



UNITED RESOURCES

Mineral Exploration Consultants
Economic Minerals Including Ground Water

ECONOMIC SILVER DEPOSITS: BY REDUCTION BUBBLE?

For A Confidential Client

by

Michael D. Campbell
Managing Director
United Resources
4735 Heaton Road
Columbus, Ohio

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INTRODUCTION

In pursuit of sandstone-type uranium deposits and development of the geochemical cell concept (Rackley, 1968), it became apparent that processes which operate to deposit uranium on solution fronts also deposit other economic minerals in much the same way. Because copper and silver deposits in sandstone have been described in detail in the literature, these elements were included with others in a list of likely ones to be found associated with solution fronts. On the basis of literature review Silver Reef, Utah was considered to be a good place to prove the presence of a solution front containing mostly silver.

FIELD EXAMINATION OF SILVER REEF, UTAH

Upon logging holes from earlier exploration by King Resources and General Exploration and Mining Company, it became apparent that the host rock for silver deposits, the so-called Leeds sandstone (Proctor, 1953), rather than being an unconformable separate unit is in fact a white-bleached former reddish sandstone... apparently the most permeable sandstone unit in this part of the Triassic Chinle formation. Reduction of reddish clays to greenish hues in and around the white-bleached sandstone and other clues clearly signal overall reduction of diagenic origin wherein white-bleached sandstone were developed from reddish ones in the Chinle formation.

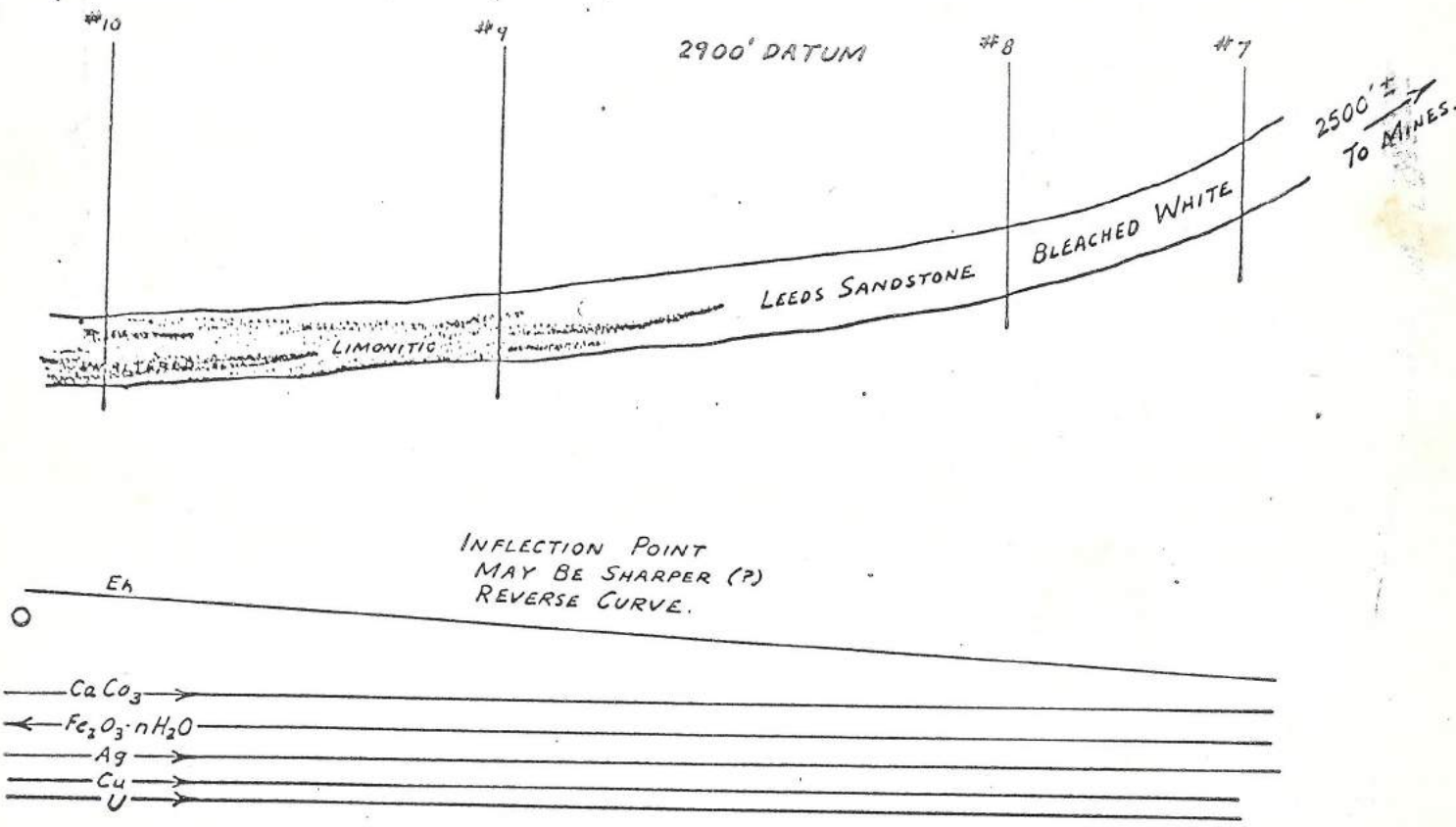
Figure 1 shows the location of the logged holes, previous claims, topography, etc. Figure 2 is a generalized cross section of exploratory holes number 7, 8, 9, and 10, and Figure 3 is a larger-scale, more detailed cross section upon which

Figure 2 is based. In the Appendix are detailed lithologic logs of the exploratory holes 7, 8, 9, and 10.

Note that Figures 2 and 3 and supporting data show an overall chemico-physical situation that is opposite to what one would expect in terms of "down-dip" exploration for a uranium solution front.

A field examination was made at Silver Reef. The work clearly shows (1) that the so-called Leeds sandstone is epigenitically white-bleached reddish Chinle sandstone, (2) that there is symmetry of pertinent chemico-physical characteristics about the axis of the major anticline (the Virgin anticline), (3) that there are fuzzy horizontal bands of mineralization grading upward from hydrated iron oxides (limonite) through copper and then silver to uranium-vanadium, and (4) that the topographically and structurally high nose of the anticline is the only place where these (upper) horizontal mineralization bands have been preserved. Note the analogy with water-oil-gas zoning in a petroleum reservoir in Figure 3.

Thus it becomes apparent that the Virgin anticline is a structurally high mineralized reduction bubble in an otherwise lower aquifer (see Figure 3). Whether the hydrodynamics of the ground water flow has been significantly altered thus inhibiting mineralization by changing one or more of the necessary chemico-physical parameters for selective mineralization or whether the aquifer must first be "flushed" or affected in such a way that a chemico-physical change must occur before a reduction bubble can form are primary questions which remain unanswered. The source of the metals and of the reductants are more clearly understood. The aquifer could have been the source of the metallic elements (syngenetic in trace amounts) as well as the source of the reductant via methane evolving from the sparse carbon trash in the aquifer and driven by hydraulic pressures into structural highs together with entrained metallics. Erickson (1954) and others have demonstrated that hydrocarbons can carry small but significant amounts of metallic ions in the state which is capable of being reduced to sulphides by gaseous reductants.



CROSS SECTION
Looking North Through
HOLES 7, 8, 9 AND 10

Fig. 2

scale: 1 in. = 200 ft.

SILVER REEF AREA, WASHINGTON COUNTY, UTAH

NOSE OF FOLD PROSPECTIVE
TO 3000' ELEVATION.

