

## **APPENDIX 1A**

### **Lithological Summaries.**

**Baldwin-2, Baldwin2H, Baldwin-2HST1**

## APPENDIX 1A. I - BALDWIN-2 SUMMARY OF LITHOLOGICAL DESCRIPTIONS.

All depths quoted are measured depths and are measured from the drill floor rotary table.

### ARRINTHUNGA FORMATION (Late Cambrian)

From 4.7m to 384.5m: 379.8m + Thick (TVT)

|                |   |
|----------------|---|
| 5.0 to 20.0 m  | <p><u>Weathered Limestone with minor interbedded Siltstone and Claystone.</u></p> <p>LIMESTONE: Variably coloured, pale yellow brown, greyish orange, pale yellow brown, greyish red, dusky red, calcilutite to calcarenite, firm to very hard in parts, blocky to angular, sucrosic in parts, limonitic in parts, occasional red argillaceous matrix, minor quartz grains, nil to occasional fair visible porosity, no fluorescence. CALCAREOUS SILTSTONE: Greyish red, light yellowish brown, firm to hard, blocky, variably calcareous and grades to calcisiltite. CALCAREOUS CLAYSTONE: Greyish orange, light brown, pale yellow orange, homogeneous, firm to blocky, variably calcareous, occasionally grades calcilutite, trace micro-mica.</p> |
| 20.0 to 25.0 m | <p><u>Limestone with minor Calcareous Siltstone beds.</u></p> <p>LIMESTONE: Greyish red, olive grey, dark grey, light brown, calcilutite to occasional calcarenite, sucrosic in parts, occasional micritic texture, hard to moderately hard, angular to sub-platy break, argillaceous in parts, rare carbonaceous flecks, trace micro-mica, silty in parts and grades to calcareous siltstone. No visible to very poor visible porosity, no fluorescence.</p>   |
| 25.0 to 29.0 m | <p><u>Limestone with minor Calcareous Siltstone beds.</u></p> <p>LIMESTONE: Greyish brown, dark yellowish brown, greyish red, moderate orange pink, hard to very hard, blocky to angular, calcilutite to calcarenite, occasional micritic texture, occasional sucrosic texture, minor organic flecks, minor micromicaceous and argillaceous layers, nil to very poor visible porosity. SILTSTONE: Greyish brown, greyish red, hard to very hard, angular to blocky, variably calcareous, micromicaceous, grades to silty, claystone, occasionally arenaceous and grades to very fine calcareous sandstone.</p>  |
| 29.0 to 57.0 m | <p><u>Limestone with minor Calcareous Siltstone beds.</u></p> <p>LIMESTONE: pale brown, greyish brown, greyish pink, calcilutite to calcarenite, crystalline, generally homogeneous, hard to very hard, angular, argillaceous in parts, trace brown and black micro-flecks, no visible porosity. SILTSTONE: Dark to medium grey, dusky red, mottled in parts, moderately hard to very hard, angular to occasionally sub fissile, variably calcareous, micaceous in parts, trace very fine quartz grains.</p>  |

|                  |   |
|------------------|---|
| 57.0 to 120.0 m  | <p><u>Limestone with minor Interbedded Siltstone and Sandstone.</u></p> <p>LIMESTONE: greyish brown, light brown, light olive grey, pale yellowish brown, hard to very hard, crystalline, calcilutite to calcarenite, remnant ooids and peloids, sparry in parts, occasional sucrosic texture, dolomitic in parts, minor silty and organic stylolites, trace pyritic, nil to occasional poor visible porosity. SILTSTONE: dark grey to medium grey, grey brown, hard to moderately hard in parts, angular to blocky, variably calcareous, micromicaceous, minor pyrite, minor organic material. SANDSTONE: greyish pink, loose to moderately hard, very fine occasionally medium, rounded, moderately sorted, aeolian, sparry calcite cement, trace yellow-orange mineral, very poor visible to poor inferred porosity.</p>   |
| 120.0 to 143.0 m | <p><u>Limestone with minor Interbedded Siltstone.</u></p> <p>LIMESTONE: gale yellowish brown, light brown, pale red, grey, light olive grey, pale yellowish brown, calcarenite to calcilutite, crystalline, moderately hard to very hard in parts, angular, sparry, sucrosic in parts, trace ooids, minor yellow-orange mineral inclusions, occasional stylolites with organic matter, no to poor visible porosity. SILTSTONE: greyish red, light olive grey, medium to light grey, hard to firm, angular, grades to claystone, micromicaceous in parts, arenaceous in parts with very fine to occasional medium rounded quartz grains, variable calcareous. Trace black flecks.</p>  |
| 143.0 to 190.0 m | <p><u>Limestone with Interbedded Siltstone.</u></p> <p>LIMESTONE: brownish grey, greyish red, medium to dark grey, pale red, calcilutite to calcarenite, crystalline, hard to very hard, sparry in part and sucrosic, minor ooids and peloids, yellow brown mineral inclusions (siderite?), minor bituminous inclusions, variably argillaceous, grades to calcareous siltstone, trace lithic flecks, occasional bituminous inclusions at 160m, no to occasionally poor visible porosity. CALCAREOUS SILTSTONE: dominantly greyish red, red brown, medium grey in parts, firm to hard, angular to occasionally sub fissile, grades to claystone, arenaceous in parts with very fine quartz grains, commonly calcareous, grades to limestone, minor pyrite.</p>   |
| 190.0 to 280.0 m | <p><u>Interbedded Limestone, Sandstone and calcareous Siltstone.</u></p> <p>LIMESTONE: greyish orange pink, light olive grey, greyish red, pale brown, pale red, calcilutite to calcarenite, crystalline, hard to very hard, sucrosic in parts, minor ooids and peloids, argillaceous in parts, grades to calcareous siltstone, occasional bituminous inclusions, no to occasionally poor visible porosity. SANDSTONE: light to medium grey, moderately hard to friable, very fine to fine grained in parts, well sorted, sub angular, sub spherical, weak to moderate calcareous cement, silica cement, calcareous matrix in parts, calcareous clasts and inclusions, common bituminous inclusions, minor silty carbonaceous layers, very poor to poor visible porosity in parts. CALCAREOUS SILTSTONE: greyish red, dark to medium grey, greyish brown, firm to hard, blocky to angular, micromicaceous, variably calcareous.</p> |

