminated pyrite. 20% Siltstone, light gray, as above. Trace of epidote on fracture. 20% Sandstone, light green, as above. Trace of disseminated pyrite. Possible glassy anhydrite crystals in matrix. Trace of epidote in cement.
2950	50% Siltstone, light green, white spotted, argillaceous, calcareous, as above. Trace of pyrite-epidote-calcite vein. 30% Siltstone, light gray, spotted, pyritic. 20% Sandstone, light gray and green, fine to very fine-grained; trace of epidote in cement; trace of disseminated pyrite.
2970	50% Siltstone, gray, spotted, argillaceous, calcareous, as above; trace of disseminated pyrite. 30% Siltstone, light green, as above. 20% Sandstone, very fine-grained, as above, slightly friable. Trace of disseminated pyrite. Trace of large chlorite flakes (chloritized detrital mica?).
3040	Siltstone, light green, argillaceous, spotted with small white authigenic mineral. Less calcareous than above, hard; trace of disseminated pyrite. Sandstone, light green and light gray, very fine to fine-grained, hard and some friable, very little calcareous cement; trace of pyrite, chlorite and epidote in interstices. Trace of black, shiny mineral (specular hematite?) in very fine grains in sandstone. Trace vein calcite and chalcopyrite. Trace of claystone, light to medium gray.

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147 SS-A17 (1/9/86)h

Depth (feet)	Description
3060	40% Siltstone, light green, as above, very slightly calcareous. 40% Sandstone, fine to very fine-grained, slightly calcareous to non-calcareous, chloritic, trace of epidote, pyrite and black (hematite?) mineral. 20% Siltstone, light gray, slightly calcareous. Trace of vein calcite.
3070	60% Siltstone, light green, as above, spotted, hard. 30% Siltstone, light gray, argillaceous, calcareous, spotted (may be caving). 10% Sandstone, as above, chloritic, trace of epidote, hard, non-calcareous.
3100	90% Siltstone, medium green, hard, non-calcareous. 10% Sandstone, light green, very fine-grained, hard non-calcareous; trace of disseminated pyrite. Trace of calcite and epidote vein material. Cavings of claystone, medium gray, calcareous, and dark metal.
3107-3167	Core #6 - see core description. (REC. 54.7 feet)
3180	50% Sandstone, light green to light gray, fine and very fine-grained, some slightly calcareous and some slightly friable. Trace of interstitial pyrite and black soft carbonaceous fragments. Trace of epidote in interstices. 30% Siltstone, light green, slightly calcareous, hard, spotted with white authigenic mineral; trace of strata-bound pyrite laminae. 20% Siltstone or claystone, medium to light gray, slightly calcareous, spotted with white authigenic mineral. Several components in this sample may be cavings.

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147 SS-A18 (1/9/86)h

Depth (feet)	Description
3200	50% Siltstone, light green, spotted, as above. 30% Sandstone, as above, chloritic. 20% Siltstone or claystone, medium gray, spotted, as above, laminated. Trace of stratiform pyrite aggregates. Trace of sphalirite and chalcocite(?) in vein fragment.
3220	50% Siltstone or claystone, medium gray, spotted, as above, slightly calcareous (caving?). 30% Siltstone, light green, spotted, as above. 20% Sandstone, light green, slightly chloritic. Trace of carbonaceous(?) mineral on partings. Trace of disseminated pyrite and stratiform pyrite. Slightly calcareous.
3240	Claystone or siltstone, medium gray, spotted; trace of pyrite on laminae; calcareous. With trace of green siltstone, as above, and sandstone, as above. Amount of caving uncertain.
3260	60% Claystone, medium gray, spotted with white, moderately hard, calcareous to non-calcareous; trace of stratiform pyrite. 20% Siltstone, light green, hard, spotted. 20% Sandstone, white to light green, very fine-grained, slightly calcareous; trace of interstitial pyrite. Trace of vein calcite.
3280	60% Claystone, medium gray, calcareous, as above. 20% Siltstone, light gray, spotted, calcareous. 20% Sandstone, white, very fine-grained, calcareous, only a trace of chlorite. Trace of interstitial pyrite. Trace of vein calcite. Trace of green siltstone.

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147 SS-A19 (1/9/86)h

Depth (feet)	Description
3300	60% Claystone, medium gray, spotted, calcareous, as above. 40% Sandstone, white to pale green, very fine-grained, calcareous. Trace of interstitial pyrite.
3320	60% Claystone, gray, spotted, calcareous, as above. 40% Sandstone, light gray to light green, calcareous, as above. Trace of disseminated pyrite.
3340	50% Claystone, medium gray, spotted, calcareous, as above. 40% Sandstone, light gray, fine to very fine-grained, as above. 10% Sandstone, white to light green, fine to medium-grained, slightly calcareous; trace of chlorite, some quartz overgrowth. Trace of vein calcite. Trace of spherulitic iron sulfide.
3380	60% Claystone, light to medium gray, spotted, calcareous, as above. 20% Sandstone, light gray, very fine-grained; trace of interstitial pyrite, as above. 20% Claystone, light green, calcareous, spotted; trace of stratiform pyrite. Trace of vein calcite. Trace of medium-grained sandstone, as above.
3400	60% Claystone, medium gray, spotted, calcareous, as above. 20% Claystone or siltstone, light green-gray, calcareous. 20% Sandstone, light green-gray, very fine-grained, calcareous. Trace of disseminated pyrite, some in stratified aggregate.

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147 SS-A20 (1/9/86)h

Depth (feet)	Description
3420	50% Claystone, medium gray, spotted, as above, calcareous. 30% Siltstone, light green-gray, calcareous, as above. 20% Sandstone, very fine-grained, light gray, as above. Trace of disseminated pyrite.
3440	60% Sandstone, light green-gray, calcareous, very fine-grained or siltstone; trace of disseminated pyrite. 40% Claystone, medium gray, spotted, calcareous, as above. Trace of siltstone, light green, calcareous.
3460	60% Claystone, medium gray, spotted, calcareous, as above. 40% Sandstone, light gray, very fine-grained or siltstone; trace of disseminated pyrite.
3470	60% Claystone, medium gray, spotted, calcareous, as above. 40% Sandstone, light green-gray, very fine-grained, calcareous.
3500-3510	90% Claystone, medium to dark gray, spotted with white microscopic authigenic mineral, as above, calcareous. 10% Sandstone, light gray, fine-grained, calcareous; trace of pyrite on laminae and interstitial.
3510-3515	90% Claystone, medium and dark gray, as above. 10% Sandstone, light gray, very fine-grained, as above.
3530-3540	90% Sandstone, fine-grained, light gray, calcareous. Sparse disseminated pyrite. 10% Claystone, medium to dark gray, spotted with white mineral, calcareous. Trace calcite vein material.

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147 SS-A21 (1/9/86)h

Depth (feet)	Description
3540-3550	60% Sandstone, as above. 40% Claystone, as above. Bands of pyrite.
3550-3560	90% Claystone, as above. 10% Sandstone, as above.
3560-3570	10% Claystone, as above. 90% Sandstone, light gray, calcareous. Sparse disseminated pyrite. Irregular patches of yellowish green epidote in matrix. flecks of darker green, apparent chlorite.
3570-3580	80% Claystone, medium dark gray, calcareous, "spotted", as above. 20% Sand, as above, but without epidote and chlorite.
3580-3590	60% Claystone, medium gray, as above. 30% Claystone, greenish-gray, otherwise identical to above. 10% Sandstone, as above.
3590-3600	50% Claystone, as above, medium gray to greenish-gray; some pyrite on bedding surface. 50% Sandstone, pale gray, fine-grained, calcareous.
3600-3610	85% Claystone, medium dark gray, spotted. 15% Sandstone, as above. A few flakes of chlorite.
3610-3620	95% Claystone, as above. 5% Sandstone, as above.
3620-3630	95% Claystone, medium dark gray, slightly greenish, white "splotches", as above, calcareous. Very little pyrite. 5% Sandstone, as above. No chlorite or epidote. Disseminated pyrite.

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147 SS-A22 (1/9/86)h

Depth (feet)	Description
3630-3640	60% Claystone, greenish-gray with white splotches, calcareous. 30% Claystone, medium dark gray with white splotches, calcareous. Layers of fine-grained pyrite. 10% Sandstone, pale gray, fine-grained, calcareous. Disseminated pyrite.
3640-3650	70% Sandstone, light gray, fine-grained, calcareous. Disseminated pyrite. 30% Claystone, gray to greenish gray, as above.
3650-3660	40% Claystone, medium dark gray, "splotchy", calcareous; bedded pyrite. 40% Siltstone, medium gray, calcareous. 20% Sandstone, as above. Trace chunks of clear calcite vein filling.
3660-3670	20% Claystone, medium dark gray to greenish-gray, as above. 80% Sandstone, light gray, fine-grained, calcareous. Disseminated pyrite. Trace of clear calcite vein filling.
3670-3680	20% Claystone, medium dark gray, as above, splotchy. 70% Siltstone, greenish-gray. 10% Sandstone, pale gray, fine-grained. Matrix often stained yellow/green by epidote. Trace clear calcite veins.
3680-3690	10% Claystone, medium dark gray, as above, calcareous. 80% Siltstone, pale greenish-gray with fine sand, calcareous. 10% Sandstone, pale gray, fine-grained, calcareous. Diffuse patches of epidote in groundmass.