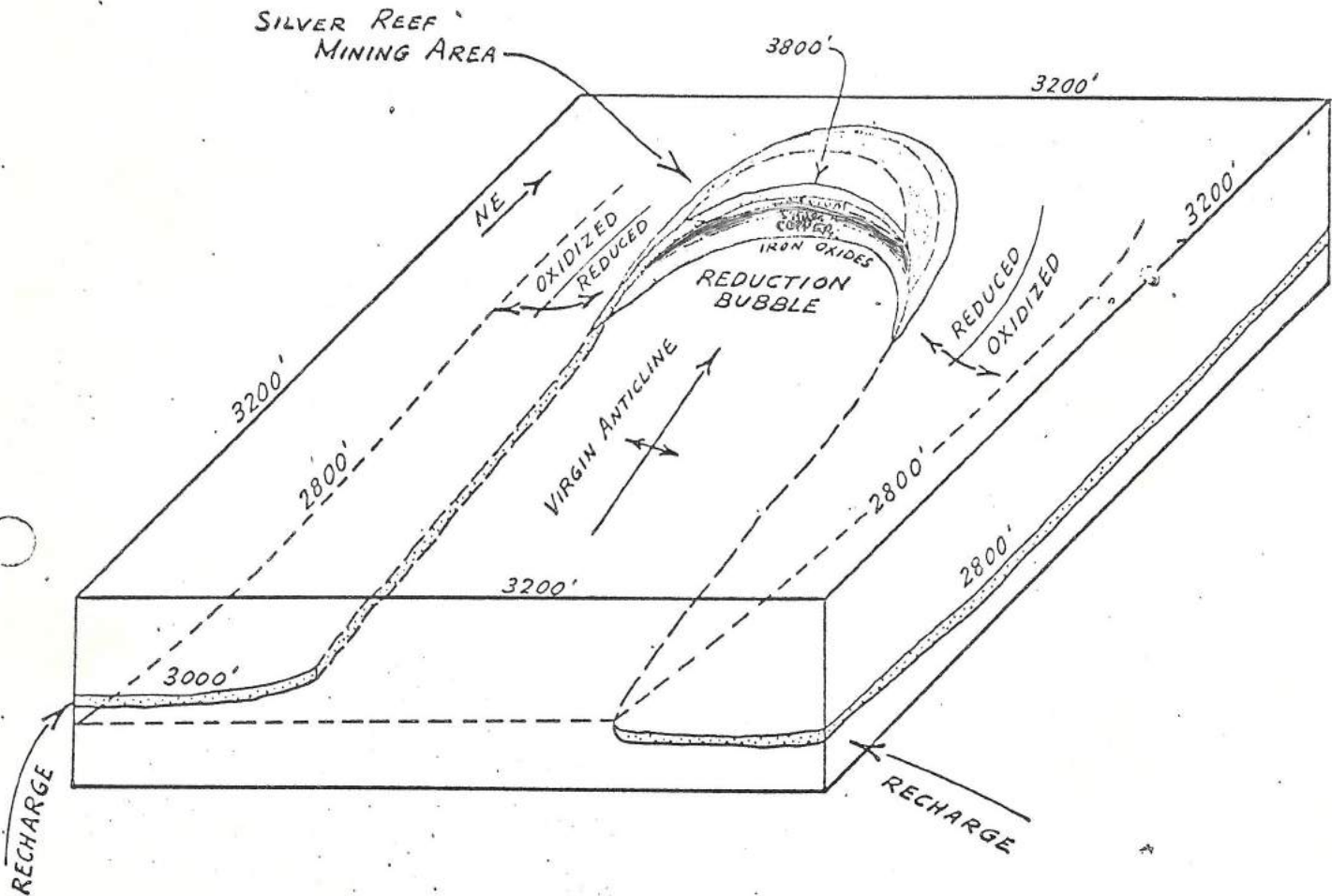


Fig. 3

INFERRED RELATIONSHIP OF MINERALIZATION
SILVER REEF AREA, WASHINGTON COUNTY, UTAH

Based on the logging and field work done, the rate of change of Eh and pH are so gradual under these circumstances as to produce only broad fuzzy mineral bands rather than abrupt dumping and high concentrations of metals over short distances, as in uranium solution fronts (see Figure 4). (Compare Figure 2 and 4) Figures 5A and 5B show in cross section some of the differences between a solution front and the proposed concept: a reduction bubble.

A new M.S. Thesis describing silver mineralizations at the Lady Belle Mine near Eagle, Colorado (Costin, 1970) has been released. This Thesis clearly indicates that here, as at Silver Reef, Utah, silver is associated with a white-bleached red bed.....the Triassic Entrada sandstone in Costin's case.

RAMIFICATIONS

In identifying the Silver Reef mineralization as being of a reduction bubble type origin, and that the Lady Belle Mine is probably similar, it becomes clear that this hypothesis might have broad applicability and tremendous economic potential.

Other areas have been considered for trying out this hypothesis: (1) Cement anticline in Oklahoma, (2) the X, Y and Z anticlines of Central Pennsylvania, (3) the Lyons formation of Northeastern Colorado, where Pan Am oil geologists made direct correlations between whitening of red beds and structural highs (see Figure 6), and (4) other areas with reported bleaching over structural highs.

FOLLOW-UP EXPLORATION

The following general exploration procedures would be most applicable:

- (1) Location of structures having minor copper and uranium mineralization.
- (2) OR Broad definition of structures having potential bleaching near structural highs.
- (3) Surface mapping in virgin areas to identify if possible Figure 2 type relationships regarding bleached (or reduced) and oxidized lithologies.

* See page 202, Water Well Technology, by Campbell & Lehn.

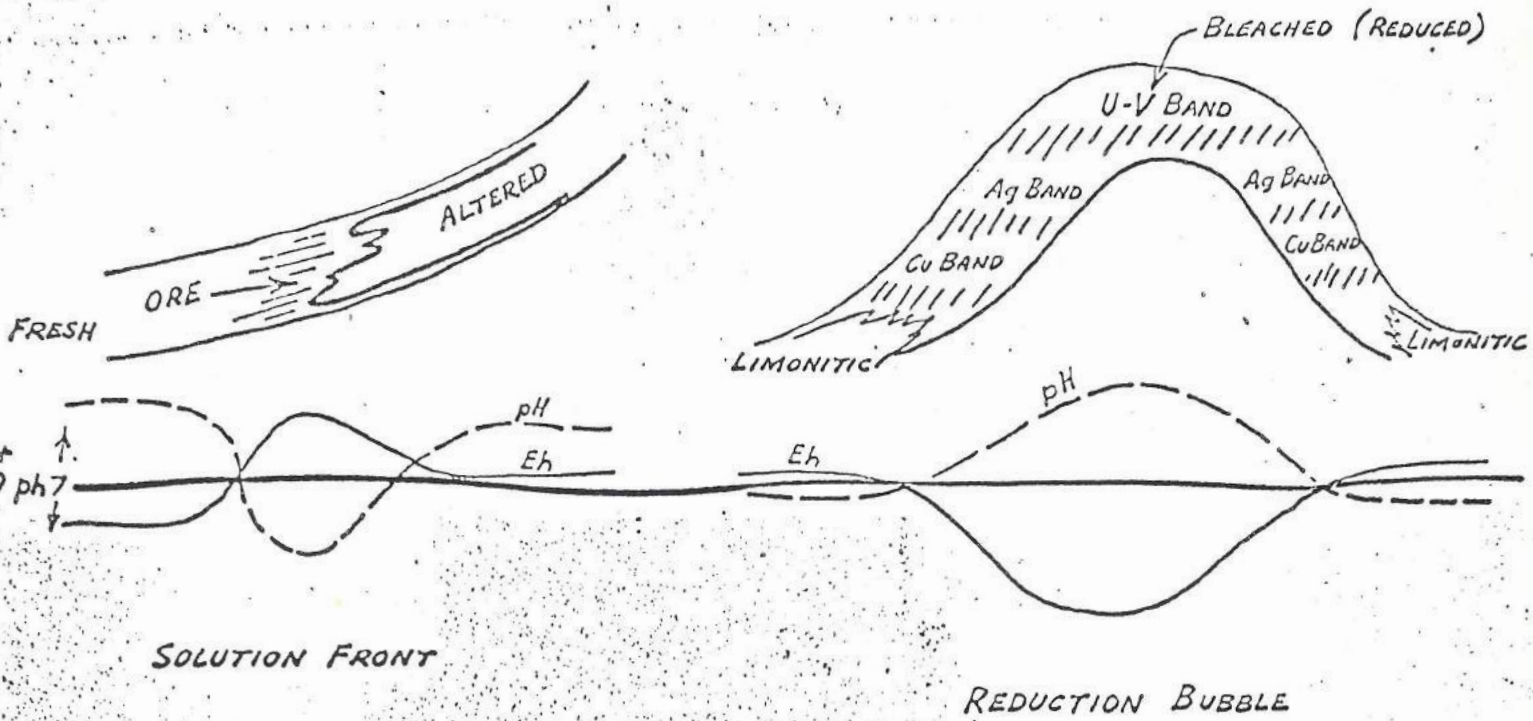


Figure 5A

Figure 5B

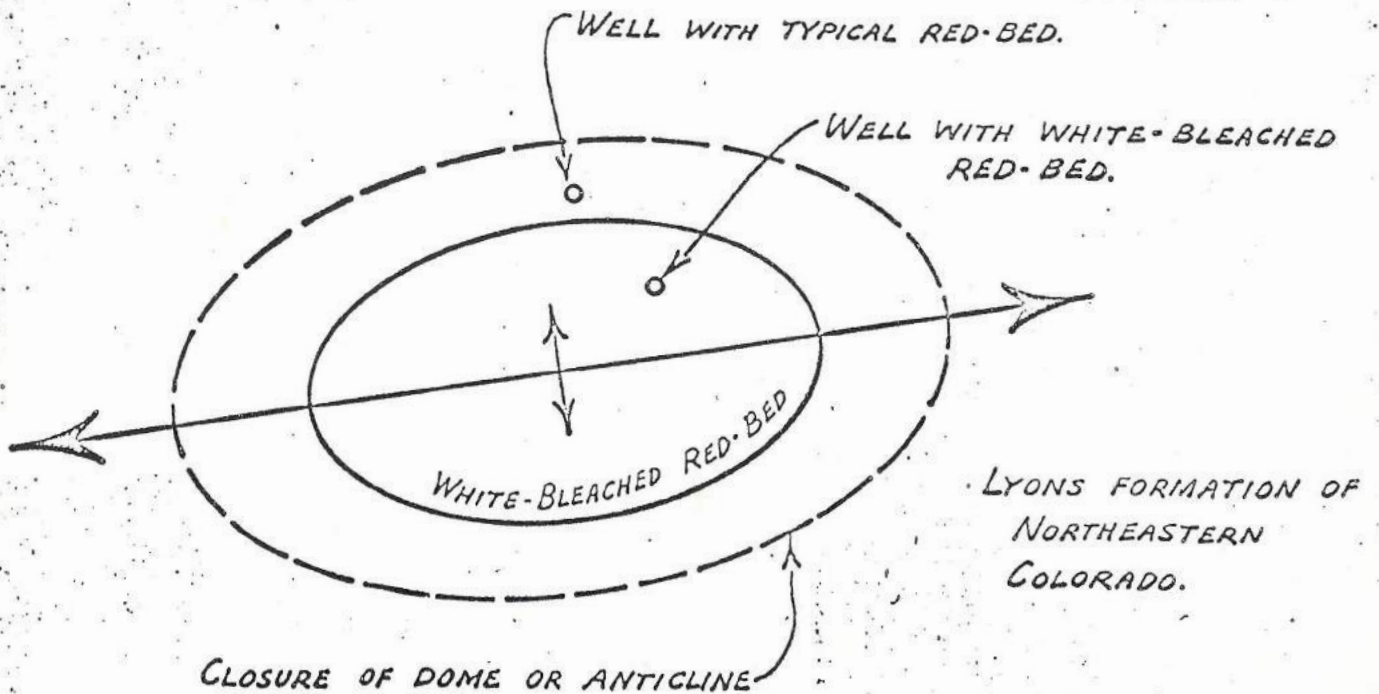


Figure 6

- (4) Exploratory drilling either to support surface mapping results or to establish relationships as expected.
- (5) Selection of suitable cuttings for assay, in ppm for Ag, Cu, U, V, Fe⁺⁺⁺, etc.
- (6) Major drilling campaign for targeting silver mineralization.