- 280.0 to 305.0 m     Limestone with interbedded Siltstone and minor Sandstone.  
 LIMESTONE: medium to dark grey, brown black, greyish brown, hard to very hard, angular, calcilutite to calcarenite in parts, crystalline, sparry in parts with loose fine to coarse euhedral calcite in samples, occasionally sucrosic, minor argillaceous and carbonaceous stylolites, argillaceous in parts, no to occasionally poor visible porosity. SILTSTONE: medium to dark grey, dark greyish brown, hard to firm, blocky to angular, micromicaceous, grades to claystone, variably calcareous. SANDSTONE : very pale brown, light olive grey, hard to friable, very fine, well sorted, sub rounded, sub spherical, minor fine grains, quartz with minor lithic flecks, variable calcareous cement and matrix, occasional bitumen inclusions, trace black mineral specks, very poor visible to occasionally fair visible porosity.
- 305.0 - 336.0 m     Interbedded Dolomite, Limestone and Siltstone. DOLOMITE: Medium light grey, light olive grey, pale brown, dolarenite to dololutite, crystalline, very hard to firm, sucrosic in parts, trace stylolites and silty layers, trace ? anhydrite blotches, nodular pyrite, rare ooids trace cherty fragments, no to locally poor visible porosity. Dull yellow mineral fluorescence. LIMESTONE: medium light grey to light olive grey, medium grey, calcilutite, crystalline, micritic texture in parts, very hard to occasionally friable, angular to crumbly, occasionally sucrosic, argillaceous in parts, dolomitic in parts, rare ooids, no to occasional fair porosity when sucrosic. Loose euhedral calcite. SILTSTONE: medium to dark grey, dark greyish brown, hard to firm, blocky to angular, micromicaceous, grades to claystone, variably calcareous, arenaceous in parts.
- 336.0 – 384.5 m     Interbedded Dolomite and Limestone and minor Siltstone. DOLOMITE: Pale brown to very pale orange, brownish grey, dolarenite, crystalline, sucrosic, hard to very hard, angular, vuggy in parts with some calcite fill and calcite filled fractures, minor organic flecks, argillaceous and carbonaceous layers and stylolites with trace disseminated pyrite, trace fluorite. Occasional remnant ooids. Trace cherty fragments. No to occasionally poor porosity, dull yellow mineral fluorescence. LIMESTONE: medium grey to greyish brown, calcilutite, crystalline, hard to very hard, angular, dolomitic, minor nodular and disseminated pyrite, argillaceous in parts. No visible porosity.

### **CHABALOW FORMATION** (Late Cambrian)

From 384.5m to 438.0m: 53.5m Thick (TVT)

- 384.5 to 423.0 m     Dolomite with interbedded Sandstone and minor Siltstone and Limestone.  
 DOLOMITE: Pale yellowish brown, pale brown, light olive grey, brown grey in parts, dolarenite, hard aggregates with common loose sparry dolomite grains, sucrosic in parts, minor bitumen coated grains, no to very

poor inferred porosity. Some intergranular calcite. Coarser fragments indicate a packstone and boundstone. @ 420m, bitumen stained grains and dead oil stained grains. Dull yellow solid mineral fluorescence. No direct hydrocarbon fluorescence, no cut, no gas. SANDSTONE: very pale brown, light to medium grey, light olive grey, moderately hard to hard, occasionally friable, very fine to rare fine, grades to siltstone, well sorted, sub rounded, sub spherical variable calcareous cement and matrix, occasional bitumen inclusions, trace anhydrite matrix, black and brown mineral flecks, rare ?chlorite, minor siltstone beds with pyrite and disseminated pyrite, no to minor poor visible porosity.

423.0 to 429.0 m     DOLOMITE: yellow grey, light brown, dark brown, dolosiltite to dololutite, crystalline, hard to very hard, occasionally finely sucrosic, brittle, angular, minor stylolites, organic matter, no fluorescence or cut, minor brown argillaceous layers, nil to occasional very poor visible porosity, dull yellow mineral fluorescence.

429.0 to 438.0 m     DOLOMITE: pale yellowish grey, light olive grey, light brown in parts, dolosiltite to dolarenite, crystalline, moderate hard to very hard, friable in parts, commonly sucrosic with some loose dolomite crystals, trace sparry calcite, relic ooids and grainstone, trace boundstone, some arenaceous layers with very fine to silt size quartz in residue after dissolving in acid, minor bituminous material, nil to very poor visual porosity, possible fair porosity in sucrosic fragments, dull yellow mineral fluorescence.

#### **CHABALOW FORMATION: HAGEN MEMBER (Late Cambrian)**

From 438m to 483m: 45m Thick (TVT)

438.0 to 483.0 m     Dolomite with minor Siltstone beds.  
DOLOMITE: pale yellow brown, very pale orange, light olive grey, minor mottling, dolosiltite to dolarenite, crystalline, hard to very hard, brittle, angular, occasionally sucrosic, relic ooids, relic grainstone fragments, trace black mineral specks, rare organic matter, nil to occasional very poor visual porosity, dull yellow mineral fluorescence. Increasing calcite content grading to dolomitic limestone in parts. DOLOMITIC SILTSTONE: light grey to medium grey, hard, angular, variably calcareous, organic rich layers, trace disseminated pyrite, no fluorescence.

#### **Upper ARTHUR CREEK FORMATION (Middle Cambrian)**

From 483m to 611m: 128m Thick (TVT)

483.0 to 511.0 m     Dolomite with minor Siltstone beds.  
DOLOMITE: dusky brown, dark grey brown, yellowish brown, pale brown, dolosiltite to dolarenite in parts, crystalline, hard to very hard, brittle, angular, minor disaggregated dolomite and occasional calcite, silty and argillaceous layers, grades to dolomitic siltstone, minor organic material,

disseminated and nodular pyrite in parts, occasionally sparry and sucrosic, trace stylolites, occasional relic grainstone texture, trace black mineral specks, nil to very poor porosity in parts, trace anhydrite in discontinuous layers, trace dull yellow mineral fluorescence. DOLOMITIC SILTSTONE: medium grey to dusky brown, dolomitic, hard, angular, trace white flecks (anhydrite?), trace black mineral specks.

511.0 to 548.0 m     Interbedded Dolomite and Siltstone.

DOLOMITE: dusky brown, medium dark grey, dark yellowish brown, dololite to dolosiltite, crystalline, hard to very hard, brittle, angular, commonly silty and grades to siltstone, relic grainstone in parts, disseminated and nodular pyrite, trace white flecks, occasional organic rich layers, nil visible porosity, trace dull mineral fluorescence. DOLOMITIC SILTSTONE: medium grey to dusky brown, hard, angular, dolomitic to calcareous in parts, grades to argillaceous dolomite, trace white fleck, minor black mineral specks, trace disseminated pyrite.

548.0 to 558.0 m     Interbedded Dolomite and Limestone.

DOLOMITE: dusky brown to pale brown, crystalline, largely disaggregated with minor hard crystalline, dolarenite, sucrosic with calcite intergrowths, relic grainstone, trace pyrite, possible poor to fair inferred porosity, no fluorescence. LIMESTONE: pale brown to light yellowish hard aggregates, sucrosic, trace pyrite and black mineral specks, silty and argillaceous in parts, poor inferred to nil visible porosity, dull mineral fluorescence.

558.0 to 600.0 m     Interbedded Limestone and Dolomite with minor Siltstone.