147 SS-A23 (1/9/86)h

Depth (feet)	Description
3690-3700	10% Silty claystone, medium gray, calcareous; strings of fine pyrite. 85% Claystone, medium greenish-gray, calcareous; "splotches" appear to be feldspar. 5% Sandstone, pale gray, fine-grained. Matrix is a mixture of calcite and epidote.
3700-3710	95% Claystone, as above, calcareous. 2 1/2% Silty claystone, as above, calcareous. 2 1/2% Sandstone, as above.
3710-3720	80% Claystone, as above, calcareous. 15% Silty claystone, as above, calcareous. 5% Sandstone, as above, calcareous.
3720-3730	60% Claystone, medium dark gray, with white splotches; with strabound and disseminated pyrite, calcareous. 30% Claystone, pale greenish-gray, contains white splotches, fewer but larger than dark gray claystone, calcareous. 10% Sandstone, pale gray, fine-grained; disseminated pyrite, calcareous cement.
3730-3740	25% Claystone, medium dark gray, as above. 50% Claystone, pale greenish-gray, as above. 25% Sandstone, pale gray, as above.
3740-3750	25% Claystone, medium dark gray, calcareous; disseminated pyrite, approx. 0.5 mm. 50% Claystone, pale greenish-gray, calcareous; fine disseminated pyrite. 25% Sandstone, pale gray, fine-grained, calcareous; fine disseminated pyrite.
3750-3760	40% Claystone, medium dark gray, as above. 40% Claystone, pale greenish-gray. 20% Sandstone, pale gray, very fine-grained, calcareous. Pyrite very sparse.

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147 SS-A24 (1/9/86)h

Depth (feet)	Description
3760-3770	20% Claystone, medium dark gray with white splotches, calcareous. 60% Claystone, pale greenish-gray with white splotches, calcareous. 20% Sandstone, pale gray, as above.
3770-3780	30% Claystone, medium dark gray, as above. 60% Claystone, pale greenish-gray. 10% Sandstone, pale gray, as above.
3780-3790	60% Claystone, medium gray to greenish-gray, colors appear gradational, calcareous. 40% Sandstone, pale gray, very fine-grained, calcareous; pyrite very sparse.
3790-3800	90% Claystone to siltstone, medium gray to grayish-green, calcareous. Very fine disseminated pyrite. 10% Sandstone, pale gray, very fine-grained calcite cement. Unaltered occasional minor epidote in matrix.
3800-3810	40% Siltstone, medium gray, calcareous. 50% Claystone, greenish-gray, calcareous. Some cut by veins of pyrite. 10% Sandstone, pale gray, very fine, calcareous, unaltered.
3810-3820	As above. A few pieces of anhydrite.
3820-3830	As above.
3830-3840	30% Siltstone, medium dark green, calcareous. 60% Claystone, greenish-gray, calcareous. 10% Sandstone, as above.
3840-3850	As above.
3850-3860	Claystone, as above.
3860-3870	Claystone, as above.

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147 SS-A25 (1/9/86)h

Depth (feet)	Description
3870-3880	Sedimentary breccia, greenish-gray. Angular clasts of claystone up to 3mm in a matrix of greenish clay and calcite. Then calcite veins. Disseminated pyrite.
3880-3890	As above.
3890-3900	As above.
3900-3910	90% Sedimentary breccia, as above. 10% Siltstone, medium gray, calcareous, as above.
3910-3920	10% Breccia, as above. 80% Claystone, pale greenish-gray, calcareous. 10% Sandstone, pale gray, fine-grained, calcareous.
3920-3930	50% Silty claystone, medium gray, calcareous, with veins of pyrite. 40% Claystone, pale greenish-gray, calcareous. 10% Sandstone, pale gray, very fine-grained, calcareous.
3930-3940	As above. Free chunks of pyrite are common.
3940-3950	50% Silty claystone, medium gray, calcareous. 20% Claystone, as above. 30% Sandstone, pale gray, calcareous, sparse pyrite and flecks of chlorite(?).
3950-3960	10% Silty claystone, as above. 85% Claystone, pale greenish-gray, as above. 5% Sandstone, as above.
3960-3970	45% Silty claystone, as above. 50% Claystone, pale greenish-gray, as above. 5% Sandstone, as above.
3970-3980	10% Silty claystone, medium gray, as above. 85% Claystone, greenish-gray, as above. 5% Sandstone, as above.

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147 SS-A26 (1/9/86)h

Depth (feet)	Description
3980-3990	60% Silty claystone, as above. 40% Claystone, greenish-gray. A few pieces of sedimentary breccia, as in 3870-3910.
3990-4000	As above.
4000-4010	80% Claystone, pale greenish-gray, calcareous. 20% Claystone, medium gray, cut by veins of pyrite. Minor pieces of anhydrite.
4010-4020	As above.
4020-4030	As above. Pieces of vein anhydrite.
4030-4040	Claystone, pale greenish-gray, calcareous. Sparse pyrite (most in the medium gray). Few pieces of calcite vein material.
4040-4050	Claystone, pale greenish, calcareous, as above.
4050-4060	As above.
4060-4070	As above.
4070-4080	As above.
4080-4100	As above.
4100-4120	Claystone, pale gray, calcareous, spotted. No pyrite or vein filling.
4120-4140	As above.
4140-4150	As above. Thin veins filled with calcite.
4150-4160	Sandstone, light gray to pale greenish-gray. Calcite cement. Disseminated pyrite and matrix epidote common.

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147 SS-A27 (1/9/86)h

<u>Depth (feet)</u>	<u>Description</u>
4160-4170	60% Sandstone, as above. 40% Claystone, greenish-gray, as above.
4170-4180	As above.
4180-4190	Siltstone/claystone, medium gray, calcareous. Disseminated pyrite spotted with some unidentifiable darker material (maybe bleached).
4190-4200	60% Siltstone, as above. 40% Claystone, pale greenish-gray, calcareous. Very finely spotted. Very sparse pyrite.
4200-4210	50% Siltstone, medium gray, calcareous. Some with pieces of vein-composed of epidote and quartz. 30% Claystone, greenish-gray, as above. 20% Sandstone, light gray, very fine-grained, with disseminated pyrite and epidote.
4210-4220	80% Siltstone, medium gray, as above. 10% Claystone, greenish-gray, as above. 10% Sandstone, pale gray, very fine-grained. Matrix stained with epidote. Trace pieces of calcite vein filling and crystals of sphalerite.
4220-4230	As above.
4230-4240	As above. No sphalerite observed.

147 SS-A28 (1/9/86)h

Depth (feet)	Description
4340-4350	80% Siltstone, medium dark gray to pale gray, calcareous, spotted with unidentifiable white material. Light gray appears to be bleached version of the dark sparse disseminated pyrite. Pieces of chalcopyrite vein filling. 15% Sandstone, light gray, calcareous. Matrix often spotted with epidote. Sparse pyrite and some flakes of chlorite. Some have darker green matrix. 5% Claystone, pale greenish-gray, calcareous, spotted.
4350-4360	As above.
4360-4370	As above. Sulfides sparse.
4370-4380	80% Siltstone, as above. 20% Sandstone. Matrix altered green or yellowish-green or not. Disseminated pyrite.
4380-4390	70% Siltstone, medium dark gray to pale gray, as above. 30% Sandstone, pale gray, calcareous. Matrix essentially unaltered.
4390-4400	90% Siltstone, as above. 10% Sandstone, as above.
4400-4410	90% Siltstone or silty claystone, as above. 10% Sandstone, as above. Trace of claystone, pale greenish-gray.
4410-4420	As above.
4420-4430	90% Silty claystone, as above. 10% Sandstone, as above.
4430-4440	50% Silty claystone, as above. 45% Siltstone, pale gray. 5% Sandstone. Trace pieces of epidote vein filling.

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147 SS-A29 (1/10/86)h

Depth (feet)	Description
4440-4450	50% Siltstone, medium gray, as above. 40% Claystone, pale greenish-gray. 10% Sandstone. <1% Epidote vein material. Some silica vein filling.
4450-4460	70% Claystone, light greenish-gray, spotted, non-calcareous. 20% Siltstone, medium to light gray, slightly calcareous. 10% Sandstone, matrix non-calcareous. Increasing amounts of epidote vein filling.
4460-4470	80% Claystone, as above. 15% Siltstone, as above; sparse sulfides. 5% Sandstone and increasing epidote vein filling.
4470-4480	85% Claystone, as above. 10% Siltstone. 3% Sandstone. 2% Epidote vein filling.
4480-4490	95% Claystone, pale greenish-gray, calcareous. 3% Epidote vein fillings. 2% Sandstone, fine-grained.
4490-4500	95% Claystone, as above. 4% Siltstone, as above. 1% Epidote vein filling.
4500-4510	Claystone, light gray to greenish-gray, calcareous; sparse disseminated pyrite.
4510-4520	Claystone, medium gray to nearly white, non-calcareous; disseminated pyrite. Trace of epidote vein filling.
4520-4530	As above. Trace of epidote/calcite vein filling.
4530-4540	As above.