The above has been only a brief outline of the approach. For any given area of potential, additional work should be carried out which considers the specific aspects within the area.

REFERENCE

- Campbell, M. D., 1970, Preliminary Report on the Uranium-Silver Potential of Pennsylvania, 80p., May, (Unpublished United Nuclear Report)
- Costin, P. C., 1970, Geology of the Lady Belle Mine and Vicinity, Bruch Creek Mining District, Eagle County, Colorado, M.S. Thesis, Colorado School Mines.
- Erickson, R. L., 1954, Association of Uranium and other Metals with Crude Oil, Asphalt, and Petrol, Ferrous Rock, Bull. AAPG, Vol. 38, No. 10, pp 2200-2218.
- Love, T. F., G.S.A. Paper No. 20
- McKay, E. S. and Hyden, H. J., (?) Permian of North Texas and Southern Oklahoma, pp. 208-216.
- Proctor, P. D., 1953, Geology of the Silver Reef (Harrisburg) Mining District, Washington County, Utah, Utah Geol. and Min. Survey, Bull. 44.
- Rackley, R. I., 1968, Concepts and Methods of Uranium Exploration: Wy. Geol. Ass. Guidebook; Black Hills Area.

WELL LOGS FOR EXPLORATORY HOLES

NUMBER 7, 8, 9, and 10

DEPTH	STRIP LOG	LITHOLOGY LOG	ANALYSIS OR RADIOACTIVITY
20			
40			
60			
80			
100			
120			
140			
160			
180			
200			
220			
240			
260			
280			
300			
320			
340			
360			
380			
400			
420			
440			
460			
480			
500			
520			
540			
560			
580			
600			
620			
640			
660			
680			
700			
720			
740			
760			
780			
800			
820			
840			
860			
880			
900			
920			
940			
960			
980			
1000			

755-762.3

INTERBEDDED SILTSTONE, SANDSTONE, CLAYSTONE, SANDY PORTIONS PRE-
DOMINANTLY PALE REDDISH BROWN (10 R 5/4), CLAYEY PORTIONS GRAYISH RED
(10 R 4/2); FIRM; THIN, CRINKLY-BEDDED TENDENCY, SANDSTONE, MODERATELY
SORTED, SUBANGULAR TO SUBROUNDED; FINE TO MEDIUM GRAINED; QUARTZOSE;
SPARSE MEDIUM GRAY (5 Y 8/1) CALCAREOUS SPOTS IN SANDSTONE; THIN
FIBRES AND STAINING YELLOWISH GRAY CALCAREOUS SANDSTONE TOWARD BASE

762.3-763.6

SANDSTONE; YELLOWISH GRAY (5 Y 8/1); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED;
SUBANGULAR TO SUBROUNDED; QUARTZOSE; SPARSE LENSLES; LOCAL BLACK SPOTS; NEARLY
CALCAREOUS; CONTACTS ABOVE AND BELOW SUGGEST WHITISH ATRE REDDISH

763.6-783.0

SANDSTONE; PREDOMINANTLY MODERATE RED (5 R 6/4); TOP 2' HAS YELLOWISH
GRAY (5 Y 8/1) STAINING AND SPOTS AS UNIT ABOVE; CLAYEY INTERBEDS ARE
GRAYISH RED (5 R 4/1); FIRM; MOSTLY MASSIVE; SOME THIN BEDDING TOP 1/3RD; WELL
SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; LOCALY CALCAREOUS,
ESPECIALLY C. WHITE SPOTS AND LOCAL REDDISH GALLS; MICACEOUS

783.0-788.9

SANDSTONE; PALE RED PURPLE (5 RP 6/2) GRADING DOWNWARD THROUGH PALE
RED (5 R 6/2) AND A MOTTLLED INTERVAL TO YELLOWISH GRAY (5 Y 8/1); INTERBEDDED
CLAY GALLS ARE DUSKY RED (5 R 3/4) AND PALE GREEN (10 G 6/2); FIRM; THIN
BEDDED TENDENCY; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED;
QUARTZOSE; LIGHTER COLORED INTERVALS CALCAREOUS; POSSIBLE TRACES GLAUCONITE;
INTERBEDDED CLAY GALL CONGLOMERATE, POSSIBLY INCLUDING SOME ORGANIC MATERIAL

788.9-791.5

CLAYSTONE; PREDOMINANTLY GRAYISH RED (10 R 4/2); SOME MOTTLLED AND BANDED GRAYISH
GREEN (5 G 5/2); FIRM; REDDED TENDENCY; LOCALY SILTY; LOCAL FLOATING SAND GRAINS
TRACE PYRITE OXIDIZING TO LIMONITE; FRACTURES CALCAREOUS; SOME SUCROIDES

791.5-796.1

PREDOMINANTLY SANDSTONE, PALE RED (10 R 6/2) STREAKED AND BANDED YELLOWISH
GRAY (5 Y 8/1) AS UNIT 763.6-783.0; RED GREEN SILTY CLAYSTONE INTERBED

796.1-802.4

SILTSTONE; BROWNISH GRAY (5 Y 8/1); MICACEOUS; GRADING DOWNWARD TO SANDSTONE;
MOTTLED REDDISH-BROWN AND LIGHT GRAY AND DOWNWARD TO PALE RED (10 R 6/2) WITH
FAINT LIMONITE OXIDATION AT BASE; FIRM; THIN BEDDED TENDENCY; GENERALLY
WELL SORTED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; POSSIBLE TRACES GLAUCONITE

802.4-806.0

SANDSTONE; PREDOMINANTLY GRAYISH ORANGE (10 Y 7/4); SPARSE WHITISH SPOTS AND
STAINING; DARK GRAY-BROWN MOTTLED CLAYEY; FIRM; THIN-BEDDED TENDENCY
WITH SOME X-BEDDING; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED;
QUARTZOSE; TRACES LENSLES AND LOCAL BLACK ACROSSINGS; WHITISH SPOTS CALCAREOUS;
UBIQUITOUS ITINERATE PATTERNS

806.0-808.4

CLAYSTONE GRADING DOWNWARD TO SILTSTONE; UPPER PART PRED. GRAYISH RED (10 R 4/2)
AND DARK GREENISH GRAY (5 G 4/1); LOWER PART PALE GREEN (10 G 6/2); FIRM;
BEDDED TENDENCY; MICACEOUS

808.4-807.3

SANDSTONE; PREDOMINANTLY VERY LIGHT GRAY (N 8.5); TOP 4' THINLY INTERBEDDED
GRAYISH RED (10 R 4/2) AND PALE RED (10 R 6/2); OTHERWISE CLAYEY SECTIONS
GRAYISH TO GREENISH TINTED; FIRM; MASSIVE TO THIN BEDDED; WELL SORTED;
SUBANGULAR TO SUBROUNDED; MOSTLY MEDIUM GRAINED; SOME COARSE; QUARTZOSE;
SPARSE LENSLES; LOCAL LENSIFORM BLACK ACROSSINGS; NEARLY CALCAREOUS;
LOCALY CARBONACEOUS; MICACEOUS INTERBEDS; ALSO THIN GREENISH MUDSTONE
STRAININGS ... NOT MUCH EVIDENCE OF OXIDATION

807.3-812.5

SANDSTONE; VERY SIMILAR TO NEXT ABOVE, EXCEPT COLOR PRED. GRAYISH PINK (5 R 3/2)

812.5-805.6

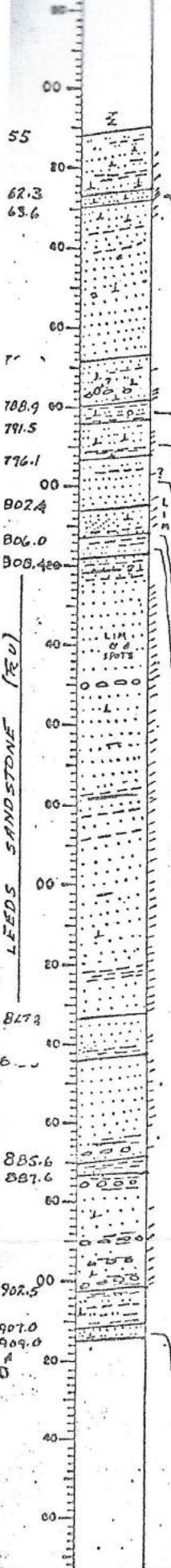
SANDSTONE; VERY LIGHT GRAY (N 8.5) AND OTHERWISE VIRTUALLY IDENTICAL
TO UNIT 2ND ABOVE ... NOTE: COALY MATERIAL IS PRESENT (UNOXYDIZED)

805.6-807.6

CLAYSTONE; BROWNISH GRAY (5 Y 8/1) GRADING DOWNWARD TO PALE BROWN (5 Y 2/2);
FIRM; MASSIVE TENDENCY; SILTY TOWARD BASE

807.6-902.5

SANDSTONE; PALE RED (10 R 6/2) GRADING DOWNWARD TO VERY LIGHT GRAY (N 8.5);
FIRM; MASSIVE, EXCEPT INTERBEDDED CLAY ...