LIMESTONE: pale brown to yellowish grey, olive grey, calcisiltite, crystalline, friable to hard with disaggregated grains, argillaceous and dolomitic in parts, trace pyrite, trace organic flecks, occasionally sparry, relic grainstone fragments, nil to poor inferred porosity, dull mineral fluorescence. DOLOMITE: dusky yellow brown, dark olive grey, dolosiltite, crystalline, hard to friable, brittle in parts, commonly argillaceous and silty, grading to siltstone in parts, minor stylolites, trace pyrite, nil to occasionally poor inferred porosity, trace dull mineral fluorescence. SILTSTONE: medium grey to dark grey, olive grey friable to moderately hard, loose in parts, calcareous cement, trace organic matter, trace pyrite. Occasional very fine quartz.

600.0 to 611.0 m     Interbedded Limestone and Dolomite.

LIMESTONE: light grey, light olive brown, pale brown in parts, calcarenite, crystalline, moderately hard to friable, brittle, angular, common disaggregated, argillaceous in parts with trace stylolites, sucrosic, nil to poor inferred porosity, trace dull yellow mineral fluorescence. DOLOMITE: moderate brown to greyish brown to dusky yellow brown, greyish black, dolosiltite to dolarenite, crystalline, moderately hard to very hard, friable in parts, brittle and angular, commonly disaggregated, argillaceous and grades

to siltstone in parts, minor stylolites, relic grainstone texture, occasional pyrite, sucrosic in parts and disaggregated in parts, trace organic matter and bituminous material, minor disseminated and nodular pyrite, thin limestone layers, nil to occasionally fair inferred porosity, minor dull yellow mineral fluorescence. **Fluorescence from 600m to 606m. No direct fluorescence. Dull thin residue to yellow green ring residue on crush cut.**

**ARTHUR CREEK FORMATION: OOLITIC REEF MEMBER** (Middle Cambrian)

From 611.0m to 635.5m: 24.5m Thick (TVT)

611.0 to 635.5m      Interbedded Limestone and Dolomite.

**LIMESTONE:** dusky yellow brown, dark grey brown, pale brown, mottled in parts, calcisiltite to calcarenite in parts, crystalline, hard to very hard, angular brittle in parts, occasionally sucrosic, sparry in parts, trace relic grainstone texture, occasionally dolomitic, variably argillaceous, grades to calcareous siltstone, stylolites, bituminous layers, anhydrite matrix in parts, trace disseminated and nodular pyrite, trace mineral flecks, nil to very poor visible porosity, minor vuggy porosity. **SILTSTONE:** brown black to dusky yellowish brown, moderately hard to hard, angular, blocky, calcareous, trace pyrite, trace organic flecks. **DOLOMITE:** moderate brown to pale brown to dusky yellow brown, greyish brown in parts, dolosiltite to doloarenite, crystalline, moderately hard to hard, friable in parts, brittle and angular, argillaceous grades to siltstone, trace organic matter, minor stylolites, relic grainstone texture, occasional pyrite, sucrosic in parts and disaggregated in parts, sparry in parts, vuggy, some anhydrite filled vugs nil to occasionally fair inferred porosity, minor dull yellow mineral fluorescence, some anhydrite filled vugs. **FLUORESCENCE from 618m to 621m. No direct fluorescence, dull thin residual ring yellow green residue on crush cut.**

**Lower ARTHUR CREEK FORMATION** (Middle Cambrian)

From 635.5m to 877m: 241.5m Thick (TVT)

635.5.0 to 658.0m      Limestone with Interbedded Siltstone and minor Dolomite.

**LIMESTONE:** dusky yellow brown, dark grey brown, pale brown, calcisiltite to calcilutite, crystalline, moderately hard to very hard, angular brittle in parts, minor sucrosic texture, sparry in parts, trace relic grainstone texture, occasionally dolomitic, variably argillaceous, stylolites, minor bituminous layers, grades to calcareous siltstone, trace pyrite nodules and disseminated pyrite, trace anhydrite matrix, trace mineral flecks, nil to poor visible porosity. **SILTSTONE:** dusky yellow brown, brown black, moderately hard to hard, angular, blocky, variably calcareous and grades to limestone, trace pyrite, trace organic flecks. **DOLOMITE:** moderate brown to pale brown to dusky yellow brown, dolosiltite to doloarenite, crystalline, moderately hard to hard, friable in parts, brittle and angular, argillaceous grades to siltstone, trace organic matter, minor stylolites, relic grainstone

texture, occasional pyrite, sucrosic in parts and disaggregated in parts, sparry in parts, vuggy, some anhydrite filled vugs nil to occasionally fair inferred porosity, minor dull yellow mineral fluorescence some anhydrite filled vugs.

- 658.0 to 697.0 m     Interbedded Limestone and Siltstone.  
LIMESTONE: dusky yellow brown, dark grey brown, dusky brown, calcisiltite to calcilutite, crystalline, moderately hard to very hard texture, occasionally sucrosic, argillaceous in parts, stylolites, minor organic material, trace disseminated pyrite, trace mineral flecks, nil visible to occasional very poor visible porosity. SILTSTONE: dusky brown, greyish brown, brown black, hard to moderately hard, variably calcareous, angular, blocky to sub fissile in parts, trace disseminated pyrite, trace micro mica.
- 697.0 to 722.0 m     Interbedded Siltstone and Limestone.  
SILTSTONE: Grey black to brown black, dusky brown, moderately hard to hard, angular blocky to sub fissile, variably calcareous, trace micro mica, trace disseminated pyrite. LIMESTONE: very pale brown, yellowish brown dusky yellow brown, brown black, calcisiltite to calcilutite, crystalline, moderately hard to hard, angular to occasionally, friable, sucrosic in parts, variably argillaceous, minor pyrite, minor stylolites, trace organic flecks, nil to very poor visible porosity, dull yellow mineral fluorescence in parts.
- 722.0 to 751.0 m     Interbedded Siltstone and Limestone.  
LIMESTONE: very pale brown, yellowish brown dusky yellow brown, brown black, calcisiltite to calcilutite, crystalline, moderately hard to hard, angular to occasionally, friable, sucrosic in parts, variably argillaceous, minor pyrite, minor stylolites, trace organic flecks, nil to very poor visible porosity, due yellow mineral fluorescence in parts. SILTSTONE: greyish brown to dusky yellow brown, hard to moderately hard, angular, blocky, variably calcareous, trace disseminated pyrite, grading to limestone.
- 751.0 to 776.0 m     Interbedded Limestone and Siltstone.  
LIMESTONE: Dusky brown to grey brown, brown black, calcilutite to calcisiltite, crystalline, moderately hard to hard, very hard in parts, brittle, sucrosic in parts, disaggregated in parts, trace fossil fragments, trace disseminated pyrite, argillaceous in parts and grade to siltstone, trace stylolites and organic matter, trace sparry calcite, no visible porosity. SILTSTONE: greyish brown to dusky yellow brown, hard to moderately hard, angular, blocky, variably calcareous, trace disseminated pyrite, trace mica,
- 776.0 to 806.0 m     Interbedded Limestone and Siltstone.  
LIMESTONE: Dusky brown to grey brown, calcilutite to calcisiltite, crystalline, moderately hard to hard, very hard in parts, brittle, sucrosic in parts, commonly disaggregated, trace fossil fragments, relic grainstone



texture, trace disseminated pyrite, argillaceous in parts and grades to siltstone, fossil fragments, trace sparry calcite, no visible porosity to occasionally poor. SILTSTONE: dark grey to brown black, moderately hard to very hard, brittle, angular, calcareous and grades to limestone, disseminated pyrite, trace micro-mica.