147 SS-A30 (1/10/86)h

Depth (feet)	Description
4540-4550	95% Claystone, as above. 5% Fine sandstone, matrix partly altered to epidote.
4550-4560	40% Claystone, as above. 60% Sandstone, pale gray, very fine, matrix altered to epidote. Minor disseminated sulfides.
4560-4570	As above.
4570-4580	As above. Some sands matrix completely altered to epidote.
4580-4590	80% Sandstone, as above. 20% Claystone.
4590-4600	50% Claystone. 50% Sandstone, as above.
4600-4610	25% Claystone, medium gray to green gray, spotted, slightly calcareous. 25% Siltstone, light to medium gray, non-calcareous. 50% Sandstone, pale gray, non-calcareous, fine-grained. Matrix mottled with yellow-green epidote.
4610-4620	30% Claystone, medium gray to greenish-gray, spotted, calcareous. 40% Siltstone, light gray, non-calcareous. 30% Sandstone, pale gray to yellow-green, very fine-grained, non-calcareous. Trace of calcite vein material, epidote vein.
4620-4630	As above.
4630-4640	As above.

147 SS-A31 (1/10/86)h

Depth (feet)	Description
4640-4650	50% Claystone, medium gray to greenish-gray, spotted, calcareous. 40% Siltstone, pale gray, calcareous. 10% Sandstone, pale gray, fine-grained, calcareous. Trace pieces of chalcopyrite, calcite vein and epidote vein.
4650-4660	90% Claystone, medium gray to greenish-gray, spotted, non-calcareous, sparse disseminated sulfide. 3% Siltstone, as above. 2% Sandstone, as above. Trace epidote/calcite vein filling, cubes of pyrite up to 1mm.
4660-4670	90% Claystone, greenish-gray, non-calcareous, spotted. 5% Siltstone, light gray, non-calcareous. 5% Sandstone, light gray, non-calcareous, fine-grained. 2% Epidote/calcite vein filling.
4670-4680	As above.
4680-4690	As above. Trace of specular hematite flakes.
4690-4700	As above.
4700-4710	As above. Vein fillings of epidote, epidote + calcite, epidote + calcite + specular hematite.
4710-4720	80% Claystone, light greenish-gray, spotted, non-calcareous; cut by veinlets of epidote and calcite. Very sparse disseminated sulfides. 20% Siltstone, light greenish-gray, non-calcareous. Matrix spotted (with epidote?).

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147 SS-A32 (1/10/86)h

Depth (feet)	Description
4720-4730	75% Claystone, as above. 20% Siltstone. 3% Claystone, light gray to medium dark gray, calcareous. 1-2% Vein filling epidote, clear vein calcite, replacement epidote. Trace of specular hematite.
4730-4740	As above, but without the gray calcareous claystone.
4740-4750	75% Claystone, gray/green-spotted, non-calcareous; very sparse, disseminated pyrite. 20% Siltstone, light green/gray. Non-calcareous. 3% Sandstone, light yellow-green. Matrix replaced by epidote.
4750-4760	80% Claystone, gray/green, non-calcareous, as above. Cut by calcite-epidote-hematite veins. 15% Siltstone, as above. 3% Sandstone, very fine-grained. Altered to yellow-green. 3% Sandstone, very fine-grained, altered to yellow-green. 2% Epidote-calcite-hematite vein material. Pieces of clear calcite vein. Few pieces of chalcopyrite.
4760-4770	As above.
4770-4780	As above.
4780-4790	As above.
4790-4800	As above.
4800-4810	As above.
4810-4820	As above.

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147 SS-A33 (1/10/86)h

Depth (feet)	Description
4820-4830	40% Claystone, greenish-gray, spotted, non-calcareous. 30% Claystone, medium gray to medium dark gray, spotted, non-calcareous. 25% Claystone, light gray, spotted, calcareous. 3% Sandstone, yellow-green, very fine-grained, non-calcareous. 2% Epidote-calcite-hematite vein filling.
4830-4840	30% Claystone, greenish-gray, spotted, non-calcareous. 50% Claystone, light to medium gray, spotted, non-calcareous. 15% Claystone, medium dark gray to dark gray spotted, non-calcareous. 3% Sandstone, yellow-green, very fine-grained, non-calcareous. 2% Vein fillings, epidote and calcite, with minor hematite.
4840-4850	As Above.
4850-4860	25% Claystone, greenish-gray, as above. 70% Claystone or silty claystone, light gray grading to medium dark gray, non-calcareous. 4% Sandstone, yellow-green to spotty light gray, very fine-grained, non-calcareous. 1% Vein filling of calcite-epidote. Trace of siltstone, oolitic-appearing. Dark gray matrix with 50% tiny white spherical bodies <0.02 mm diam. Some appear to have a concentric structure.
4860-4870	As above. Calcite-epidote vein fillings decrease.
4870-4880	Claystone to silty claystone, medium gray to medium dark gray, spotted, non-calcareous; cut by minor calcite-epidote veins. Trace of dark gray "oolite".

147 SS-A34 (1/10/86)h

2541

Depth (feet)	Description
4880-4890	70% Claystone, greenish-gray, spotty, non-calcareous. 20% Claystone, light to medium dark gray, spotty, non-calcareous, cut by epidote calcite veins. 7% Sandstone, yellow-green, non-calcareous, very fine-grained. 3% Epidote-calcite vein filling.
4890-4900	70% Claystone, greenish-gray, spotted, non-calcareous. Common disseminated pyrite and chalcopyrite. 20% Claystone, light to medium dark gray, spotty, non-calcareous; cut by epidote-calcite veins. 7% Sandstone, yellow-green, non-calcareous, very fine-grained. 3% Epidote-calcite vein filling
4900-4910	As above.
4910-4920	As above, with pyrite cubes, 1 mm diam.
4920-4930	As above.
4930-4940	As above.
4940-4950	90% Claystone, medium gray to greenish-gray, spotted, non-calcareous; cut by epidote veinlets. Disseminated pyrite confined to the greenish type. 10% Sandstone, very fine-grained to siltstone. Matrix yellow-green, non-calcareous. Trace of vein epidote, cubes of pyrite up to 1.5 mm.
4950-4960	90% Claystone, light gray to greenish gray, spotted, non-calcareous; cut by epidote veinlets. Very sparse disseminated pyrite. 10% Sandstone, very fine-grained, to siltstone. Matrix yellow-green, non-calcareous. Trace vein epidote, cubes of pyrite up to 1.0 mm.

147 SS-A35 (1/10/86)h

Depth (feet)	Description
4960-4970	As above.
4970-4980	As above.
4980-4990	As above. (Most cuttings are rather large; may represent sloughed material). Trace vein epidote, cubes of pyrite, few flakes of hematite.
4990-5000	85% Claystone, greenish-gray, as above. 15% Sandstone and siltstone, as above. Trace of vein epidote.
5000-5010	85% Claystone, greenish-gray to medium gray, spotted, non-calcareous. Minor disseminated pyrite. 14% Sandstone. Matrix white spotted with yellowish green, fine to very fine-grained, non-calcareous, with disseminated pyrite. 1% pieces of epidote vein filling, sparry calcite, pyrite cubes 1.5 mm diam.
5010-5020	As above. Sandstone with a few flecks of dark green chlorite(?).
5020-5030	80% Claystone, as above. 20% Sandstone, as above. Trace epidote and sparry calcite vein filling, cubes of pyrite.
5030-5040	As above.
5040-5050	As above. Some pieces of claystone cut by epidote veins. Pieces of vein filling may be epidote, epidote + calcite, epidote + pyrite, or sparry calcite alone.
5050-5060	As above. Sand approx. 10%.
5060-5070	As above. 20% Sandstone. Trace of specular hematite in epidote veins.

147 SS-A36 (1/10/86)h

Depth (feet)	Description
5070-5080	As above. Trace of specular hematite.
5080-5090	As above.
5090-5100	95% Claystone, as above. 5% Sandstone, as above. Trace of vein filling epidote, calcite, specular hematite and pyrite.
5100-5110	Claystone, medium gray to greenish-gray, non-calcareous, spotted. Very sparse disseminated pyrite Trace of sandstone, as above, and vein material. * Chips are large, 5-7 mm. May not represent the true lithology at bottom.
5110-5120	90% Claystone, light gray to greenish-gray, non-calcareous, spotted. Small disseminated pyrite and chalcopryrite, cut by epidote veins. 10% Sandstone, yellowish green to dark green with yellowish green blotches. Fine disseminated pyrite and chalcopryrite. Trace of epidote, calcite, pyrite vein fillings. * High proportion of large chips.
5120-5130	As above.
5130-5140	As above.
5140-5150	40% Claystone, greenish-gray, spotted, non-calcareous, no sulfides. 50% Claystone, medium dark gray, spotted, non-calcareous. No sulfides. 10% Sandstone. Matrix mottled white and yellow green. Fine to very fine-grained, non-calcareous, unmineralized. Trace of epidote, calcite, pyrite vein fillings.