755-762.3
INTERBEDDED SILTSTONE, SANDSTONE, CLAYSTONE, SANDY PORTIONS PRE-
DOMINANTLY PALE REDDISH BROWN (10 R 5/4); CLAYEY PORTIONS GRAYISH RED
(10 R 4/2); FIRM; THIN; CRINKLY-BEDDED TENDENCY. SANDSTONE, MODERATELY
SORTED; SUBANGULAR TO SUBROUNDED; FINE TO MEDIUM GRAINED; QUARTZOSE;
CLAYEY, YELLOWISH GRAY (5 Y 8/1) CALCAREOUS SPOTS IN SANDSTONE; THIN
FRINGS AND STRINGERS YELLOWISH GRAY CALCAREOUS SANDSTONE TOWARD BASE

762.3-763.6
SANDSTONE, YELLOWISH GRAY (5 Y 8/1); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED;
SUBANGULAR TO SUBROUNDED; QUARTZOSE; SPARSE LABILES; LOCAL BLACK SPOTS; MODERATELY
CALCAREOUS; CONTACTS ABOVE AND BELOW SUGGEST WHITISH AFTER REDDISH

763.6-783.0
SANDSTONE, PREDOMINANTLY MODERATE RED (5 R 6/4); TOP 2' HAS YELLOWISH
GRAY (5 Y 8/1) STRINGERS AND SPOTS AS UNITS ABOVE; CLAYEY INTERBEDS ARE
GRAYISH RED (5 R 4/2); FIRM, MOSTLY MASSIVE. SOME THIN BEDDING TOP 1/3 CD; WELL
SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; LOCALLY CALCAREOUS;
ESPECIALLY C. WHITE SPOTS AND LOCAL REDDISH GALLS; MICACEOUS

783.0-788.9
SANDSTONE, PALE RED PURPLE (5 RP 6/2) GRADING DOWNWARD THROUGH PALE
RED (5 R 6/2) AND A MOTTLED INTERVAL TO YELLOWISH GRAY (5 Y 8/1); INTERBEDDED
CLAY GALLS ARE DUSKY RED (5 R 3/4) AND PALE GREEN (10 G 6/2); FIRM; THIN
BEDDED TENDENCY; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED;
QUARTZOSE; LIGHTER COLORED INTERVALS CALCAREOUS; POSSIBLE TRACES CLAUCONITE;
INTERBEDDED CLAY GALL CONGLOMERATE, POSSIBLY INCLUDING SOME DEBRIS MATERIAL

788.9-791.5
CLAYSTONE, PREDOMINANTLY GRAYISH RED (10 R 4/2); SOME MOTTLED AND BANDED CLAYEY
GREEN (5 G 5/2); FIRM; BEDDED TENDENCY; LOCALLY SILTY; LOCAL FLATTING SAND GRAINS;
TRACE PYRITE OXIDIZING TO LIMONITE; FRACTURES CALCAREOUS; SOME SILICATIDES

791.5-796.1
PREDOMINANTLY SANDSTONE, PALE RED (10 R 6/2) STREATED AND BANDED YELLOWISH
GRAY (5 Y 8/1) AS UNIT 763.6-783.0; RED GREEN SILTY CLAYSTONE INTERBED

796.1-802.4
SILTSTONE; BROWNISH GRAY (5 YR 4/1); MICACEOUS; GRADING DOWNWARD TO SANDSTONE,
MOTTLED REDDISH-BROWN AND LIGHT GRAY AND DOWNWARD TO PALE RED (10 R 6/2) WITH
FAINT LIMONITE SUBSTRATE AT BASE; FIRM; THIN BEDDED TENDENCY; GENERALLY
WELL SORTED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; POSSIBLE TRACES CLAUCONITE

802.4-806.0
SANDSTONE, PREDOMINANTLY GRAYISH ORANGE (10 YR 7/4); SPARSE WHITISH SPOTS AND
STRINGERS; DARK GREY-BROWN MOTTLED CLAYEY; FIRM; THIN-BEDDED TENDENCY
WITH SOME X-BEDDING; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED;
QUARTZOSE; TRACES LABILES AND LOCAL BLACK ACESSORIES; WHITISH SPOTS (CALCAREOUS);
UBIQUITOUS ITAUMITE-PAINT

806.0-808.4
CLAYSTONE GRADING DOWNWARD TO SILTSTONE; UPPER PART RED. GRAYISH RED (10 R 4/2)
AND DARK GREENISH GRAY (5 G 4/1); LOWER PART PALE GREEN (10 G 6/2); FIRM;
BEDDED TENDENCY; MICACEOUS

808.4-867.3
SANDSTONE, PREDOMINANTLY VERY LIGHT GRAY (N 0.5); TOP 4' THINLY INTERBEDDED
GRAYISH RED (10 R 4/2) AND PALE RED (10 R 6/2); OTHERWISE CLAYEY SECTIONS
GRAYISH TO GREENISH TINTED; FIRM; MASSIVE TO THIN BEDDED; WELL SORTED;
SUBANGULAR TO SUBROUNDED; MOSTLY MEDIUM GRAINED; SOME COARSE; QUARTZOSE;
SPARSE LABILES; LOCAL CONSPICUOUS BLACK ACESSORIES; NEARLY CALCAREOUS
LOCALLY; CARBONACEOUS; MICACEOUS INTERBEDS. ALSO THIN GREENISH MUDSTONE
STRINGERS ... NOT MUCH EVIDENCE OF OXIDATION

867.3-872.5
SANDSTONE, VERY SIMILAR TO NEXT ABOVE, EXCEPT COLOR PRED. GRAYISH PINK (5 R 9/2)

872.5-885.6
SANDSTONE, VERY LIGHT GRAY (N 0.5) AND OTHERWISE VIRTUALLY IDENTICAL
TO UNIT 2ND ABOVE. ... NOTE: LOCALY MARSHAL IS MITHIN (UNOXIDIZED)

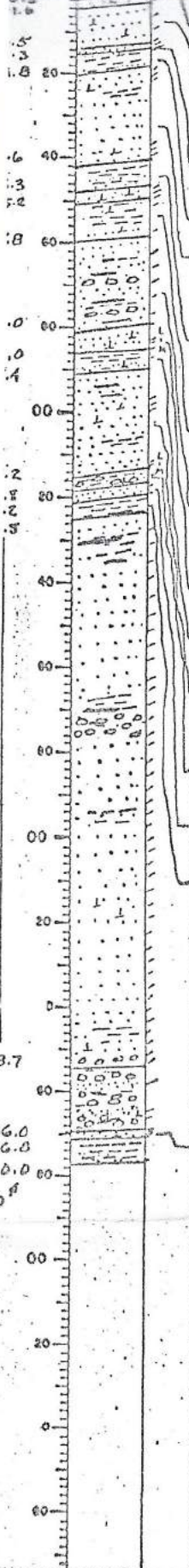
885.6-887.6
CLAYSTONE, BROWNISH GRAY (5 YR 4/1) GRADING DOWNWARD TO PALE BROWN (5 YR 5/2);
FIRM; MASSIVE TENDENCY; SILTY TOWARD BASE

887.6-902.5
SANDSTONE, PALE RED (10 R 6/2) GRADING DOWNWARD TO VERY LIGHT GRAY (N 0.5);
FIRM; MASSIVE, EXCEPT INTERBEDDED CLAY-GALL CONGLOMERATE; WELL SORTED
OTHERWISE; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE;
WEAK TITACES. Ca CO₃

902.5-907.0
CLAYSTONE, PREDOMINANTLY DARK GREENISH GRAY (5 G 4/1) AND LIGHT OLIVE
GRAY (5 Y 6/1) WITH INFUX OF GRAYISH RED (5 R 4/2) TOWARD BASE; FIRM;
BEDDED TENDENCY; VERY SILTY; LOCALLY CALCAREOUS

907.0-909.0
SANDSTONE AND SILTSTONE, PALE RED (5 R 6/2); FIRM; MASSIVE TENDENCY;
WELL SORTED; FINE GRAINED; QUARTZOSE, VERY MODERATELY CALCAREOUS