806.0 to 822.5 m

Interbedded Limestone and Siltstone.

LIMESTONE: dusky yellow brown to dark greyish brown, calcilutite to calcisiltite, crystalline, moderately hard to hard, very hard in parts, boundstone to grainstone with fossil fragments and stromatolite fragments, commonly argillaceous and silty grading to siltstone, with pale yellowish grey to light grey sucrosic limestone with minor vugs, friable to hard, poor visible porosity in parts, trace nil to occasionally poor visual porosity. SILTSTONE: dark brown grey to brown black, hard to very hard in parts, blocky, angular, variably calcareous, grades to limestone, trace disseminated pyrite, trace micro-mica.

822.5 to 852.0 m

Interbedded Siltstone and Limestone.

LIMESTONE: dusky brown to brown black becoming medium grey to medium dark grey, dusky yellow brown, mottled, calcilutite to calcisiltite, crystalline, moderately hard to very hard to blocky, increasingly argillaceous and grades to siltstone, occasionally sucrosic with sparry calcite, vuggy at 828m with some bitumen stains, dolomitic in parts, trace white and black flecks, no visible porosity. SILTSTONE: dark brown grey to dark grey to dusky brown, greyish black, hard to very hard in parts, blocky, angular, variably calcareous, trace pyrite, trace white flecks, grades to limestone.

852.0 to 877.0 m

Interbedded Limestone and Siltstone.

LIMESTONE: medium grey to medium dark grey, dusky yellow brown, pale brown, light yellowish grey, mottled in parts, calcilutite to calcisiltite, crystalline, moderately hard to hard, friable in parts, blocky, angular in parts, variably argillaceous, sucrosic with sparry calcite to micritic in parts, relic fossils fragments, trace dark mineral specks, no visible porosity to minor very poor porosity, no fluorescence.. SILTSTONE: olive black, dark brown grey to brown black, moderately hard to hard, blocky to angular, brittle, sub fissile with depth, disseminated pyrite, trace micro mica and grades to limestone.

**ARTHUR CREEK FORMATION: BASAL HOT SHALE MEMBER (Middle Cambrian)**

From 877m to 900.9m: 23.9m Thick (TVT).

877.0 to 890.0 m

Silty Claystone with minor interbedded Limestone.

SILTY CLAYSTONE: greyish black to brown black, dark olive grey, dusky brown, mottled in parts, hard to moderately hard, blocky to sub fissile, brittle and angular in parts, variably calcareous, trace micro mica,

calcareous micro-fracture fracture fill, trace very fine quartz, trace micro-mica, platy fossil fragments, organic rich material giving silty texture, bituminous odour at shakers when caught. **FLUORESCENCE: Thick moderately bright yellow-green ring residue on crush cut in 874m to 877m sample from silty claystone.** LIMESTONE: yellowish grey, pale brown in parts, dusky yellowish brown, very light grey, calcisiltite to calcarenite, crystalline, micritic texture to sucrosic, oolitic in parts with dark grey ooids, moderately hard to very friable, occasionally dolomitic, vuggy in parts with trace fluorite, trace silty rounded quartz residue on dissolving in acid, argillaceous in parts, possible light brown oil staining, nil to occasional poor visual porosity with some vuggy porosity. **FLUORESCENCE: Dull thin ring yellow fluorescent ring on crush cut from 879m to 855m.**

890.0 to 900.9 m Silty Claystone with minor interbedded Limestone.  
 SILTY CLAYSTONE: brown black, grey black, olive black, hard to very hard, brittle in parts, blocky to angular, generally non calcareous, disseminated and occasionally nodular pyrite, trace micro mica, organic rich giving a silty texture, bituminous odour at shakers, black bituminous smearing when handling unwashed cuttings. **FLUORESCENCE: Thick dull greenish yellow ring residue on crush cut 891m to 894m from siltstone.** LIMESTONE: as above, no fluorescence.

**THORNTONIA FORMATION** (Middle Cambrian)  
 From 900.9m to 950m: 49.1+m Thick (TVT).

900.9 to 925.0 m Limestone with minor Siltstone beds.  
 LIMESTONE: Pale yellowish brown, yellowish grey, very light grey, white, calcilutite to calcarenite, firm to hard in parts, friable to angular, sucrosic texture, trace relic ooids and fossil fragments, trace relic grainstone texture, argillaceous in parts grading to siltstone, calcite spar and sheared calcite plates, some gypsum, vuggy in parts with minor bitumen fill and minor anhydrite, nil to poor visible porosity with common vuggy porosity, dull yellow mineral fluorescence. SILTSTONE: brown black, dusky yellow brown, hard to firm, blocky to angular, variably calcareous and grades to limestone, trace organic matter, trace micro mica.

925.0 to 950.0 m Limestone with minor Siltstone beds  
 LIMESTONE: white, light yellowish grey, medium to light grey, calcilutite to calcarenite, very hard to firm, angular to friable, sucrosic in parts, trace relic grainstone texture, common disseminated and nodular pyrite with euhedral pyrite, rare prismatic quartz clusters, dolomitic in parts and locally grades to dolomite, argillaceous in parts with occasional argillaceous layering, nil to occasional vuggy porosity. SILTSTONE: brown

black, dusky yellow brown, hard to firm, blocky to angular, variably calcareous and grades to limestone, trace organic matter, trace micro-mica.

## 1A. II - BALDWIN-2H SUMMARY OF LITHOLOGICAL DESCRIPTIONS.

All depths quoted are measured depths relative to the drill floor.