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147 SS-A37 (1/10/86)h

Depth (feet)	Description
5150-5160	As above.
5160-5170	Claystone, medium gray to medium dark gray, calcareous, spotted. Minor disseminated pyrite. Shows indistinct cleavage and shun on cleavage surfaces. 2% Sandstone, as above. Probably sloughed.
5170-5180	As above. Trace of sandstone, as above.
5180-5190	40% Claystone, medium dark gray, spotted, slightly calcareous, indistinct cleavage, with faint sheen on cleavage surface. Rare thin laminations of pyrite. 60% Claystone, medium gray, calcareous.
5190-5200	30% Claystone, medium dark gray, spotted, as above. 70% Claystone, medium gray, as above.
5200-5210	50% Claystone, medium dark gray, as above. 50% Claystone, medium gray, as above.
5210-5220	20% Claystone, medium dark gray, slightly calcareous, as above. Small pyrite lenses. 80% Silty claystone, light gray, calcareous.
5220-5230	10% Claystone, medium dark gray, spotted, slightly calcareous. 90% Silty claystone, light greenish gray, calcareous, spotted.
5230-5240	30% Claystone, medium gray, somewhat silty, spotted, slightly calcareous. Minor pyrite lenses. 40% Claystone, slightly silty, light greenish gray, calcareous. 30% Silty claystone, light gray, calcareous. Disseminated pyrite common.

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147 SS-A38 (1/10/86)h

Depth (feet)	Description
5240-5250	50% Claystone, medium gray, somewhat silty, spotted, slightly calcareous. Thin lenses of pyrite. 20% Claystone, light greenish-gray, somewhat silty, calcareous. 30% Silty claystone, light gray, calcareous. Common disseminated pyrite.
5250-5260	60% Claystone, gray, calcareous, spotted, as above. 40% Claystone, light gray-green, as above. Trace of disseminated pyrite. Trace of sandstone, light gray, very fine-grained. Trace of disseminated pyrite (arkosic).
5260-5270	60% Claystone, gray, as above. Trace of stratobound pyrite. 40% Claystone, gray-green, as above. Trace of sandstone, medium-grained, angular, arkosic. Trace of disseminated pyrite. Trace of sandstone with epidote in matrix.
5270-5280	70% Claystone, gray, as above. 30% Claystone, gray-green, as above. Trace of epidote in calcite veinlet.
5280-5290	70% Claystone, light gray-green, as above; minor granular pyrite _____. 30% Claystone, light to medium gray. Trace of disseminated pyrite. Trace of sandstone, light gray, fine-grained, arkosic. Trace of disseminated pyrite. Trace of calcite veinlet.
5290-5300	70% Claystone, light gray-green, as above. 30% Claystone, light to medium gray, as above. Trace of sandstone, light gray, fine-grained, arkosic, as above.
5300-5310	70% Claystone, light gray-green, as above. 30% Claystone, light to medium gray, as above. Trace of sandstone, very fine-grained, light gray, arkosic(?).

147 SS-A39 (1/14/86)h

Depth (feet)	Description
5310-5320	70% Claystone, light gray-green, as above. 25% Claystone, light to medium gray, as above. 5% Sandstone, yellow green and gray, fine-grained, arkosic. Abundant yellow-green epidote, partly replacing feldspar in arkose. Trace of disseminated pyrite. Trace of dark-green epidote veinlets. Trace of calcite veinlets.
5320-5330	80% Claystone, light gray-green, as above; trace of granular stratiform pyrite. 20% Claystone, medium gray, as above. Trace of sandstone with epidote in matrix. Trace of epidote veinlets. Trace of calcite veinlets.
5330-5340	85% Claystone, light gray-green, as above. 10% Claystone, medium gray, as above. 5% Sandstone, yellow-green and gray, very fine to fine-grained, abundant epidote and trace of pyrite. Trace of epidote veinlets with clear anhydrite(?) blobs.
5340-5350	90% Claystone, light gray-green, as above. 5% Claystone, gray, as above. 5% Sandstone, with pyrite and epidote, as above. Trace of epidote veinlets.
5350-5360	60% Claystone, light gray-green, as above. 40% Claystone, medium gray, as above. Trace of sandstone with epidote, as above. Trace of stratabound, granular pyrite.
5360-5370	60% Claystone, light gray-green, as above. 40% Claystone, medium gray, as above. Trace of sandstone with epidote and pyrite.
5370-5380	50% Claystone, light gray-green, as above. 50% Claystone, light to medium gray, as above.

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147 SS-A40 (1/14/86)h

Depth (feet)	Description
5380-5390	50% Claystone, light gray-green, as above. 50% Claystone, medium gray, as above.
5390-5400	70% Claystone, light gray-green, as above. 30% Claystone, medium gray, as above. Trace of sandstone, very fine-grained, with epidote in matrix. Trace of disseminated pyrite.
5400-5410	80% Claystone, light gray-green, as above. 20% Claystone, medium gray, as above. Trace of sandstone, yellow-green, very fine-grained to fine-grained, with abundant epidote matrix. Trace of disseminated pyrite.
5410-5420	90% Claystone, light gray-green, as above. 10% Claystone, medium gray, as above. Trace of disseminated pyrite. Trace of sandstone, very fine-grained, with epidote in matrix.
5420-5430	70% Claystone, silty, light gray-green, calcareous, trace of pyrite in patches. 30% Claystone, medium gray, calcareous. Trace of sandstone, very fine-grained, yellow-green, epidote-rich. Trace of epidote veinlets.
5430-5440	60% Claystone, silty, light gray-green, as above. 40% Claystone, medium gray, spotted, as above. Trace of pyrite on laminae. Trace of epidote veinlet.
5440-5450	70% Claystone, silty, light gray-green, calcareous; trace of epidotization. 30% Claystone, gray, spotted, as above. Trace of sandstone, fine and very fine-grained, light yellow-green, abundant matrix epidote and trace of pyrite. (Sandstone and epidote slightly more abundant than above.)

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147 SS-A41 (1/14/86)h

Depth (feet)	Description
5450-5460	50% Claystone, silty, light green, spotted, calcareous, with trace of lenses of fine-grained pyrite. 25% Sandstone, yellow-green, fine to very fine-grained, arkosic, epidotized, trace of chlorite. Trace of epidote veinlets. Trace of large pyrite crystals. 15% Claystone, medium gray, spotted, as above. 10% Epidote, probably vein fragments, some open crystal-lined vugs.
5460-5470	50% Claystone, silty, light green, as above. 25% Claystone, medium gray, as above, with lenses of granular pyrite. 20% Sandstone, very fine to fine-grained, epidotized, as above. 5% Epidote, mainly from veins.
5470-5480	70% Claystone, light green, as above. Trace of thin epidote and specular hematite veinlets and pyrite. 20% Sandstone, very fine-grained, epidotized with trace coarse pyrite crystals and minor specular hematite. 10% Claystone, medium gray, as above. Trace of vein epidote with open crystal-lined areas.
5480-5490	60% Claystone, light green, as above. 30% Sandstone, yellow-green, very fine-grained, epidotized, with trace of large pyrite porphyroblasts. 10% Claystone, medium gray, as above. Trace of vuggy epidote veinlets and epidote-calcite veinlets.
5490-5500	70% Claystone, light green, spotted, as above, with trace of pyrite porphyroblasts. 25% Sandstone, very fine-grained, epidotized. 5% Claystone, medium gray, as above. Trace of epidote veinlets, minor open vugs. Trace of calcite veinlets. Trace of specular hematite veinlet.

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147 SS-A42 (1/14/86)h

Depth (feet)	Description
5500-5510	70% Claystone, light to medium gray-green, as above, spotted with white authigenic mineral. Trace of pyrite porphyroblasts. 20% Sandstone, yellow-green, very fine-grained, epidotized, trace of pyrite porphyroblasts. 10% Claystone, medium gray, as above. Trace of epidote veinlets. Trace of granular, specular hematite.
5510-5520	60% Claystone, light gray-green, as above. 40% Sandstone, yellow-green, fine to very fine-grained, as above. Trace of interstitial specular hematite. Minor pyrite porphyroblasts. Trace of epidote veinlets. Trace of dark red-brown hematite(?).
5520-5530	70% Claystone, light to medium green, as above, spotted, with stratabound granular pyrite laminae, pyrite porphyroblasts and thin epidote veinlets. 30% Sandstone, yellow-green very fine-grained, as above. Epidotized. Trace of disseminated specular hematite. Increasing (trace) of dark red-brown translucent hematite (in thin bedded crystals).
5530-5540	80% Claystone, light to medium green, as above, with granular pyrite laminae and rare pyrite porphyroblasts. Trace of epidote veinlets. 20% Sandstone, yellow-green, epidotized, as above, with epidote veinlets. Trace of claystone, gray, calcareous, spotted.
5540-5550	80% Claystone, silty or siltstone, light to medium green, few epidote veinlets. Trace of granular pyrite. 20% Sandstone, yellow-green, as above, epidotized. Trace of hematite, dark red-brown, translucent on thin edges.