DEPTH	STRIP LOG	LITHOLOGY LOG	ANALYSIS OR RADIOACTIVITY
0.0		830.0 - 838.0 SILTSTONE; GRAYISH-RED (10 R 4/2); FIRM; MASSIVE TENDENCY; CLAYST; MICACEOUS	
3.0		838.0 - 848.0 INTERBEDDED SILTSTONE, SANDSTONE, CLAYSTONE. OVERALL COLOR PALE REDDISH BROWN (10 R 5/4); CLAYEY BANDS DARKER; FIRM; THIN- CRINKLY-BEDDED TENDENCY; SANDY PORTIONS MODERATELY WELL SORTED AND QUARTZOSE; IRREGULAR WHITISH SPOTS AND BANDS ARE CALCAREOUS	
18.0		848.0 - 848.8 CLAYSTONE; GRAYISH RED (10 R 4/2); FIRM; MASSIVE TENDENCY; SILTY; MICACEOUS	
20.0		848.8 - 850.3 INTERBEDDED SILTSTONE, SANDSTONE, AND CLAYSTONE; VIRTUALLY IDENTICAL TO UNIT 2ND ABOVE	
51.6		850.3 - 851.6 SANDSTONE; PINNISH GRAY (5 YR 8/1); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED QUARTZOSE; SPARSE EXOTICS; CALCAREOUS. WHITE NEAR BED	
52.5		851.6 - 856.5 SANDSTONE, PREDOMINANTLY PALE REDDISH BROWN (10 R 5/4) BUT WITH WHITISH SPOTS AND BANDS AS SANDSTONE NEXT ABOVE; FIRM; MASSIVE TENDENCY; WELL SORTED; MOSTLY MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; WHITISH AREAS GENERALLY CALCAREOUS; EMBAYMENTS OF OLIVE SHOW SOME AFTER RED	
7.3		856.5 - 857.3 SANDSTONE; PINNISH GRAY (5 YR 8/1); FIRM; MASSIVE. OTHERWISE SIMILAR TO UNIT 2ND ABOVE, EXCEPT NON CALCAREOUS; FAINT PINK SUGGESTS "RED BED"	
9.8		857.3 - 857.8 CLAYSTONE; GREENISH RED (10 R 4/2); FIRM; SILTY TO SANDY; MICACEOUS	
20		857.8 - 870.6 SANDSTONE, TOP AND BOTTOM 2' VERY LIGHT GRAY (N 8); MIDDLE PART PALE REDDISH BROWN; FIRM; MOSTLY MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; GREENISH GLAUCONITE?; NEARLY CALCAREOUS IN WHITE AREAS; COLOR CHANGES HERE GRADUALLY	
3.6		870.6 - 873.3 CLAYSTONE; PILED GRAYISH RED PURPLE (5 RP 4/2); SOME REDDER; FIRM; BEDDED TENDENCY; SILTY; MICACEOUS	
3.3		873.3 - 875.2 SANDSTONE; GRAYISH-ORANGE-PINK (10 R 8/2); CALCAREOUS; OTHERWISE AS 850.3-851.6	
5.2		875.2 - 877.8 CLAYSTONE, UPPER AND LOWER PARTS REDDISH WITH WHITISH SPOTS AND BANDS, AS UNIT 851.6-856.5; MEDIAL PART OLIVE GRAY (5 Y 6/1) AND LIGHT OLIVE GRAY (5 Y 6/1); SILTY; WHITISH AREAS GENERALLY WEAKLY CALCAREOUS	
7.8		877.8 - 890.0 SANDSTONE, PREDOMINANTLY LIGHT GRAY (N 7); DRETTOR WHERE STREATER WITH CARBON OR CLAY; FIRM; THIN BEDDED; WELL SORTED; MOSTLY MEDIUM GRAINED, SOME COARSE; SUBROUNDED TO SUBANGULAR; QUARTZOSE; CARBON- ACEOUS AND GREENISH CLAY STRINGS... DEFINITELY NOT OXIDIZED	
7.0		890.0 - 895.0 (OUT OF ORDER?) SANDSTONE; TOP 2' PALE RED (10 R 6/2); BOTTOM 1' GRAYISH ORANGE (10 YR 7/4); FIRM; MASSIVE TENDENCY; OTHER PARAMETERS AS ABOVE; CALCAREOUS-LIMONITE	
1.0		895.0 - 895.4 CLAYSTONE GRADING DOWNWARD TO SILTSTONE; PREDOMINANTLY DARK GREENISH GRAY (5 GY 5/1); LOCAL SPARSE LIMONITE STAIN; FIRM; BEDDED TENDENCY; LOCAL CALC	
1.0		895.4 - 907.2 SANDSTONE; TOP 4' LIGHT BROWNISH GRAY (5 YR 6/1); NEXT 1'5' VERY LT. GRAY (N 8); THIS GIVES WAY GRADUALLY TO PALE RED (10 R 5.5/3); BOTTOM 2" GRAYISH ORANGE (10 YR 7/4); FIRM; BEDDED TO MASSIVE; OTHERWISE AS ABOVE; TOP 4' CALC.; WHITE-CALCAREOUS	
1.4		907.2 - 908.8 CLAYSTONE AND CLAY-GALL CONGLOMERATE; MEDIUM DARK GRAY (N 4) TO MEDIUM GRAY (N 7); LOCAL LIMONITE (INDIGENOUS?); FIRM; CONSPICUOUS BEDDING; SLIGHTLY CALC.	
1.2		908.8 - 910.2 (NOTE "WHITE" TOP (BOTTOM NEXT AND ABOVE)) SANDSTONE, GRADING DOWNWARD FROM GRAYISH ORANGE PINK (10 R 8/2) THROUGH PALE RED (10 R 6/2) TO VERY LIGHT GRAY (N 8); OTHERWISE AS ABOVE; WHITE CALCAREOUS	
1.2		910.2 - 912.5 (NOTE "REDUCTION" AT TOP OF WHITE SAND) CLAYSTONE; GRAYISH RED GRADING (VARIATED) DOWNWARD TO PALE GREEN (10 G 6/2)	
1.5		912.5 - 978.7 SANDSTONE, PREDOMINANTLY VERY LIGHT GRAY (N 8 TO N 8.5); LOCALLY SOME WHIT DRETTOR WHERE CLAYEY OR CARBONACEOUS; FIRM; MASSIVE TO THIN- BEDDED; WELL SORTED; MEDIUM GRAINED; QUARTZOSE WITH SPARSE EXOTICS; TRACES CALC; TOWARD BASE, CARBONACEOUS AND CLAYEY AS INDICATED... NOTE - ALL CLAY, INCL. BASAL GALLS ARE GREENISH OR GRAYISH (COLORED)	
3.7		978.7 - 986.0 CLAY-GALL CONGLOMERATE; UPPER PART PREDOMINANTLY GRAYISH RED (10 R 4/2) BECOMING VARIATED GREENISH TOWARD BASE; MATRIX IS WHITISH SANDSTONE AND CONGLOMERATE; LOCALLY CALCAREOUS TOWARD BASE	
6.0		986.0 - 986.8 SANDSTONE; VERY LIGHT GRAY (N 8); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; CALCAREOUS	



INTERBEDDED SILTSTONE, SANDSTONE, AND CLAYSTONE; VIRTUALLY IDENTICAL TO UNIT 2 AND ABOVE
 B50.7-051.4 SANDSTONE, PINKISH GRAY (5YR 6/1); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; SPARSE EXOTICS; CALCAREOUS - WHITE NEAR RED
 B51.6-056.5 SANDSTONE, PREDOMINANTLY PALE REDDISH BROWN (10R 5/4) BUT WITH WHITISH SPOTS AND BANDS AS SANDSTONE NEXT ABOVE; FIRM; MASSIVE TENDENCY; WELL SORTED; MOSTLY MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; WHITISH AREAS - GENERALLY - CALCAREOUS; EMBAYMENTS OF PALE SAND WHICH APPEAR RED
 B56.5-057.3 SANDSTONE, PINKISH GRAY (5YR 6/1); FIRM; MASSIVE - OTHERWISE SIMILAR TO UNIT 2 AND ABOVE, EXCEPT NON-CALCAREOUS; FAINT PINK SUGGESTS 'RED BED'
 B57.3-059.8 CLAYSTONE; GREENISH RED (10R 4/2); FIRM; SILTY TO SANDY; MICACEOUS
 B59.8-070.4 SANDSTONE, TOP AND BOTTOM 2' VERY LIGHT GRAY (N 8); MIDDLE PART PALE REDDISH BROWN; FIRM; MOSTLY MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; GREENISH GLAUCONITE?; NEARLY CALCAREOUS IN WHITE AREAS; COLOR CHANGES ARE GRADUAL
 B70.6-073.3 CLAYSTONE, PRED. GRAYISH RED PURPLE (5RP 4/2); SOME REDDER; FIRM; BEDDED TENDENCY; SILTY; MICACEOUS
 B73.3-075.2 SANDSTONE, GRAYISH-ORANGE-PINK (10R 5/2); CALCAREOUS; OTHERWISE AS B50.7-051.4
 B75.2-079.8 CLAYSTONE, UPPER AND LOWER PARTS REDDISH WITH WHITISH SPOTS AND BANDS, AS UNIT B51.6-B56.5; MEDIAL PART OLIVE GRAY (5Y 4/1) AND LIGHT OLIVE GRAY (5Y 6/1); SILTY; WHITISH AREAS GENERALLY WEAKLY CALCAREOUS
 B79.8-090.0 SANDSTONE, PREDOMINANTLY LIGHT GRAY (N 7); DRAPEL WHOSE STRENGTH WITH CARBON OR CLAY; FIRM; THIN BEDDED; WELL SORTED; MOSTLY MEDIUM GRAINED, SOME COARSE; SUBROUNDED TO SUBANGULAR; QUARTZOSE; CARBONACEOUS AND GREENISH CLAY STRINGERS... DEFINITELY NOT OXIDIZED
 B90.0-093.0 (NOT ON ORDER) SANDSTONE; TOP 2' PALE RED (10R 6/2); BOTTOM 1' GRAYISH ORANGE (10YR 7/4); FIRM; MASSIVE TENDENCY; OTHER PARAMETERS AS ABOVE; CALCAREOUS - LIMONITIC
 B93.0-095.4 CLAYSTONE, GRADING DOWNWARD TO SILTSTONE; PREDOMINANTLY DARK GREENISH GRAY (5GY 5/1); LOCAL SPARSE LIMONITE SPAIN; FIRM; BEDDED TENDENCY; LOCAL CALC
 B93.0-097.2 SANDSTONE; TOP 4' LIGHT BROWNISH GRAY (5Y 6/1); NEXT 1'2' VERY LT. GRAY (N 8); THIS GIVES WAY GRADUALLY TO PALE RED (10R 5.5/3); BOTTOM 2" GRAYISH ORANGE (10YR 7/4); FIRM; BEDDED TO MASSIVE; OTHERWISE AS ABOVE; TOP 4' CALC.; WHITE-CALCAREOUS
 907.2-908.8 CLAYSTONE AND CLAY-GALL CONGLOMERATE; MEDIUM DARK GRAY (N 4) TO MEDIUM GRAY (N 7); LOCAL LIMONITE (INDIGENOUS?); FIRM; CONSPICUOUS BEDDING; SLIGHTLY CALC.
 908.8-910.2 (NOTE "WHITE" TOP {BOTTOM HERE AND ABOVE}) SANDSTONE; GRADING DOWNWARD FROM GRAYISH ORANGE PINK (10R 8/2) THROUGH PALE RED (10R 6/2) TO VERY LIGHT GRAY (N 8); OTHERWISE AS ABOVE; WHITE-CALCAREOUS
 910.2-912.5 (NOTE "REDUCION" AT TOP OR WHITE SAND) CLAYSTONE; GRAYISH RED GRADING (VARIEGATED) DOWNWARD TO PALE GREEN 10G 6/2
 912.5-978.7 SANDSTONE, PREDOMINANTLY VERY LIGHT GRAY (N 8 TO N 8.5); LOCALLY SOME WHAT DARKER WHITE CLAYEY OR CARBONACEOUS; FIRM; MASSIVE TO THIN-BEDDED; WELL SORTED; MEDIUM GRAINED; QUARTZOSE WITH SPARSE EXOTICS; TRACES CALC. TOWARD BASE; CARBONACEOUS AND CLAYEY AS INDICATED... NOTE - ALL CLAY, INCL. BASAL GALLS ARE GREENISH OR GRAYISH (REDUCED)
 978.7-986.0 CLAYGALL CONGLOMERATE; UPPER PART PREDOMINANTLY GRAYISH RED (10R 4/2) BECOMING VARIEGATED GREENISH TOWARD BASE; MATRIX IS WHITISH SANDSTONE AND CONGLOMERATE; LOCALLY CALCAREOUS TOWARD BASE
 986.0-986.8 SANDSTONE; VERY LIGHT GRAY (N 8); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; CALCAREOUS
 986.8-990.0 CLAYSTONE; MEDIUM GREENISH GRAY (5G 5/1) TO LIGHT OLIVE GRAY (5Y 6/1); FIRM; BEDDED TENDENCY; SILTY