### Upper ARTHUR CREEK FORMATION (Middle Cambrian)

From 534.0m to 607.5m: 72.5m + Thick (TVT)

|                  |  |
|------------------|--|
| 534.0 to 555.0 m | <p><u>Dolomite with interbedded Siltstone, Limestone and minor Sandstone.</u></p> <p>DOLOMITE: dusky brown to dark yellow brown, medium dark grey, dolosiltite to dolarenite, crystalline, moderately hard to very hard, sucrosic in parts, some sparry dolomite and calcite, grades to and interbedded with limestone layers, argillaceous in parts, minor pyrite, nil to occasionally vuggy porosity, no fluorescence. SILTSTONE: medium grey, dusky brown, hard, angular, dolomite, trace organic fragments, trace pyrite. LIMESTONE: pale yellowish brown, microcrystalline to crystalline, calcilutite to calcarenite, firm to hard in parts, blocky, micritic texture in parts, grades to dolomite, argillaceous in parts, no visible porosity. SANDSTONE: light grey to light brown grey, very fine and silty, rounded, well sorted, calcareous cement and matrix, trace black flecks, no visible porosity.</p> |
| 555.0 to 584.0 m | <p><u>Dolomite with interbedded Siltstone and Limestone.</u></p> <p>DOLOMITE: medium dark grey to dark grey, light olive grey to olive grey, olive black in parts, cryptocrystalline to crystalline, dololutite to dolarenite in parts, sucrosic, argillaceous and silty layers and minor stylolites, trace pyrite, grades to limestone in parts, no visible porosity. LIMESTONE: dark to pale yellow brown to yellowish grey, microcrystalline to predominantly crystalline, firm to hard, blocky, grades to dolomite, no visible porosity. SILTSTONE: medium grey to light grey, dusky brown, hard to moderately hard, friable to angular, grades to very fine sandstone in parts, calcareous to dolomitic, black organic fragments, trace pyrite.</p>   |
| 564.0 to 607.5 m | <p><u>Interbedded Limestone and Siltstone with decreasing Dolomite.</u></p> <p>LIMESTONE: dusky brown, olive grey, crystalline, calcisiltite, sucrosic, hard to friable, dolomitic in parts, commonly argillaceous and silty, sparry in parts trace organic matter, nodular pyrite, nil to poor porosity inferred in parts. SILTSTONE: medium grey to black, occasional medium light grey, firm to moderately hard, hard in parts, angular to occasionally friable, arenaceous in parts, calcareous to dolomitic, black organic fragments, disseminated and nodular pyrite, trace micro Micaceous. DOLOMITE: dark grey to olive black, medium grey to black, crystalline, dololutite to dolarenite in parts, commonly sucrosic, argillaceous and silty layers and minor stylolites, trace pyrite, grades to limestone in parts, very poor to no visible porosity.</p>  |

**ARTHUR CREEK FORMATION: OOLITIC REEF MEMBER (Middle Cambrian)**

From 607.5 to 632.5m: 23.5m Thick. (TVT)

607.5 to 632.5 m

Interbedded Limestone and Siltstone.

SILTSTONE: medium grey to dark grey, greyish black, hard to moderately hard, angular to occasionally friable, arenaceous in parts, very calcareous grading to limestone, occasional finely laminated with Limestone, black organic fragments, disseminated and nodular pyrite, trace micro Micaceous. LIMESTONE: dusky yellow brown, yellowish grey to pale brown, mottled, calcisiltite to calcarenite in parts, crystalline, firm to moderately hard in parts, angular and brittle in parts, sucrosic to occasionally sparry, trace silica fracture and vug fill, occasional pale green minerals, minor bitumen stained vugs, relic grainstone texture, oolitic in parts, stylolites and organic rich silty partings, occasionally dolomitic, trace pyrite nodules, trace mineral flecks, nil to very poor visible porosity. **Fluorescence: no direct fluorescence, trace dim spotted thin ring residue, thin ring yellow residual residue after crush cut from 621m to 627m.**

**Lower ARTHUR CREEK FORMATION (Middle Cambrian)**

From 632.5m to 992.5m MD:

632.5 to 657.0

Limestone with interbedded Siltstone.

LIMESTONE: Dusky yellowish brown to pale brown, yellowish grey, medium light grey in parts, speckled in parts, calcilutite to calcisiltite, crystalline to cryptocrystalline, micritic texture in parts, occasionally sucrosic, firm to very hard, blocky to angular, variably calcareous and grades to siltstone, disseminated organic matter and organic flecks, trace pyrite, occasionally sucrosic, no visible porosity. SILTSTONE: medium grey to greyish black, dusky brown, hard to moderately hard, angular, occasional arenaceous, variably calcareous, occasional finely laminated with Limestone, black organic fragments, disseminated and nodular, trace micro Micaceous. **Fluorescence: 639.0 to 642.0 m (Trace) No direct fluorescence. Trace very thin dim residual green ring residue after crush cut.**

657.0 to 686.0 m

Limestone with interbedded Siltstone.

LIMESTONE: pale brown to dusky yellowish brown, greyish brown, crystalline, calcisiltite, calcilutite in parts, hard to firm in parts, angular to friable in parts, micritic texture in parts, occasionally sucrosic, variably argillaceous and grades to siltstone, thin silty layers and minor stylolites, disseminated pyrite, trace black mineral specks, rare acicular yellow mineral, trace anhydrite, no visible porosity. SILTSTONE : dusky yellow brown to brownish black, commonly hard, angular, variously calcareous, firm to moderately hard in parts and blocky, disseminated pyrite, micro mica, grades to argillaceous limestone, some very hard brownish black cherty fragments and layers, some thin anhydrite layers and inclusions.

|                  |   |
|------------------|---|
| 686.0 to 728.0m  | <p><u>Interbedded Limestone and Siltstone.</u></p> <p>LIMESTONE: light olive grey to pale brown to brownish black, dark yellowish brown, calcisiltite to calcarenite, crystalline to cryptocrystalline in parts, hard to firm very hard in parts, angular to friable, commonly sucrosic, occasionally micritic texture, trace pyrite, common argillaceous, occasional anhydrite matrix, no to occasionally poor visible porosity, no fluorescence. SILTSTONE: medium grey to brownish black, firm to hard, very hard in parts, angular to blocky, variously calcareous, disseminated pyrite, micro mica, grades to argillaceous limestone, some very hard brownish black cherty fragments and layers, some thin anhydrite layers and inclusions.</p>  |
| 728.0 to 794.0 m | <p><u>Limestone with interbedded Siltstone.</u></p> <p>LIMESTONE: greyish brown to olive grey to brown black, medium grey, calcisiltite to calcilutite in parts, crystalline, firm to hard in parts, crumbly to angular, micritic texture, relic grainstone and boundstone texture in parts, common fossil fragments, frequently argillaceous and grades to siltstone, minor anhydrite matrix, very poor to nil visible porosity in parts. SILTSTONE: brown black to dark grey brown, dark grey, dusky yellow brown, very hard to firm, blocky to occasionally sub fissile, calcareous, trace micro-micaceous, grades to limestone, minor fossil fragments.</p>   |
| 794.0 to 865.0 m | <p><u>Interbedded Limestone and Siltstone</u></p> <p>LIMESTONE: brownish black, dusky yellowish brown, pale yellowish brown, greyish brown, medium grey, mottled in parts, crystalline, calcisiltite to calcarenite, very hard to firm, angular to crumbly, micritic to sucrosic texture, minor sparry calcite, relic grainstone and oolitic fragments, occasionally dolomitic, minor organic matter and bituminous stains at 843m, trace fossil fragments, argillaceous in parts and grades to siltstone, very poor to nil visible porosity. SILTSTONE: medium dark grey, brown black, greyish brown, moderately hard to hard, blocky to angular, variably calcareous, micro-micaceous, trace very fine quartz rich layers, occasional organic rich layers, interlaminated with and grades to limestone, dolomitic in parts.</p> |
| 865.0 to 921.0 m | <p><u>Siltstone with interbedded Limestone</u></p> <p>SILTSTONE: medium grey to predominantly greyish black, moderately hard to very hard, angular to blocky, rare fissile, argillaceous, calcareous and grading to Limestone in parts, trace micro mica, nodular pyrite. LIMESTONE: olive grey to dark greyish black, calcilutite to calcarenite, crystalline, cryptocrystalline in parts, firm to moderately hard, angular to crumbly, micritic in parts, commonly argillaceous and grades to siltstone, minor organic rich layers, dolomitic in parts, trace fossil fragments, trace disseminated pyrite, no visible porosity.</p>   |
| 921.0 to 942.0 m | <p><u>Siltstone with interbedded Limestone.</u></p>   |