147 SS-A43 (1/14/86)h

Depth (feet)	Description
5550-5560	90% Claystone or siltstone, light to medium green and gray-green; trace of stratabound granular pyrite. Trace of epidote veinlets. 10% Sandstone, yellow-green, epidotized, as above. Trace of intergranular chalcopryrite. Trace of quartz-epidote veinlet. Trace of red-brown hematite (as above). Possible trace of red-brown sphalerite.
5560-5570	80% Claystone, light to medium green and gray-green, as above. Trace of calcite and epidote veinlets, some open and crystal-lined. Masses of granular, stratiform(?) pyrite. Trace of pyrite porphyroblasts. 20% Sandstone, yellow-green, epidotized, as above. Trace of intergranular specular hematite. Trace of pyrite porphyroblasts. Trace of epidote veinlets, partly open, crystal-lined. Trace of dark, red-brown hematite(?) veinlet.
5570-5580	90% Claystone, light to medium gray-green, slightly calcareous, spotted. 10% Sandstone, yellow-green, very fine-grained, epidotized. Trace of specular hematite veinlet. Trace of epidote veinlet.
5580-5590	90% Claystone, light and dark green, as above. 10% Sandstone, yellow-green, epidotized, as above. Trace of dark-green epidote veinlet.
5590-5600	40% Claystone(?), white, bleached, altered; trace of granular pyrite aggregate. 30% Claystone, light to medium gray-green, as above; trace of pyrite porphyroblasts. 30% Claystone, medium gray, slightly calcareous, spotted, white. Trace of sandstone, yellow-green, as above, with trace of pyrite porphyroblasts. Trace of epidote veinlet.

147 SS-A44 (1/14/86)h

Depth (feet)	Description
5600-5610	45% Claystone, medium gray, spotted, as above. 45% Claystone, light to medium green, spotted, as above. 10% Claystone/argillite, white, as above. Trace of sandstone, yellow-green, epidotized, as above. Trace of epidote veinlet.
5610-5620	90% Claystone, light to medium green; trace of granular pyrite aggregates; trace of epidote veinlet. 10% Claystone, medium gray, as above. 10% Claystone, white, bleached, as above. Trace of sandstone, yellow-green, very fine-grained, epidotized, as above. Trace of epidote veinlet.
5620-5630	80% Claystone, light gray-green, as above. Trace of epidote veinlets and granular pyrite aggregates. 15% Claystone, medium gray, spotted, as above. 5% Sandstone, very fine-grained, yellow-green, epidotized. Trace of white, altered claystone. Trace of calcite-sphalerite (dark red-brown) veinlet. Trace of specular hematite.
5630-5640	60% Claystone, light green, as above. 20% Claystone, light gray, bleached, as above. 20% Claystone, medium to dark gray, as above. Trace of sandstone, yellow-green, epidotized.
5640-5650	80% Claystone, light to medium gray-green, as above. 20% Claystone, medium to dark gray, as above. Trace of sandstone, yellow-green, epidotized.
5650-5660	80% Claystone, light gray-green, as above. 15% Claystone, light to medium gray, as above. 5% Sandstone, yellow-green, fine-grained, as above. Epidotized. Trace of granular stratabound pyrite.

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147 SS-A45 (1/14/86)h

Depth (feet)	Description
5660-5670	80% Claystone, light gray, calcareous, spotted, as above. 20% Claystone, light gray-green, as above. Trace of sandstone, yellow-green, epidotized.
5670-5680	Claystone, light to medium gray, as above. Trace of sandstone, yellow-green, epidotized.
5680-5690	80% Claystone, light gray, as above. 20% Claystone, light green-gray, as above. Trace of claystone, dark gray. Trace of sandstone, very fine-grained, white, moderately friable.
5690-5700	80% Claystone, light gray and light to medium gray, as above. 20% Claystone, light gray-green. Trace of sandstone, white, as above. Trace of calcite-pyrite veinlet.
5700-5710	90% Claystone, light to medium gray, as above. 10% Sandstone, white to light gray, very fine-grained, slightly friable. Trace of sandstone, yellow-green, epidotized. Trace of epidote veinlet. Trace of granular pyrite aggregate.
5710-5720	80% Claystone, light to medium gray, as above. 10% Claystone, light gray-green, as above. 10% Sandstone, white, as above. Trace of sandstone, yellow-green, epidotized. Trace of pyrite porphyroblasts (loose).
5720-5730	80% Claystone, light gray, as above. 10% Claystone, light gray-green, as above. 10% Sandstone, white to light gray, as above. Trace of sandstone, epidotized. Trace of granular pyrite in claystone.
5730-5740	80% Claystone, light to medium gray, as above. 10% Claystone, light gray-green, as above. 5% Sandstone, white, as above, with disseminated pyrite. 5% Sandstone, light yellow-green, fine to very fine-grained; trace of epidote stain.

147 SS-A46 (1/14/86)h

Depth (feet)	Description
5760-5780	80% Claystone, medium to dark gray, as above. 10% Claystone, light gray-green, as above. 10% Sandstone, light gray and yellow-green, partly epidotized, with trace of pyrite porphyroblasts.
5780-5790	80% Claystone, medium to dark gray, as above. 15% Claystone, light gray-green, as above. 5% Sandstone, white and yellow-green, as above.
5790-5800	90% Claystone, light to medium gray, as above. 10% Sandstone, light yellow-green to light gray, epidotized; trace of pyrite porphyroblasts.
5800-5810	50% Claystone, medium and dark gray, as above. 30% Claystone, light gray to green-gray, as above; trace of granular pyrite aggregates. 20% Sandstone, light gray and yellow-green, mostly epidotized; trace of pyrite porphyroblasts. Trace of red-brown, transparent mineral in matrix (sphalerite).
5810-5820	80% Claystone, light to medium gray, as above. 10% Siltstone, light gray, hard. 10% Sandstone, light gray to yellow-green, partly epidotized. Porphyroblasts of pyrite; trace of red-brown sphalerite(?).
5820-5830	90% Claystone, medium to dark gray, as above. 10% Sandstone, light gray with minor yellow-green, very fine-grained, minor epidotization. Trace of pyrite porphyroblasts. Trace of light green claystone. Trace of chalcopyrite(?).
5830-5840	45% Claystone, light to medium gray, as above. 45% Claystone, light gray-green, trace of granular pyrite aggregates. 10% Sandstone, white and yellow-green, minor epidotization, as above.

147 SS-A47 (1/14/86)h

Depth (feet)	Description
5840-5850	30% Claystone, medium gray, as above. 30% Claystone, light gray, as above. 30% Claystone, light gray-green, as above. 10% Sandstone, yellow-green and white, partly epidotized; trace of pyrite porphyroblasts.
5850-5860	50% Claystone, light gray-green, spotted, slightly calcareous to non-calcareous. Trace of granular aggregates of pyrite. Trace of epidote veinlet. 40% Claystone, medium to dark gray, spotted, calcareous. 10% Sandstone, white with trace of yellow-green epidotization, very fine-grained.
5860-5870	45% Claystone, light gray-green, as above. 45% Claystone, light and medium gray, as above. 5% Sandstone, white with common epidote in matrix, very fine-grained; pyrite porphyroblasts. 5% Epidote vein fragments with minor pyrite. Crystal-lined cavities indicate some vein porosity. Some veins may exceed 0.25" width.
5870-5880	80% Claystone, medium to dark gray, as above. 20% Claystone, light gray-green, as above. Trace of sandstone, epidotized. Trace of vein epidote and pyrite.
5880-5890	70% Claystone, medium to dark and light gray, as above. Trace of granular pyrite aggregates, some stratabound. 30% Claystone, light gray-green, as above. Trace of vein epidote.
5890-5900	60% Claystone, medium to dark gray, as above, with granular pyrite, as above. 40% Claystone, light gray-green, as above. Trace of sandstone, yellow-green, epidotized, with trace of pyrite porphyroblasts and shalerite (red-brown) in matrix.