DEPTH	STRIP LOG	LITHOLOGY LOG	ANALYSIS OR RADIOACTIVITY
0		1255.0 - 1261.1 INTERBEDDED SILTSTONE, SANDSTONE AND CLAYSTONE; OVERALL COLOR PALE REDDISH, BROWN (10R 5/4); CLAYEY SECTIONS DARKER; FIRM; THIN-, CRINALLY BEDDED; SANDY INTERVALS QUARTZOSE; IRREGULAR WHITE SPOTS, CALCAREOUS	
0		1261.1 - 1262.2 SANDSTONE, YELLOWISH GRAY (5Y 8/1); FIRM, MASSIVE, WELL SORTED; MEDIUM GRAINED. SUBANGULAR TO SUBROUNDED; QUARTZOSE WITH SPARSE STYOLITES; CALCAREOUS; WHITE AFTER RED	
0		1262.2 - 1264.0 INTERBEDDED SILTSTONE, SANDSTONE, AND CLAYSTONE, AS UNIT 2ND ABOVE	
0		1264.0 - 1270.4 (NOTE REDUCTION OF CLAYEY STRINGERS) SANDSTONE; PREDOMINANTLY PALE RED (5R 6/4), BUT DUSKY RED (5R 5/4) IN CLAY- GALL CONGLOMERATE SECTION AND LOCALLY BLEACHED GRAYISH ORANGE PINK (10R 8/2); FIRM; MASSIVE TO THIN BEDDED; GENERALLY BLEACHED AREAS ARE CALCAREOUS SUBANGULAR TO SUBROUNDED, QUARTZOSE; BLEACHED AREAS ARE CALCAREOUS AND CLAYEY STRINGERS ARE REDUCED TO GREENISH CONES, TRACES LIMONITE PAINT	
0		1270.4 - 1271.4 SILTSTONE; GRAYISH RED (5R 4/2); FIRM; MASSIVE; CLAYEY; MICACEOUS	
0		1271.4 - 1272.4 SANDSTONE; PALE RED (5R 6/4) STREAKED AND SPOTTED PINKISH GRAY (5Y 6/1); LIGHTER AREAS CALCAREOUS; OTHERWISE SIMILAR TO UNIT 1264.0 - 1270.4	
0		1272.4 - 1274.0 (NOTE REDUCTION OF CLAYEY STRINGERS) SILTSTONE, GRAYISH RED (5R 4/2) WITH MEDIAL SANDY INTERBED PINKISH GRAY (5Y 6/1); OTHER CHARACTERISTICS AS ABOVE; LIGHTER SANDY AREAS CALCAREOUS WITH GREENISH CLAY	
0		1274.0 - 1279.6 (NOTE ALTERNATION AT TOP AND BOTTOM OF SANDY UNIT) SANDSTONE; PREDOMINANTLY PALE RED (5R 6/4) BUT VERY LT. GRAY (N 6) TOP 2" AND BOTTOM 12"; FIRM; SIMILAR TO COUNTERPART ABOVE; WHITTY CLAY INTERBEDS ARE REDUCED TO GREENISH IN BLEACHED AREAS	
0		1279.6 - 1287.0 (NOTE REDUCTION FEATURES) CLAYSTONE AND SILTSTONE, VARIATED GRAYISH RED (5R 4/2) AND DARK GREENISH GRAY (5Y 6/1); SILTY SECTIONS LIGHT OLIVE GRAY (5Y 6/1); MEDIAL SANDSTONE IS VERY PALE ORANGE (10YR 8/2); ALL FIRM; BEDDED TENDENCY; ALL SIMILAR TO COUNTERPARTS; BLEACHED SANDSTONE IS CALCAREOUS WITH GREENISH CLAY STRINGERS; ALSO TOP OF THIS UNIT IS GREENISH BENEATH BLEACHED SAND ABOVE	
0		1287.0 - 1301.6 SILTSTONE GRADING DOWNWARD TO SANDSTONE; TOP 2.5' MOTTLED GRAYISH RED (5R 4/2), YELLOWISH GRAY (5Y 6/1) AND MODERATE YELLOW (5Y 7/6); REMAINDER MOSTLY PALE RED (5R 6/2) MOTTLED LIGHTER AND LIGHTENING DOWNWARD TO GRAYISH PINK (5R 6/2); TOWARD BASE; FIRM; MASSIVE ABOVE; THIN-BEDDED BELOW; WELL SORTED; MEDIUM GRAINED; QUARTZOSE; CLAYEY AND CALCAREOUS AS INDICATED; NOTE LIMONITE PAINT	
0		1301.6 - 1303.0 CLAYSTONE; MOSTLY MEDIUM GRAY (N 5); SILTY SECTIONS LIGHT OLIVE GRAY (5Y 6/1); FIRM; THIN-BEDDED; CLAY GALLS AT TOP; LIMY FRACTURES; BASE IS DIPPING GREENISH	
0		1303.0 - 1312.0 SANDSTONE; GRAYISH PINK (5R 7/2) GRADING DOWNWARD TO PALE RED (5R 6/2) MOTTLED YELLOWISH GRAY (5Y 6/1); LOCALLY IN LOWER PART; FIRM; THIN BEDDED; QUARTZOSE, CLAYEY, CALCAREOUS, CHROMACEOUS AS INDICATED	
0		1312.0 - 1312.5 SILTSTONE; GREENISH GRAY (5Y 6/1); FIRM; VERY CLAYEY	
0		1312.5 - 1383.2 NOTE: SO-CALLED "LIMONITE" MAY BE JAROSITE, ETC. SANDSTONE; VERY LIGHT GRAY (N 6) TO LIGHT GRAY (N 7) TOP 20'; PALE RED (10R 6/2) NEXT 17'; VERY LIGHT GRAY (N 8) TO YELLOWISH GRAY (5Y 7/2) NEXT 12'; BASAL PART GRAYISH PINK (5R 7/2) TO VERY PALE ORANGE (10YR 8/2); YELLOWISH AND ORANGISH COLORS ARE LIMONITE "OVERSTAINING OR PAINT"; FIRM; THIN BEDDED TO MASSIVE; GENERALLY WELL SORTED; MOSTLY MEDIUM GRAINED; LOCAL CLAY-GALL CONGLOMERATE; QUARTZOSE; SPARSE STYOLITES; LOCAL CONSPICUOUS BLACK ACCESSORIES; LOCAL SPARSE IRON OXIDE SPOTS (AROUND CLAY GALLS?); MORE CALCAREOUS THAN UP-DIP, ESP. WHITISH LIMY SPOTS TOWARD BASE; PRESUMABLY CARBONACEOUS AS INDICATED; NOT SO MUCH EVIDENCE OF "REDUCTION" ALONG MARGINS AND INTERNALLY	
0		1383.2 - 1385.2 CLAYGALL CONGLOMERATE; ESSENTIALLY GRAYISH RED (5R 4/2). GIVING WAY DOWNWARD TO OLIVE GRAY (5Y 4/1); LOCALLY CALCAREOUS	
0		1385.2 - 1394.4 SANDSTONE; TOP 1/2' GRAYISH RED (5R 4/2) WITH LIGHT STREAKS; REMAINDER	

1255.0 - 1261.1
 INTERBEDDED SILTSTONE, SANDSTONE, AND CLAYSTONE; OVERALL COLOR PALE REDDISH BROWN (10R 5/4); CLAYEY SECTIONS DARKER; FIRM; THIN-BEDDED; SANDY INTERVALS QUARTZOSE; IRREGULAR WHITE SPOTS CALCREOUS.

1261.1 - 1262.2
 SANDSTONE; YELLOWISH GRAY (5Y 6/1); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE WITH SPARSE EXOTICS; CALCREOUS; WHITE AFTER CO.

1262.2 - 1264.0
 INTERBEDDED SILTSTONE, SANDSTONE, AND CLAYSTONE, AS UNIT 2ND ABOVE

1264.0 - 1270.4 (NOTE REDUCTION AT CLAYEY STRIPES)
 SANDSTONE; PREDOMINANTLY PALE RED (5R 6/4) BUT DUSKY RED (5R 5/4) IN CLAY-CELL CONGLOMERATE SECTION AND LOCALLY BLEACHED GRAYISH ORANGE PINK (10R 8/2); FIRM; MASSIVE TO THIN BEDDED; GENERALLY WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; BLEACHED AREAS ARE CALCREOUS AND CLAYEY STRIPES ARE REDUCED TO GREENISH-GRAY; TRACES LIMONITE PAINT

1270.4 - 1271.4
 SILTSTONE; GRAYISH RED (5R 4/2); FIRM; MASSIVE; CLAYEY; MICACEOUS

1271.4 - 1272.4
 SANDSTONE; PALE RED (5R 6/2) STREAKED AND SPOTTED PINKISH GRAY (5Y 6/1); LIGHTER AREAS CALCREOUS; OTHERWISE SIMILAR TO UNIT 1264.0 - 1270.4

1272.4 - 1274.0 (NOTE REDUCTION OF CLAYEY STRIPES)
 SILTSTONE; GRAYISH RED (5R 4/2) WITH MEDIAL SANDY INTERBED PINKISH GRAY (5Y 6/1); OTHER CHARACTERISTICS AS ABOVE; LIGHTER SANDY AREAS CALCREOUS WITH GREENISH CLAY

1274.0 - 1279.6 (NOTE ALTERNATION AT TOP AND BOTTOM OF SANDY UNIT)
 SANDSTONE; PREDOMINANTLY PALE RED (5R 6/4) BUT VERY LT. GRAY (N 8) TOP 2" AND BOTTOM 12"; FIRM; SIMILAR TO COUNTERPART ABOVE; WHIPPY CLAY INTERBEDS ARE REDUCED TO GREENISH IN BLEACHED AREAS