SILTSTONE: brownish black to greyish black, hard to very hard, angular to blocky, rare fissile, argillaceous grading to Limestone in parts, variably calcareous, trace nodular pyrite, occasional black organic specks. LIMESTONE: brownish grey to olive black, calcilutite to calcarenite, crystalline to crypto-crystalline, firm to moderately hard, angular, micritic in parts, commonly argillaceous and grades to siltstone, no visible porosity.

942.0 to 969.0 m

Siltstone with interbedded Limestone.

SILTSTONE: greyish black to brownish black, moderately hard to very hard in parts, angular to blocky, calcareous in parts and grades to limestone, micromicaceous in parts, trace disseminated and nodular pyrite. LIMESTONE: grey brown, dusky yellow brown, brownish black, calcisiltite to calcilutite, crystalline, hard to firm, angular to crumbly, micritic texture in parts, commonly argillaceous and grades to siltstone, interlaminated with siltstone, rare stylolites, no visible porosity.

969.0 to 992.5 m

Siltstone with interbedded Limestone.

SILTSTONE: greyish black to brown black, medium grey to black, hard to very hard, angular, blocky, rare fissile, calcareous, grades to and interlaminated with limestone, minor micromicaceous, dolomitic in parts, trace disseminated and nodular pyrite. LIMESTONE: grey brown to medium grey to dark grey, mottled, calcisiltite, crystalline, firm to moderately hard, blocky, micritic texture in parts, commonly silty and argillaceous and grades to siltstone, finely interbedded with siltstone, dolomitic in parts with some sucrosic aggregates, no visible porosity.

**ARTHUR CREEK FORMATION: BASAL HOT SHALE MEMBER (Middle Cambrian)**

From 992.5m to 1186.0m MD: 12.5m Thick (TVT)

992.5 to 1024.0 m

Silty Claystone with minor Limestone beds.

SILTY CLAYSTONE: medium to dark grey to brownish black, greyish black, hard to very hard, angular to blocky, variably calcareous, rich in organic matter, minor calcite re-growth, common nodular and disseminated pyrite, trace minor calcite micro veins, interlaminated with limestone. LIMESTONE: mottled light to medium grey with dark grey to greyish black, calcisiltite to calcarenite, occasional crystalline, firm to moderately hard, friable, blocky, occasional micritic texture, very commonly silty and argillaceous and grades to siltstone, finely interbedded with siltstone, some sucrosic aggregates, occasional black orange specks, no visible porosity.

1024.0 to 1058.0m

Silty Claystone with minor Limestone beds and rare Sandstone.

SILTY CLAYSTONE: medium dark grey to brownish black, hard to very hard, angular to blocky, mildly calcareous, minor calcite re-growth, common nodular and

disseminated pyrite, rich in organic matter, minor calcite micro veins. LIMESTONE: mottled light to medium grey with dark grey to greyish black, calcisiltite, occasional crystalline, firm to occasional moderately hard, common friable, blocky, occasional micritic texture, very commonly silty and argillaceous and grades to siltstone, finely interbedded with siltstone, some sucrosic aggregates, occasional black orange specks, no visible porosity. SANDSTONE: medium grey to brown black, very fine, hard to moderately hard, angular to blocky, sub rounded to sub angular, well sorted, calcareous cement, silty, micromicaceous, trace disseminated pyrite, grading to SILTSTONE, no visible porosity, no fluorescence.

1058.0 to 1111.0 m Silty Claystone with minor Limestone beds.  
 SILTY CLAYSTONE: brown black to grey black, grey brown, dark grey, hard to firm, blocky to occasional sub fissile, angular in part, organic rich, micromicaceous in part, calcareous in part with calcareous inclusions and layers, minor calcite veining, disseminated and in part nodular pyrite. LIMESTONE: pale brown, greyish brown, grey black to brown black to medium grey, mottled, crystalline, calcisiltite to calcarenite, friable to moderately hard, crumbly to angular, oolitic fragments, silty and occasional quartzose layers and grades to calcareous siltstone, sucrosic texture in part, trace fossil fragments, occasional dolomitic, nil to occasional very poor visible porosity, no direct fluorescence. **Possible brown oil staining, trace oily blebs on the mud at 1080m.**

1111.0 to 1186.0 m Silty Claystone with minor Limestone, rare Sandstone  
 SILTY CLAYSTONE: brown black to grey black, grey brown, hard to firm, blocky to occasional sub fissile, occasional soft and amorphous and partially dispersive, organic rich, micromicaceous in part, minor calcareous inclusions and layers, minor calcite veining, disseminated pyrite, occasional very carbonaceous with coaly texture. LIMESTONE: mottled light to medium grey with grey brown to grey black, crystalline, calcisiltite to calcarenite in part, friable to moderately hard, crumbly to angular, oolitic fragments, silty and occasional quartzose layers, sucrosic texture in part, trace fossil fragments, occasional dolomitic, nil to occasional very poor visible porosity, no direct fluorescence. SANDSTONE: medium grey to brown black, very fine, hard to moderately hard, angular to blocky, sub rounded to sub angular, well sorted, calcareous cement, silty, micromicaceous, trace disseminated pyrite, grading to SILTSTONE, no visible porosity, very dull yellow mineral fluorescence.

### **THORNTONIA LIMESTONE (Middle Cambrian)**

From 1186.0m to 1605m MD

1186.0 to 1191.0 m Silty Claystone with Dolomite beds  
 SILTY CLAYSTONE: grey black to olive black, firm to moderately hard, blocky to sub fissile, soft to amorphous in part to occasional dispersive, organic rich arenaceous in part, common disseminated pyrite, occasional micromicaceous,



occasional calcareous inclusions and layers, trace calcite veins. DOLOMITE: very light grey to brownish grey, dolosiltite, crystalline, firm to hard in parts, angular to crumbly, calcareous inclusions and micro laminations, grading to LIMESTONE in part, commonly argillaceous, disseminated pyrite, no visible porosity, dull yellow mineral fluorescence, no direct hydrocarbon fluorescence.