147 SS-A48 (1/14/86)h

Depth (feet)	Description
5900-5910	80% Claystone, medium to dark gray, as above. 20% Sandstone, white, fine to very fine-grained. Trace of pyrite and dark red sphalerite(?) in matrix. Sphalerite(?) occasionally surrounds pyrite. Trace of green claystone. Trace of anhydrite(?) veinlet (white, crystalline, moderately soft, no reaction with HCl; pyritic). Trace of epidote veinlet.
5910-5920	90% Claystone, medium to dark gray, as above. 10% Sandstone, white, very fine-grained, as above. Trace of intergranular pyrite and sphalerite.
5920-5930	40% Claystone, medium to dark gray, as above. Trace of granular pyrite. 30% Claystone, light gray, similar to above. 20% Sandstone, white, very fine-grained, as above. 10% Claystone, medium green, spotted.
5930-5940	50% Claystone, dark gray, as above. 30% Claystone, light gray, as above. 20% Sandstone, white, fine to very fine-grained; trace of intergranular pyrite and red sphalerite.
5940-5950	50% Claystone, light gray, as above. 40% Claystone, dark gray, as above; trace of granular pyrite. 10% Sandstone, light gray to white, as above. Trace of intergranular pyrite and sphalerite.
5950-5960	80% Claystone or siltstone, light gray, hard, slightly calcareous. 15% Claystone, medium gray, as above. 5% Sandstone, white, as above.

147 SS-A49 (1/14/86)h

Depth (feet)	Description
5960-5970	45% Claystone or siltstone, light to medium gray, as above. 45% Claystone, medium to dark gray, as above. 10% Sandstone, white, as above, with trace of pyrite, epidote and red-brown sphalerite in matrix. Sandstone is slightly friable.
5970-5980	75% Claystone, dark gray, as above. Trace of calcopyrite(?). 20% Claystone or siltstone, light gray, as above. Trace of calcite-sphalerite filled hairline fracture. 5% Sandstone, white, slightly friable, as above. Trace of secondary feldspar(?) euhedra in sandstone.
5980-5990	45% Claystone, medium gray, as above, with trace of granular pyrite aggregates. 40% Claystone or siltstone, light gray, hard, with trace of fine granular pyrite. 15% Sandstone, white, fine to very fine-grained, slightly friable. Trace of green claystone, epidote fragment and epidotized sandstone.
5990-6000	60% Claystone, light to medium gray, as above. 30% Claystone, light gray-green, slightly calcareous, spotted, silty(?). Trace of granular pyrite aggregates. 10% Sandstone, very fine-grained, white, as above; a few chips contain epidote. Trace of epidote veinlet. Trace of sphalerite in calcite veinlet.

147 SS-A50 (1/14/86)h

Depth (feet)	Description
6400-6410	90% Claystone, medium gray to greenish gray, hard, non-calcareous. Minutely specked with white. Sparse vein fillings of epidote, pyrite and calcite. 10% Sandstone, very fine-grained. Matrix altered yellow-green. Non-calcareous. Sparse sulfides.
6410-6420	As above.
6420-6430	95% Claystone, predominantly greenish-gray. Hard, non-calcareous, finely specked with white. Cut by thin veins of epidote. 5% Sandstone, very fine-grained. Matrix altered to yellow-green. Non-calcareous, non-friable.
6430-6440	As above. Iron staining and cementing of cuttings apparently due to metal fragments.
6440-6450	As above.
6450-6460	95% Claystone, greenish gray with minor medium gray. Hard, non-calcareous, finely specked with white. 5% Sandstone, as above. Trace of epidote vein fillings, pyrite fragments.
6460-6470	50% Claystone, greenish-gray, as above. 45% Claystone, medium gray to medium dark gray; otherwise as above. 5% Sandstone, very fine-grained. Matrix only partly altered to light yellow. Non-calcareous. Sparse disseminated pyrite.
6470-6480	As above. Traces of vein pyrite and epidote. Trace of sandstone, very fine-grained. Matrix altered yellow-green.
6480-6490	As above.

147 SS-A51 (1/14/86)h

Depth (feet)	Description
6490-6500	95% Claystone, medium greenish-gray, as above. Sparse disseminated pyrite. Trace of sandstone, as above.
6500-6510	As above.
6510-6520	60% Claystone, greenish-gray, as above. 38% Claystone, medium dark gray, as above. <2% Sandstone, very fine-grained. Matrix altered to yellow-green, non-calcareous, non-friable.
6520-6530	As above.
6530-6540	As above. Trace of epidote and epidote + specular hematite vein filling.
6540-6550	As above. Vein fillings of epidote, epidote + euhedral pyrite. Sparse disseminated pyrite and chalcopryrite.
6550-6560	96% Claystone, greenish-gray, hard, non-calcareous, finely speckled with white. 3% Sandstone, very fine-grained. Matrix pale yellow to yellowish-green. Trace of epidote and epidote + sulfide vein filling. Pieces of vein filling specular hematite.
6560-6570	As above.
6570-6580	As above.
6580-6590	60% Claystone, greenish-gray, as above. 40% Claystone, medium gray; otherwise identical to green. Trace of sandstone, very fine, as above. Trace of epidote vein fillings.
6590-6600	As above.

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147 SS-B1 (1/20/86)h

APPENDIX B

STATE 2-14

CORE DESCRIPTIONS

<u>Depth (feet)</u>	<u>Description</u>
<u>CORE #1 (1553-1577) Rec. 24'</u> (Hand lens examination of exterior of core)	
1553-1553.5	Sandstone, medium gray, medium-grained, fair sorting, hard, calcareous. Cross-bedded. Carbonaceous partings. Irregular contact with underlying claystone due to soft sediment deformation.
1553.5-1558	Claystone, dark gray, silty, calcareous, moderately indurated, with thin (2" - <1/2") interbedded sandstone, light gray, very fine-grained. Abundant soft sediment deformation, including load deformation, cut and fill, slump folds, pinch and swell of sandstone layers. Bedding dips are variable in amount and direction, range up to 20° but generally are 10° or less. Most of this dip is initial dip. Detailed analysis is required to determine the amount of deformational dip, but it seems to be less than 10°.
1558-1570	Claystone, as above. Sandstone layers decrease in abundance and thickness to very thin laminae occasionally rhythmically interbedded with claystone.
1570-1577	Claystone, as above. Sandstone layers decrease further to scarce fine laminae. Thin tabular crystals of some white authigenic mineral (probably anhydrite) occur at 1571-1577 feet.

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147 SS-B2 (1/15/86)h

Depth (feet)	Description
<u>CORE #2</u> (1983-2012.2) Rec. 29.2' = 100% (Actually, recovery is hard to determine because it is rather broken up.)	
1983-1987	Conglomerate or breccia of predominantly claystone clasts with minor hard sandstone (fine to very fine-grained). This may be a slump breccia as many of the clasts are angular. Clasts float in a claystone matrix. Common small pyrite crystals are disseminated in the matrix. Clasts generally pebble-sized, with one large angular sandstone fragment (2 x 3 inches).
1987-1988	Claystone, dark gray, calcareous, interlayered with thin beds (down to thin laminae) of sandstone, very fine-grained, calcareous, hard. Attitude of layers is variable, up to about 30°, mostly initial dip. Soft sediment deformation features common.
1988-1991	Claystone, alternating medium and light gray colors, rhythmically layered, blocky, calcareous.
1991-1995	Claystone, medium gray, lacks lamination of previous segment. Very fine disseminated pyrite.
1995-1996.5	Claystone, light to medium gray, massive, grading into claystone-sandstone interlaminated section. Sandstone is light gray, very fine-grained, cross-bedded and showing soft-sediment deformation.
1996.5-2000	Claystone, light to medium gray colors interlaminated, calcareous, blocky.
2000-2012.2	Claystone, as above, with thin (1/2"-2") layers of sandstone, very fine-grained, calcareous.

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147 SS-B3 (1/15/86)h

Depth (feet)	Description
	Long high-angle to vertical fractures occur throughout the core, lined with calcite on the wall or filled with calcite. The veins are generally only 1/8-inch wide or less. Small patches of sulfide minerals occur in the center of the veins, including amber spha-lerite, galena, chalcopryite(?), bornite(?), and pyrite.

CORE #3 (2448-2478) Rec. 30'

2448-2456

Sandstone, light gray, very fine-grained, subangular, fair to good sorting, calcareous, in layers ranging from about 4 inches down to laminations less than 1/10 of an inch thick. The sandstone is interlayered with subordinate amounts of claystone and silty claystone, dark gray, calcareous. This interval shows extreme soft sediment deformation (contorted bedding, sediment dikes, slump breccia, penecontem-poraneous "faulting", etc.). Some of the slump faults are healed with calcite minerals found in Core 2. However, traces of spha-lerite occur at 2449.8 feet along a bedding plane in sandstone. Pyrite is present as very small crystals disseminated in the sandstone and claystone.

2456-2475

Sandstone and claystone as above but with less slump folding and breccia. Common small-scale offset of layers is present, probably slump or compaction faulting. Many sedimentary struc-tures are present (cross-bedding, rhythmic bedding, etc.). Sandstone is more abundant than claystone. The dip on the least-disturbed layers is about 20°, some part of which may be initial dip of the sediments.