1279.6 - 1287.0 (NOTE REDUCTION FEATURES)
 CLAYSTONE AND SILTSTONE; VARIATED GRAYISH RED (5R 4/2) AND DARK GREENISH GRAY (5G 4/1); SILTY SECTIONS LIGHT OLIVE GRAY (5Y 6/1); MEDIAL SANDSTONE IS VERY PALE ORANGE (10YR 8/2); ALL FIRM; BEDDED TENDENCY; ALL SIMILAR TO COUNTERPART; BLEACHED SANDSTONE IS CALCREOUS WITH GREENISH CLAY STRIPES; ALSO TOP OF THIS UNIT IS GREENISH BENEATH BLEACHED SAND ABOVE

1287.0 - 1301.6
 SILTSTONE GRADING DOWNWARD TO SANDSTONE; TOP 2.5' MOTTLED GRAYISH RED (5R 4/2) YELLOWISH GRAY (5Y 6/1) AND MODERATE YELLOW (5Y 7/6); REMAINDER MOSTLY PALE RED (5R 6/2) MOTTLED LIGHTER AND LIGHTENING DOWNWARD TO GRAYISH PINK (5R 6/2) TOWARD BASE; FIRM; MASSIVE ABOVE; THIN-BEDDED BELOW; WELL SORTED; MEDIUM GRAINED; QUARTZOSE; CLAYEY AND CALCREOUS AS INDICATED; NOTE LIMONITE PAINT

1301.6 - 1303.0
 CLAYSTONE; MOSTLY MEDIUM GRAY (N 5); SILTY SECTIONS LIGHT OLIVE GRAY (5Y 6/1); FIRM; THIN-BEDDED; CLAY GALLS AT TOP; LIMY FRACTURES; BASE IS DISTANT GREENISH

1303.0 - 1312.0
 SANDSTONE; GRAYISH PINK (5R 7/2) GRADING DOWNWARD TO PALE RED (5R 6/2) MOTTLED YELLOWISH GRAY (5Y 6/1); LOCALLY IN LOWER PART; FIRM; THIN BEDDED; QUARTZOSE; CLAYEY; CALCREOUS; AREWACEOUS AS INDICATED

1312.0 - 1312.5
 SILTSTONE; GREENISH GRAY (5Y 6/1); FIRM; VERY CLAYEY

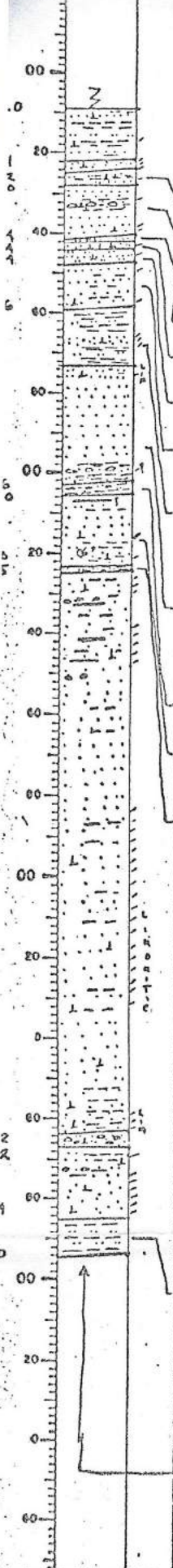
1312.5 - 1333.2 NOTE: SO-CALLED "LIMONITE" MAY BE JAROSIN, ETC.
 SANDSTONE; VERY LIGHT GRAY (N 8) TO LIGHT GRAY (N 7) TOP 20'; PALE RED (10R 6/2) NEXT 17'; VERY LIGHT GRAY (N 8) TO YELLOWISH GRAY (5Y 7/2) NEXT 12'; BASIC PART GRAYISH PINK (5R 7/2) TO VERY PALE ORANGE (10YR 8/2); YELLOWISH AND ORANGISH CLAYS ARE LIMONITE "OVERSTONES OR PAINT"; FIRM; THIN BEDDED TO MASSIVE; GENERALLY WELL SORTED; MOSTLY MEDIUM GRAINED; LOCAL "CLAY-GALL" CONGLOMERATE; QUARTZOSE; SPARSE EXOTICS; LOCAL CONSPICUOUS BLACK ACCESSORIES; LOCAL SPARSE IRON OXIDE SPOTS (AROUND CLAY GALLS?); MORE CALCREOUS THAN UP-DIP, ESR. WHITISH LIMY SPOTS TOWARD BASE; PRESUMABLY CARBONACEOUS AS INDICATED; NOT SO MUCH EVIDENCE OF "REDUCTION" ALONG MARGINS AND INTERNALLY

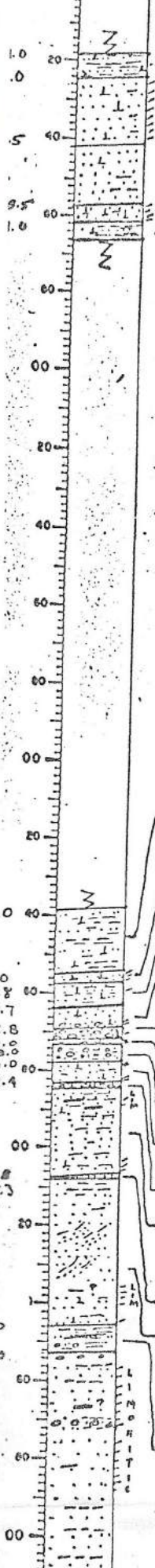
1333.2 - 1335.2
 CLAYCELL CONGLOMERATE; ESSENTIALLY GRAYISH RED (5R 4/2) GIVING WAY DOWNWARD TO OLIVE GRAY (5Y 4/1); LOCALLY CALCREOUS

1335.2 - 1344.4
 SANDSTONE; TOP 1/3RD GRAYISH RED (5R 4/2) WITH LIGHTER STRIAT; REMAINDER YELLOWISH GRAY (5Y 6/1) TO VERY PALE ORANGE (10YR 8/2); FIRM; TOP 1/3RD THIN BEDDED; REMAINDER MASSIVE; QUARTZOSE; WELL SORTED; MEDIUM GRAINED; BLEACHED PARTS NOTICEABLY CALCREOUS; CLAYEY ABOVE; ONLY FAINT REDUCTION AROUND MARGINS AND INTERNALLY

1344.4 - 1399.0
 CLAYSTONE AND SILTSTONE; PREDOMINANTLY GRAYISH RED (5R 4/2) LOCALLY VARIATED GREENISH GRAY (5Y 6/1); SILTY PORTIONS LIGHT OLIVE GRAY (5Y 6/1); FIRM; MASSIVE TO BEDDED; NOTE UNLESS LOCAL J.M. MOTTLED, CLAYSTONE IS REDDISH RATHER THAN GREENISH BENEATH BLEACHED SANDSTONE NEXT ABOVE

NOTE: LATER FOUND ANOTHER BOX WITH '2' CASE SIMILAR TO UNIT LAST DESCRIBED





1209.0 - 1212.0
 INTERBEDDED SILTSTONE, SANDSTONE, CLAYSTONE; ESSENTIALLY GRAYISH RED (SR 4/2) WITH RANDOM WHITISH SPOTS; FIRM; TENDENCY TOWARD CRINKLY BEDDING; CLAYEY, QUARTZOSE; ALL CALCAREOUS, ESP. WHITE SPOTS

1212.0 - 1220.5 (NOTE REDUCED MARGINS AND INTERIOR)
 SANDSTONE; GRAYISH-ORANGE PINK (10R 8/2); FIRM; MASSIVE TENDENCY; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; CALCAREOUS, ESP. UPPER PART; LOCAL BLACK SPOTS; WHISPER GREENISH CLAYSTONE

1220.5 - 1228.5
 SANDSTONE; PALE ORANGISH (10R 6/5); CLAYEY AND RR. TYPE GRADE FROM ABOVE; FIRM; MASSIVE TENDENCY; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; TRACE CaCO₃; TOWARD TOP

1228.5 - 1231.0
 SANDSTONE; VERY LT. GRAY (N 6.5); VERY CALCAREOUS; OTHERWISE AS 1212.0 - 220.5

1231.0 - 1233.0
 CLAYSTONE AND SILTSTONE; MOISTY DUSKY RED (SR 5/4) VARIEGATED AND BANDED LIGHT OLIVE GRAY (5Y 6/1); FIRM; THIN-BEDDED TENDENCY; SOME INTERBEDS STRONGLY CALCAREOUS

NOTE: ABOVE AND IN OTHER CORES BLEACHING AT TOP AND BOTTOM OF AQUIFER

NOTE: INTERVAL NOT LOGGED IS ALL SIMILAR TO UNITS NEXT ABOVE AND BELOW

1320.0 - 1328.0
 INTERBEDDED SILTSTONE, SANDSTONE, AND CLAYSTONE; MOSTLY PALE RED (SR 6/2); SPARSE IRREGULAR WHITISH SPOTS; FIRM; CRINKLY BEDDED TENDENCY; QUARTZOSE AND CLAYEY; WHITISH SPOTS VERY CALCAREOUS

1328.0 - 1329.8
 SANDSTONE; YELLOWISH GRAY (5Y 6/1); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; CALCAREOUS. UPPER AND LOWER CONTACTS INDICATE WHITE AFTERBLOW; FEW EVIDENCE OF REDUCT.