1191.0 to 1272.0 m Dolomite with very minor thin stringers of Siltstone.

DOLOMITE: very light grey to dark brownish grey to pale brown, Dolarenite to Dolosiltite, crystalline, firm to hard in parts, angular to crumbly, sucrosic in parts, occasionally grading to LIMESTONE in part, occasional vugs filled with bituminous material, some large rhombs of clear gypsum, disseminated pyrite, trace stylolites, nil to occasionally poor visible porosity, poor to fair inferred secondary porosity and vugular porosity, dull yellow mineral fluorescence, no direct hydrocarbon fluorescence, no cut. SILTSTONE: grey black to olive black, firm to moderately hard, blocky to sub fissile, carbonaceous grading to CLAYSTONE in part, common disseminated pyrite, occasional micromicaceous, occasional calcareous inclusions and layers, calcite veins.

1272.0 to 1350.0 m Dolomite.

DOLOMITE: very light grey to predominantly dark brownish grey, rarely pale brown, Dolarenite to Dolosiltite, crystalline, firm to hard in parts, rarely very hard, angular to sub-angular, sucrosic in parts, calcareous occasionally grading to LIMESTONE, occasional vugs filled with bituminous material, rare rhombic gypsum (selenite), occasional disseminated pyrite, trace stylolites, rarely silicified, nil to occasionally poor visible porosity, poor to fair inferred secondary porosity and vugular porosity, dull orange yellow mineral fluorescence, no direct hydrocarbon fluorescence, no cut.

1350.0 to 1383.0 m Dolomite with minor Siltstone at 1383m

DOLOMITE: pale brownish grey to medium grey, common brownish black, DOLOARENITE to DOLOSILTITE, hard to very hard in parts, occasional friable, angular to sub angular, rarely sub fissile, commonly sucrosic, slightly calcareous, grading to LIMESTONE, common chert, disseminated pyrite, trace stylolites, occasional bituminous material in vugs and fractures, occasional rhombic gypsum (loose and as crystal regrowth), trace quartz silt, no to very poor visible porosity, poor inferred porosity, occasional dull yellow mineral fluorescence, no cut. SILTSTONE: dark grey to greyish black, occasional olive black, grey black to olive black, firm to moderately hard, angular to blocky, common disseminated pyrite, occasional micromicaceous, occasional calcareous inclusions and layers, calcite micro veins.

1383.0 to 1455.0 m Dolomite.

DOLOMITE: pale to dark greyish brown, common brownish black, DOLOARENITE to DOLOSILTITE, hard to very hard in parts, occasional friable,

angular to sub angular, rarely sub fissile, commonly sucrosic, slightly calcareous, slightly to moderately argillaceous, occasional to abundant chert, trace to common disseminated pyrite, trace stylolites, occasional rhombic gypsum (loose and as crystal regrowth), occasional calcite and gypsum veins, no to very poor visible porosity, poor inferred porosity, occasional dull yellow mineral fluorescence, no cut.

1455.0 to 1485.0

Dolomite.

DOLOMITE: medium to dark greyish brown, occasional pale brown, rarely brownish black, DOLOARENITE to DOLOSILTITE, very fine to fine, angular to sub angular, trace sub fissile, commonly sucrosic, slightly calcareous, slightly to moderately argillaceous in part, common chert, trace to common disseminated pyrite, trace stylolites, occasional rhombic gypsum (loose and as crystal regrowth), occasional calcite, dolomite and gypsum veins, hard to very hard in parts, occasionally friable, no to very poor visible porosity, poor inferred porosity, occasional dull yellow mineral fluorescence, no cut.

1485.0 to 1500.0 m

Dolomite

DOLOMITE: pale brown to dark grey brown, common medium grey brown, rarely brownish black, DOLOARENITE to DOLOSILTITE, very fine to fine, angular to sub angular, trace sub fissile, commonly sucrosic, slightly calcareous, slightly to moderately argillaceous in part, common chert, trace to common disseminated pyrite, trace stylolites, occasional rhombic gypsum (loose and as crystal regrowth), occasional calcite, dolomite and gypsum veins, hard to very hard in parts, occasionally friable, no to very poor visible porosity, poor inferred porosity, occasional dull yellow mineral fluorescence, no cut.

1500.0 to 1533.0 m

Dolomite

DOLOMITE (100%): dark grey brown to predominantly medium grey brown, rarely brownish black, DOLOARENITE to DOLOSILTITE, very fine to fine, angular to sub angular, trace sub fissile, commonly sucrosic, slightly calcareous, slightly to moderately argillaceous in part, common chert, trace to common disseminated pyrite, trace stylolites, trace to occasional rhombic gypsum (loose and as crystal regrowth), trace calcite, dolomite and gypsum veins, hard to very hard in parts, occasionally friable, no to very poor visible porosity, poor inferred porosity, trace dull yellow mineral fluorescence, no cut.

1533.0 to 1590.0 m

Dolomite

DOLOMITE: pale brown to dark grey brown, common medium grey brown, rare brownish black, DOLOARENITE to DOLOSILTITE, firm to moderately hard in parts, occasionally friable, angular to sub angular, trace sub fissile, commonly sucrosic, moderately calcareous, slightly to moderately argillaceous, cherty in parts, trace to common disseminated pyrite, trace stylolites, occasional rhombic gypsum

(loose and as crystal regrowth), trace calcite, dolomite and gypsum veins, no to very poor visible porosity, poor

1590.0 to 1604.9 m Dolomite with minor Siltstone beds

DOLOMITE with very minor SILTSTONE interbeds. DOLOMITE: pale brown to dark grey brown, common medium grey brown, rare brownish black, DOLOARENITE to DOLOSILTITE, firm to moderately hard in parts, occasionally friable, angular to sub angular, trace sub fissile, commonly sucrosic, moderately calcareous, slightly to moderately argillaceous in part, trace to common chert, trace to common disseminated pyrite, trace stylolites, trace rhombic gypsum (loose and as crystal regrowth), trace calcite, dolomite and gypsum veins, no to very poor visible porosity, poor inferred porosity, occasional dull yellow mineral fluorescence, no cut. SILTSTONE: light to middle brownish grey to dark brownish grey, brownish black in parts, argillaceous, slightly dolomitic, slightly to very carbonaceous, occasionally abundant micro-pyrite, very firm to moderately hard, sub fissile.

## 1A. III - BALDWIN-2HST1 SUMMARY OF LITHOLOGICAL DESCRIPTIONS.

All depths quoted are LWD measured depths relative to the rotary table.