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147 SS-B4 (1/15/86)h

<u>Depth (feet)</u>	<u>Description</u>
	Pyrite is present as disseminated crystals in the sandstone and as disseminated crystals and aggregates along bedding planes in claystone. A thin stratiform band of sphalerite occurs at 2469 feet.
2475-2478	Claystone, dark gray, and silty claystone, light gray, are rhythmically interbedded in this interval. Pyrite occurs as disseminated crystals in both. Many sealed hairline fractures, both high and low angle, occur. At least part of these appear to be penecontemporaneous slump or compaction fractures.
<u>CORE #4 (2970-3028.4) Rec. 58.4'</u>	
2970-2982	Siltstone, medium green-gray, calcareous, interlayered with thin beds and laminae of siltstone, medium gray, and thin layers of sandstone, very fine-grained to laminated, calcareous, silty. The sandstone is cross-bedded. Disseminated pyrite is present throughout. Calcite veinlets at 2970.5 and 2981 feet have epidote and pyrite. Much soft sediment deformation present.
2982-2992	Sandstone, light green, very fine-grained, cross-bedded, with calcite cement. Traces of epidote in cement. Trace of disseminated pyrite. Trace of sphalerite in thin calcite veinlet at 2987 feet. Sandstone has a few green claystone and siltstone partings.
2992-2995.5	Claystone, medium gray, silty, calcareous, spotted with white mineral floating in claystone. Mineral has blocky prismatic crystal form, in part, with epidote core

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147 SS-B5 (1/17/86)h

<u>Depth (feet)</u>	<u>Description</u>
	(authigenic anhydrite?; feldspar?; or detrital feldspar?). This is similar to the speckled siltstone and claystone seen in cuttings. Thin irregular layers of white crystalline mineral (anhydrite?) at 2991.9.
2995.5-3028.4	Siltstone, dark gray-green, interlayered with minor dark gray argillaceous siltstone partings. Grades down to sandy siltstone below 3004 feet. Blobs of partly bleached-out anhydrite(?) at 3014.9 feet. Long vertical fractures occur from 3015 to 3028 feet, lined with epidote on the wall, then calcite inboard. Sections of the vein contain fine large chalcopyrite crystals, with minor sphalerite and crusts of sooty-black, unidentified mineral. The most spectacular mineralization is in that part of the vein cutting as sandstone layers about 2 feet thick (3015-3107 feet).
<u>CORE #5</u>	This has been designated Core #5. Description of "Junk Basket Core" obtained while milling and recovering bit cores. The hole was deepened from 3078-3087 feet during this operation. Two junk basket runs were made in which large core pieces were recovered, as follows: The actual sample depths are somewhat uncertain but all of the material seems to come from this 9-foot interval:
3028-3080	No recovery (with regret)
Run 1 - 3080-3083	Sandstone, medium green, originally fine-grained, with common euhedral quartz overgrowth, minor film of green clay-like mineral in interstices. Minor interstitial pyrite euhedra. Trace of calcite cement. Rock is hard but slightly friable. Fractures (vertical) occur, about 0.1 inch width, both open and calcite-filled. Traces of specular hematite, pyrite and chalcopyrite occur in the veinlets and very small euhedral quartz crystals grow into the fractures. (Same size crystals as the grain overgrowths).

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147 SS-B6 (1/20/86)h

Depth (feet)	Description
Run 2 - 3083-3087	Sandstone, medium green, very fine-grained, silty(?), finer than in Run 1. The rock is hard but slightly friable, non-calcareous. Quartz overgrowths visible on some grains. Trace of black hematite(?) and pyrite. Occasional hard claystone fragments, dark green-gray, non-calcareous, up to 1.5 inches across, "float" in the sandstone. These are probably "rig-up" mud chips.

CORE #6 (3107-3167) Rec. 54.7' (91%).

3107-3114	Siltstone, dark green-gray, argillaceous, hard, non-calcareous, with thin laminae and thin beds of sandstone, very fine-grained, non-calcareous, light gray, with small-scale cross-bedding. Pyrite disseminated and in stratabound aggregates. Some soft-sediment deformation structures (especially sedimentary dikes). A few very thin high-angle fractures lined with epidote and filled with calcite with a trace of chalcopyrite. A large fracture (1/4"-1/2" wide) occurs at 3112'+. Some open, vuggy areas in siltstone are lined with pyrite euhedra. (These look like bleached out areas rather than fractures and are irregular, subparallel to bedding.) Thin laminar partings of dark gray silty claystone occur throughout.
3114-3115	Slump breccia(?) composed of angular clasts of siltstone and sandstone (pebble-granule size) floating in siltstone matrix. Some of this appears to be squeezed between larger (up to 1 foot long) slump blocks.

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147 SS-B7 (1/17/86)h

Depth (feet)	Description
3115-3119	Siltstone, dark green, interlayered and interlaminated with sandstone, fine to very fine-grained; and with thin laminae of claystone, dark gray, non-calcareous. Abundant soft-sediment deformation fractures (slump faulting, load features, etc.). Abundant disseminated pyrite. Few fractures, one of which is up to 1/2" wide (3116-3117), lined with epidote, partly filled with calcite rhombohedra(?) and partly open.
3119-3144	Sandstone, medium green, very fine to medium-grained, interlaminated and interbedded in thin beds with minor siltstone and a few partings of dark gray claystone. The fine and medium-grained sandstone shows abundant quartz pyrites present in stratiform accumulations along bedding planes and in a few thin vertical fractures located about 2" apart, partly open and partly calcite-filled. Few claystone "mud chips" in sandstone.
3144-3147	Sandstone, medium-grained, non-calcareous, common quartz overgrowths, friable, porous. Thinly laminated, carbonaceous fragments common on bedding planes.
3147-3148	Siltstone, dark green-gray, interlaminated with dark gray claystone and green siltstone. Non-calcareous, hard. Common disseminated pyrite.
3148-3156	Sandstone, fine-grained, medium green, slightly friable, thinly-bedded, with minor gray siltstone laminae. Much soft-sediment deformation.
3156-3161.7	Claystone, dark gray, non-calcareous, moderately hard; thinly interlaminated with siltstone and very fine-grained sandstone. A few thin vertical fractures lined with calcite and pyrite (0.1" wide). NO EPIDOTE on fractures. NOTE: dips on most bedding planes are low - about 5°.

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147 SS-B8 (1/20/86)h

Depth (feet) Description

CORE #7 (3470-3505) Rec. 34 ft (Run aborted when core barrel jammed.)

3470-3505

Claystone, medium gray, silty, calcareous, hard, interlaminated with light and dark gray claystone, siltstone and light gray, very fine-grained sandstone, hard, calcareous. Traces of very small pyrite crystals occur along bedding planes, especially in sandstone, along microfractures and disseminated in all lithologies. Many sedimentary structures are present such as, micro-crossbedding, cut and fill, sedimentary dikes and associated breccias, penecontemporaneous slump faulting, rhythmic bedding, etc.

The relative proportions of claystone, siltstone and sandstone vary throughout the core, but claystone appears to be more abundant from 3490'-3504', than above.

Reflective luster on claystone bedding planes suggests incipient mica development (sericite?). Fractures are scarce, dip about 60° from horizontal, are calcite-filled, narrow (<1/4"), with trace of pyrite. No epidote, chlorite or ore minerals were observed.

CORE #8 (379-3850) Recovered 56.6 ft. (94%)

3790-3795

Sedimentary breccia. Greenish-gray. Subangular granules of claystone in a clay matrix. Cut by thin calcite veins. Fine disseminated pyrite. Patchy anhydrite up to 2" diam.

3795-3797

Claystone, medium dark greenish-gray, structureless. Very fine disseminated pyrite. Minor fractured filled with calcite.

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147 SS-B9 (1/20/86)h

Depth (feet)	Description
3797-3807	Sandstone, light gray, very fine-grained, well-cemented with calcite, non-mineralized. Bedding 20° from horizontal. Approx. 20% siltstone, medium gray, beds 0.25-2" thick.
3807-3809	Siltstone, pale gray, structureless. Laminations of medium gray claystone, non-mineralized, calcareous.
3809-3813	Claystone, medium dark gray, calcareous. Cross-bedded with stringers of sand. Stratiform beds of pyrite and cross-cutting veinlets of calcite and pyrite.
3813-3816	Sedimentary breccia, subangular clasts up to 0.25" diam. Clasts of claystone, sandstone in a matrix of calcareous clay. Patches of anhydrite appear to have grown in place.
3816-3817	Claystone, medium dark gray. Fracture surfaces covered with calcite-pyrite.
3817-3821	Sandstone, pale gray, very fine-grained, calcareous cement. Non-mineralized interbedded claystone in beds <6" thick.
3821-3826	Interbedded claystone, medium dark gray, and siltstone, light gray.
3826-3828	Siltstone intruded by clastic dikes of fine sandstone.
3828-3834	Claystone and siltstone. Sand content increases downward.
3834-3840	Sandstone, light gray, calcareous cement. Non-mineralized. Few thin beds of claystone <0.25".
3840-3846.5	Very fine calcareous sandstone interbedded with medium gray claystone. Very fine disseminated pyrite. Siltstone content increases downward. Large piece of fracture filling epidote at bottom of core.