1329.8 - 1332.7
 SIMILAR TO UNIT 2ND ABOVE, BUT SANDIER AND WITH MORE BLEACHING

1332.7 - 1335.8 (NOTE UNQUESTION REDUCTION ASSOC. W/ BLEACHING AT BASE)
 SANDSTONE; OVERALL PALE RED (SR 6/3) BUT MOTTLED LIGHTER AND DARKER; BASAL 4" IS GRAYISH ORANGE PINK (10R 8/2); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULAR TO SUBROUNDED; QUARTZOSE; CALCAREOUS, ESPECIALLY WHERE BLEACHED; PERFECT GREEN RINGS AROUND RED CLAY CALLS @ BASE

1335.8 - 1337.0
 CLAYEY CONGLOMERATE; MOSTLY GRAYISH RED (SR 4/2) WITH LIGHTER STRAINERS; FIRM; BEDDED TENDENCY; LOCALLY CALCAREOUS - NOTE GREENISH TOP AND BOTTOM

1337.0 - 1338.0
 SANDSTONE GRADING DOWNWARD TO CLAYEY CONGLOMERATE; YELLOWISH GRAY (5Y 6/1); FIRM; MASSIVE; ETC. AS ABOVE; CLAY CALLS GREENISH (REDUCED)

1338.0 - 1340.0
 CLAYEY CONGLOMERATE AS UNIT 2ND ABOVE; TINY QZ-FILLED REEDS

1340.0 - 1342.4 (NOTE ALT. TOP AND BOTTOM, AS ELSEWHERE)
 SANDSTONE; MEDIAL PART PALE RED (SR 6/3); TOP AND BOTTOM VERY LT. GRAY (N 6); SIMILAR TO UNIT 2ND ABOVE; CALCAREOUS, ESP. TOP AND BOTTOM

1342.4 - 1343.4
 CLAYEY CONGLOMERATE AS UNIT 2ND ABOVE; GREENISH (REDUCED) @ TOP

1343.4 - 1344.8
 SANDSTONE; GENERALLY PALE RED (10R 6.5/3) BUT BANDED LIGHTER AND DARKER; OVERTONES OF MODERATE YELLOW (5Y 7/6) c. 1344"; BASAL 3" PINKISH GRAY (5Y 6/1); FIRM; THIN-BEDDED; CLAYEY AND QUARTZOSE; CALCAREOUS AS INDICATED; DEFINITE CARBON TRASH AT TOP; CLAY CALLS REDUCED IN BASAL BLEACH

1344.8 - 1355.3
 SILTSTONE; GRAYISH RED (SR 4/2); FIRM; MASSIVE; CLAYEY; MICACEOUS

1355.3 - 1374.8
 SANDSTONE; PREDOMINANTLY PALE RED (SR 6/4), BUT GRAYISH ORANGE PINK (5Y 6/2) 1370-1372" AND MINOR WHITISH BLEACH, ESP. TOWARD BASE; FIRM; MASSIVE TO THIN BEDDED; DISTINCT X-BEDDING MEDIALY; GENERALLY WELL SORTED; MEDIUM GRAINED; QUARTZOSE; CLAYEY AND CALCAREOUS AS INDICATED; POSSIBLE CARBON TRASH

1374.8 - 1378.0
 CLAYSTONE; GRAYISH RED (SR 4/2) GRADING DOWNWARD THROUGH GREENISH GRAY (5Y 6/1) AND LIGHT OLIVE GRAY (5Y 6/1) TO MEDIUM GRAY (N 6); FIRM; MASSIVE TENDENCY; SILTY; MEDIAL LIMESTONE AS INDICATED

1378.0 - 1427.0

DEPTH	STRIP LOG	LITHOLOGY LOG	ANALYSIS OR RADIOACTIVITY
0		1209.0 - 1212.0	
20		1212.0 - 1220.5	
40		1220.5 - 1228.5	
60		1228.5 - 1231.0	
80		1231.0 - 1233.0	
100		1320.0 - 1328.0	
120		1328.0 - 1329.8	
140		1329.8 - 1332.7	
160		1332.7 - 1335.8	
180		1335.8 - 1337.0	
200		1337.0 - 1338.0	
220		1338.0 - 1340.0	
240		1340.0 - 1342.4	
260		1342.4 - 1343.4	
280		1343.4 - 1344.8	
300		1344.8 - 1355.3	
320		1355.3 - 1374.8	
340		1374.8 - 1378.0	
360		1378.0 - 1427.0	

NOTE: INTERVAL NOT LOGGED IS ALL SIMILAR TO UNITS NEXT ABOVE AND BELOW

1320.0 - 1328.0

INTERBEDDED SILTSTONE, SANDSTONE, AND CLAYSTONE; MOSTLY PALE RED (SR 6/2); SPARSE IRREGULAR WHITISH SPOTS; FIRM; CRINKLY BEDDED TENDENCY; QUARTZOSE AND CLAYEY; WHITISH SPOTS VERY CALCAREOUS

1328.0 - 1329.8

SANDSTONE, YELLOWISH GRAY (SY 6/1); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULATE TO SUBROUNDED; QUARTZOSE; CALCAREOUS. UPPER AND LOWER CONTACTS INDICATE WHITE AFTERBURN; PEBBLE EVIDENCE OF REDUCT.

1329.8 - 1332.7

SIMILAR TO UNIT 2ND ABOVE, BUT SANDIER AND WITH MORE BLEACHING

1332.7 - 1335.8 (NOTE UNQUESTION REDUCTION ASSOC. - BLEACHING AT BASE)

SANDSTONE; OVERALL PALE RED (SR 6/3) BUT MOTTLED LIGHTER AND DARKER; BASAL 4" IS GRAYISH ORANGE PINK (10 R 8/2); FIRM; MASSIVE; WELL SORTED; MEDIUM GRAINED; SUBANGULATE TO SUBROUNDED; QUARTZOSE; CALCAREOUS, ESPECIALLY WHERE BLEACHED; PERFECT GREEN RINDS AROUND RED CLAY CALL @ BASE

1335.8 - 1337.0

CLAYGALL CONGLOMERATE; MOSTLY GRAYISH RED (SR 4/2) WITH LIGHTER STRINGERS; FIRM; BEDDED TENDENCY; LOCALLY CALCAREOUS - NOTE GREENISH TOP AND BOTTOM

1337.0 - 1338.0

SANDSTONE GRADING DOWNWARD TO CLAYGALL CONGLOMERATE; YET LITTLE GRAY (SY 6/1); FIRM; MASSIVE; ETC. AS ABOVE; CLAY CALLS GREENISH (REDUCED)

1338.0 - 1340.0

CLAYGALL CONGLOMERATE AS UNIT 2ND ABOVE; TINY QTZAL-FILLED BEDS

1340.0 - 1342.4

(NOTE ALT. TOP AND BOTTOM, AS ELSEWHERE)
SANDSTONE; MEDIAL PORTION PALE RED (SR 6/3); TOP AND BOTTOM VERY LT. GRAY (N 8); SIMILAR TO COUNTERPARTS; CALCAREOUS, ESP. TOP AND BOTTOM

1342.4 - 1343.4

CLAYGALL CONGLOMERATE AS UNIT 2ND ABOVE; GREENISH (REDUCED) @ TOP

1343.4 - 1354.8

SANDSTONE, GENERALLY PALE RED (10 R 6.5/3) BUT BANDED LIGHTER AND DARKER; OVERTONES OF MUDATON YELLOW (SY 7/6) c. 1344'; BASAL 3" PINKISH GRAY (SY 6/1); FIRM; THINBEDDED; CLAYEY AND QUARTZOSE; CALCAREOUS AS INDICATED; DEFINITE CARBON TRASH AT TOP; CLAY CALLS REDUCED IN BASAL BLEACH

1354.8 - 1355.3

SILTSTONE; GRAYISH RED (SR 4/2); FIRM; MASSIVE; CLAYEY; MUCKEY

1355.3 - 1374.8

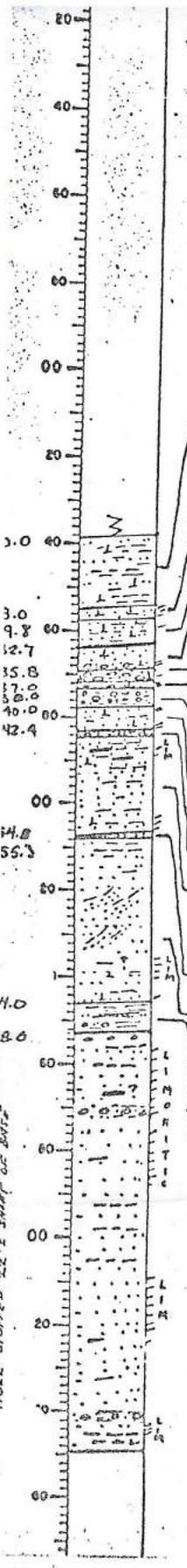
SANDSTONE; PREDOMINANTLY PALE RED (SR 6/4), BUT GRAYISH ORANGE PINK (SY 6/1c) 1370-1372' AND MINOR WHITISH BLEACH, ESP. TOWARD BASE; FIRM; MASSIVE TO THIN BEDDED; DISTINCT X-BEDDING MEDIALY; GENERALLY WELL SORTED; MEDIUM GRAINED; QUARTZOSE; CLAYEY AND CALCAREOUS AS INDICATED; POSSIBLE CARBON TRASH

1374.8 - 1378.0

CLAYSTONE; GRAYISH RED (SR 4/2) GRADING DOWNWARD THROUGH GREENISH GRAY (SY 6/1) AND LIGHT OLIVE GRAY (SY 6/1) TO MEDIUM GRAY (N 6); FIRM; MASSIVE TENDENCY; SILTY; MEDIAL "LIMESTONE" AS INDICATED

1378.0 - 1427.0

SANDSTONE; BANDED COLORS; PALE RED (SR 6/2) GRADING TO GRAYISH ORANGE, TOP 9'; BLACKISH RED (SR 2/2) NEXT 2' (CLAYGALL CONGLOMERATE); GRAYISH ORANGE (10 VE 7/4) w/ SOME PINK NEXT 8'; PALE RED (SR 6/2) NEXT 11'; GRAYISH ORANGE NEXT 6'; PALE RED (SR 6/3) NEXT 11'; GRAYISH ORANGE NEXT 1'; MIXED BELOW; FIRM; MASSIVE AND THIN-BEDDED; GENERALLY WELL SORTED; MOSTLY MEDIUM GRAINED; CARBONACEOUS AND CLAYEY AS INDICATED; QUARTZOSE; CONSPICUOUSLY LESS CALCAREOUS THAN CORRELATIVES THIS PROFILE



MILES STIPPED 22.5 INCHES OF DIST.