### ARTHUR CREEK FORMATION: BASAL HOT SHALE MEMBER (Middle Cambrian)

From 1104.0 (Kick-off Point from Baldwin-2H) to 1952.5m MD (Total Depth)

- 1104.0 to 1156.0 m    Silty Claystone with minor Limestone beds.  
SILTY CLAYSTONE: dark grey to brownish black to grey black, moderately carbonaceous in part, mildly calcareous, occasional grading to and finely interlaminated with LIMESTONE, rare to occasional very fine quartz grains, disseminated pyrite, occasional carbonaceous specks, trace calcite inclusions and micro veins, friable and dispersive to moderately hard, rarely very hard, blocky to trace sub-fissile, occasional conchoidal, no fluorescence, no shows. LIMESTONE: greyish brown to dusky brown, occasional pale brown mottled with medium to dark grey in part, CALCISILTITE to CALCARENITE in part, soft to firm, friable in part, crumbly to angular, trace oolitic fragments, silty and occasional quartzose layers, disseminated pyrite, trace black organic inclusions, common sucrosic texture, occasional dolomitic, poor visible and inferred porosity, no fluorescence, no cut.
- 1156.0 to 1180.0 m    Silty Claystone with occasional Limestone laminae.  
SILTY CLAYSTONE: dark grey to brownish black to grey black, arenaceous in part, moderately carbonaceous in part, mildly calcareous, occasional grading to and finely interlaminated by LIMESTONE, occasional very fine quartz grains, disseminated pyrite, trace carbonaceous specks, trace calcite inclusions and micro veins, friable and dispersive to moderately hard, rarely very hard, blocky to sub-fissile, conchoidal in part, no fluorescence, no shows.
- 1180.0 to 1221.0    Silty Claystone  
SILTY CLAYSTONE: dark grey to brownish black to grey black, moderately to very carbonaceous, moderately calcareous to dolomitic, common carbonaceous flakes in part, rare very fine quartz grains, common disseminated to fine pyrite, calcite and dolomite inclusions and micro veins, occasional gypsum micro veins, moderately hard to very hard, trace friable and dispersive, blocky to sub-fissile, conchoidal to hackly fracture, no fluorescence, no shows.
- 1221.0 to 1340.0 m    Silty Claystone  
SILTY CLAYSTONE: dark grey to brownish black to grey black, moderately carbonaceous in part, occasional carbonaceous specks, rare very fine quartz grains, common to abundant disseminated to fine pyrite, calcite and dolomite inclusions and micro-veins, occasional gypsum micro veins and loose grains, moderately hard to very hard, occasional friable and dispersive, blocky to sub-fissile, trace conchoidal to hackly fracture, no fluorescence, no shows.

- 1340.0 to 1494.0 m Silty Claystone  
SILTY CLAYSTONE: dark grey to brownish black to grey black, moderately to very carbonaceous, moderately calcareous to dolomitic, common carbonaceous flakes in part, rare graphite fragments, rare very fine quartz grains, abundant disseminated to fine pyrite, calcite and dolomite inclusions and micro veins, occasional gypsum micro veins, slightly to moderately micromicaceous in part, moderately hard to very hard, trace friable and dispersive, blocky to sub-fissile, conchoidal to hackly fracture, no fluorescence, no shows.
- 1494.0 to 1594.0 Silty Claystone  
SILTY CLAYSTONE: dark grey to brownish black to grey black, moderately to very carbonaceous, moderately calcareous to dolomitic, occasional carbonaceous flakes in part, rare graphite fragments, rare very fine quartz grains, disseminated to fine pyrite, calcite and dolomite inclusions and micro veins, occasional gypsum micro veins, slightly to moderately micromicaceous in part, moderately hard to very hard, trace friable and dispersive, blocky to sub-fissile, conchoidal to hackly fracture, no fluorescence, no shows.
- 1594.0 to 1640.0 m Silty Claystone  
SILTY CLAYSTONE: dark grey to brownish black to grey black, moderately to very carbonaceous, moderately calcareous to dolomitic, occasional carbonaceous flakes in part, rare graphite fragments, rare very fine quartz grains, disseminated to fine pyrite nodules, micro veins of calcite and dolomite, occasional gypsum micro veins, slightly to moderately micromicaceous in part, moderately hard to very hard, trace friable and dispersive, blocky to sub-fissile, conchoidal to hackly fracture, no fluorescence, no shows.
- 1640.0 to 1742.0 m Silty Claystone with very minor thin stringers of Limestone.  
SILTY CLAYSTONE: dark grey to brownish black to grey black, moderately to very carbonaceous, moderately calcareous to dolomitic, occasional carbonaceous flakes in part, rare graphite fragments, rare very fine quartz grains, disseminated to fine pyrite nodules, micro veins of calcite and dolomite, occasional gypsum micro veins, slightly to moderately micromicaceous in part, moderately hard to very hard, trace friable and dispersive, blocky to sub-fissile, conchoidal to hackly fracture, no fluorescence, no shows. LIMESTONE: white and black, oolitic, very fine to fine, fine to medium black ooliths, slightly sparitic, moderately hard, very poor visible porosity, no shows, and no fluorescence.
- 1642.0 to 1780.0 m Silty Claystone.  
SILTSTONE: dark grey to brownish black to grey black, argillaceous, moderately to common carbonaceous in part, moderately calcareous to dolomitic, occasional carbonaceous flakes, rare graphite fragments, occasional very fine quartz grains, common disseminated pyrite, occasional micro veins of calcite and dolomite,

occasional gypsum micro veins, slightly to moderately micromicaceous in part, moderately hard to very hard, trace friable and dispersive, blocky to sub-fissile, occasional conchoidal to hackly fracture, no fluorescence, no shows.

1780.0 to 1911.0 m Silty Claystone

SILTY CLAYSTONE: dark brownish grey to brownish black, moderately to abundantly carbonaceous in part, slightly moderately calcareous to dolomitic, occasional very fine quartz grains, common disseminated pyrite, occasional micro veins of calcite and dolomite, occasional gypsum micro veins, slightly to moderately micromicaceous in part, moderately hard to very hard, trace friable and dispersive, blocky to sub-fissile, occasional conchoidal to hackly fracture, no fluorescence, no shows.

1911.0 to 1952.5 m Silty Claystone with minor Limestone beds

SILTY CLAYSTONE: dark brownish grey to brownish black, moderately to abundantly carbonaceous in part, strongly calcareous to dolomitic, common grading to and finely inter laminated with Limestone, occasional very fine quartz grains, common disseminated pyrite, rare micro veins of calcite and dolomite, rare gypsum micro veins, slightly to moderately micromicaceous in part, moderately hard to very hard, occasional friable and dispersive, blocky to sub-fissile, occasional sub-conchoidal to hackly fracture, no fluorescence, no shows. LIMESTONE: medium brownish grey to mottled medium light grey with medium grey to black, very fine to fine, trace fine black oolites, slightly sparitic, firm to soft, disseminated pyrite, occasional carbonaceous specks, common finely interlaminated with SILTSTONE, very poor visible porosity, no shows, no fluorescence.