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147 SS-B10 (1/20/86)h

Depth (feet)	Description
<u>CORE #9 (4007-4069)</u>	
4007-4015	Claystone, medium dark gray, calcareous. Fine white specks of possible anhydrite or feldspar. Fine disseminated pyrite. Seams of pyrite and ovoid "nodules" of same are oriented parallel to bedding. Vertical fractures with calcite.
4015-4016	Sandstone, pale gray. Fine to very fine-grained. Calcareous cement. Cross-bedded. Sinusoidal-shaped laminae of gray claystone.
4016-4019	Claystone, medium dark gray, calcareous. Pyrite tends to occur in equant clots up to 3mm diam. Disseminated pyrite less than above. Ovoid bodies of anhydrite less than 1 cm diam. in stratiform zones inclined at about 20° from the horizontal. Small normal faults dip at approx. 60°.
4019-4020	Sandstone, as above. Some layers of intraformational breccia.
4020-4021	Sedimentary breccia. Subangular to subrounded granules of greenish-gray claystone in a matrix of same. Stratiform anhydrite clots and veins of calcite are subhorizontal.
4021-4050	Claystone, greenish gray, calcareous. Spotted with tiny anhydrite or feldspar. Disseminated fine pyrite and thin stratiform seams of same. Near vertical anastomosing veins of calcite <1mm thick common around 4025'. Sporadic vertical breccia zones. Matrix of breccia is clay. Bands of anhydrite interbedded with claystone at 4045.
4050-4053	Claystone.

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147 SS-B11 (1/20/86)h

<u>Depth (feet)</u>	<u>Description</u>
4053-4060	Breccia. Subangular to subrounded clasts of claystone up to 4 mm in a matrix of clay. Clastic dike altered to spheroidal anhydrite extends up to 4052'. No offset along contact.
4060-4069	Claystone, medium greenish-gray, calcareous, spotted with anhydrite or feldspar. Pyrite disseminated or in thin stratiform bands.

CORE #10 (4241-4299.4) (97°10)

4241-4247	Siltstone, medium dark gray, calcareous, and sandstone, light gray, very fine-grained with calcareous matrix. Sandstone cross-bedded and ripple marked. Near vertical vein up to 5 mm thick. Vein assemblage calcite>sphalerite>chalcopryrite>>pyrrhotite. Walls of smaller veins lined with epidote, calcite in center.
4247-4257	Sandstone, light gray, very fine-grained, calcareous, laminated. Load cast and flame structures at the base of sandstone laminae.
4257-4265	Sparse thin veins <1 mm, lined with calcite, sphalerite, chalcopryrite and pyrrhotite.
4265-4267	Sandstone, light gray, very fine-grained, non-mineralized. Interbedded with clay laminae. Flames and load casts at base of sand layers.
4267-4278	Claystone to silty claystone, medium gray with flecks of white. Disseminated fine sulfides with some in stratiform bodies of chalcopryrite. Thin horizontal veins of calcite + chalcopryrite + sphalerite(?).

147 SS-B12 (1/20/86)h

Depth (feet)	Description
4278-4288	Sandstone, light gray, very fine-grained, calcareous, cut by thin (<2 mm) vertical veins of calcite + epidote and calcite + chalcopryrite. Matrix variably altered to yellow-green epidote, especially near bottom. Claystone rip-ups near bottom.
4288-4291	Claystone, medium gray to greenish-gray. Color change seems gradational and patchy from alteration.
4291-4299	Sandstone, as above. Very little matrix alteration. Tends to break along thin laminations of claystone.

CORE #11 (4301-4336)

4301-4305	80% Sandstone, light gray, very fine-grained, calcareous. Sparse disseminated pyrite in complex soft-sediment deformation with 20% claystone, medium gray, calcareous, spotted.
4305-4310	Claystone to silty claystone, medium gray, calcareous, spotted with fine white mineral. Vertical fractures lined with calcite and minor sphalerite.
4310-4317	Claystone, as above. Veins, up to 5 mm thick, vertical, anastomosing, epidote + calcite + chalcopryrite + sphalerite + galena.
4317-4329	Claystone laminated with fine sandstone disrupted by vertical clastic dikes. 20% Sandstone, very fine-grained, light gray, in laminae <3 mm thick. 80% Claystone.

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147 SS-B13 (1/20/86)h

<u>Depth (feet)</u>	<u>Description</u>
4329-4336	Claystone, medium dark gray, calcareous, spotted; very sparse disseminated pyrite. Two sets of thin (<1 mm) fractures filled with calcite - one horizontal, one vertical. Horizontal band of anhydrite clots at 4335', apparently from diagenesis of sandy layer. Other anhydrite(?) follows polygonal fracture pattern. Sand increases toward bottom.

CORE #12 (4643-4681) (100%)

4643-4650	Silty claystone, medium dark gray, slightly calcareous. Patches of matrix altered to yellow-green epidote. Small disseminated pyrite in matrix. Cut by high-angle veins less than 5 mm thick. Veins filled with epidote and minor calcite.
4650-4654	Silty claystone, as above. Highly brecciated. Fractures 2 cm wide make up 50% of volume. Larger veins of epidote + pyrite + chalcoppyrite.
4654-4658	Silty claystone, as above, cut by veins of specular hematite. Hematite decreases downwards.
4658-4664	Sandstone, yellow-green. Matrix replaced by epidote, fine to very fine-grained, cut by thin (<1 mm) veins of epidote + calcite.
4664-4678	Claystone to silty claystone, cut by high angle veins of epidote + calcite + specular hematite + chalcoppyrite. Some pure hematite veins are 1 cm diam.

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147 SS-B14 (1/20/86)h

<u>Depth (feet)</u>	<u>Description</u>
4678-4681	Badly broken core. Appears to be about 2 ft of sandstone, greenish-yellow, fine-grained. Matrix replaced with epidote. Only minor mineralization.
4681-4681.5	Claystone to silty claystone, as above.

CORE #13 (4681.5-4683- app. 2.5 ft)

4681.5-4682	Sandstone, yellow-green, fine-grained. Matrix replaced by epidote. Thin, high angle veins of epidote cut by high angle hematite veins 2 cm thick. Alteration of country rock to epidote is greatest marginal to hematite veins. Hematite veins cut epidote + calcite veins.
4682-4683	Claystone, greenish-gray. Matrix non-calcareous. Disseminated crystalline epidote in matrix. Stratiform streaks of very fine light-colored sulfide. Thin veins of epidote + quartz + chalcopryrite + hematite.

CORE # 15 (5188-5218 ft) (100% recovered)

5188-5204	Argillite, medium dark gray, calcareous. Displays some fracture cleavage, but no slaty cleavage. Micaceous sheen on fracture surfaces. Contains a few stratiform lenses of pyrite less than 2 mm thick. Irregular, sinuous, vertical bodies of pyrite less than 2 cm long appear to be worm burrows. Rare small patches of calcite + chalcopryrite + sphalerite(?) are less than 1 mm in diameter and arranged in bands dipping at about 10°. Thin laminations of sandstone, medium gray, very fine-grained, calcareous. Dip at about 12°, and make up <<1% of the rock.
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147 SS-B15 (1/20/86)h

Depth (feet)	Description
5204-5211	Claystone, medium gray, calcareous. Similar to above, but lighter in color and lacking fracture cleavage and sheen on fracture surfaces. Thin laminations of siltstone inclined at about 10°.
5211-5218	Silty claystone, light gray, calcareous. Rare disseminated pyrite less than 0.5 mm diam. Minor thin laminations of claystone, light gray, calcareous. Stratiform bodies of pyrite + minor calcite up to 2x8 cm found below 5215'. Individual pyrite cubes 5 mm diam. Rare ovoid bodies of anhydrite up to 2 cm diameter appear to cut across stratification.
<u>CORE #16 (5574-5591) rec. 17'</u> (Much of core was in fragments - exact recovery uncertain.)	
5574-5575	Sandstone, medium green, very fine-grained, cross-bedded on small scale. Abundant disseminated pyrite and stratabound pyrite laminae. Common epidote-hematite veinlets 0.1" wide. Minor dark gray claystone laminae.
5575-5576.3	Claystone, dark green, cut by breccia zone dipping 60°. Breccia lined with epidote-hematite veinlets, with chalcopryrite.
5576.3-5580	Claystone, medium dark green-gray. Common microfractures dipping 45°-90°. Trace of epidote and calcite on fractures.
5580-5582	Claystone, dark gray-green, with thin laminae of sandstone, very fine-grained. Sandstone is epidotized and pyritic. Few high-angle fractures filled with calcite or epidote.

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147 SS-B16 (1/20/86)h

Depth (feet)	Description
5582-5590	Claystone, dark gray, with interlaminae of medium gray, silty claystone. Minor granular stratabound pyrite. Common high-angle fractures filled with calcite. Dip of laminae $5^{\circ}\pm$.
5590-5591	Argillite/claystone, light gray, bleached. Pyritic laminae and patches. Epidote lined microfractures.