

## 5. APPENDICES

- I. Reports of technical studies on velocity surveys, logs, samples, cores and sidewall cores (including petrophysical analysis, paleontology, reservoir characteristics, fluid saturation, relative permeability, capillary pressure, fluid analysis and geochemical analysis)
- II. One copy of the well completion data include -
  1. Raw field data and processed data for all Wireline logs in MWD, LWD logs in LIS, DLIS, LAS or ASCII format
  2. Field log and processed log display for all Wireline, MWD, LWD logs in PDS, META, PDF or TIF format
  3. Mudlog data (in ASCII or LAS format) and display (in TIF or PDF format)
  4. Raw data, processed data, checkshot and time/depth analysis in DLIS, SEG-Y or ASCII format
  5. Velocity survey display in TIF, JGEG, PDS or PDF format
  6. Photography of core and sidewall core in both natural and UV light in JPEG, PNG or TIF format
  7. A composite well log including, where appropriate, wireline logs, sampling and testing details, interpreted formation tops and lithology of intervals penetrated in TIF, JPEG or PDF format
  8. interpretative log analysis in LIS, DLIS, ASCII, LAS or XLS format
  9. Petrophysical, geochemical and other sample analysis
- III. A well index sheet
- IV. Report of revised structure maps and appropriate interpreted seismic sections illustrating the post-drill structural and stratigraphic interpretation of the well

\*\* Data listed above was submitted as part of EP176\_RPT\_001\_Armour Annual Activity & Expenditure EP176 in August 2012.

## Drill Cuttings – Sample Description

**0-6 m:** No sample.

**6-18 m:** SANDSTONE: white to grey, very fine to fine grained, very hard, dolomite cement, angular to sub angular, poor sorted, no visible porosity, graded to DOLOMITIC PACKSTONE: quartzose, brown to cream, minor light grey chert, calcareous in part, iron-ferruginous oxidized in part, NFSOC.

**18-24 m:** SANDSTONE: yellow to brown, mottled, very hard, very fine to fine grained, sub angular to sub rounded, siliceous cement, moderate sorted, no visible porosity, NFSOC.

**24-36 m:** SANDSTONE: brown to pink, mottled in part, hard, very fine to fine grained, sub angular to sub rounded, siliceous cement, moderate sorted, no visible porosity, minor calcite bands grading to DOLOMITIC PACKSTONE, NFSOC.

**36-84 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, no visible porosity, interbedded with SANDSTONE: brown, hard, very fine grained moderate sorted no visible porosity, minor calcite vein, NFSOC.

**84-96 m:** DOLOMITIC PACKSTONE: moderate grey to light grey, very hard, angular to blocky, dolomitic, no oil visible porosity, trace chert, grading to very fine grained sandstone, NFSOC.

**96-108 m:** DOLOMITIC PACKSTONE: moderate grey to light grey, dolomitic, very hard, angular to blocky, no visible porosity, trace calcite, NFSOC, CLAYSTONE: moderate grey to brown, dolomitic, hard, sub blocky, waxy, trace calcite, NFSOC.

**108-120 m:** DOLOMITIC PACKSTONE: moderate grey to light grey, dolomitic, very hard, angular to blocky, no visible porosity, trace calcite, NFSOC, CLAYSTONE: very dark grey to very dark brown, hard, calcareous cement microcrystalline, blocky, waxy, calcite banded, NFSOC.

**120-132 m:** DOLOMITIC PACKSTONE: light grey, hard, blocky, dolomitic, trace calcite vein, no oil fluorescence, no visible porosity. CLAYSTONE: dark, hard, blocky, dolomitic.

**132-144 m:** DOLOMITIC PACKSTONE: light grey to light brown, very hard, microcrystalline calcareous cement, blocky, waxy, minor calcareous bands, interbedded with SHALE: dark grey, very hard, dolomitic cement, blocky, NFSOC.

**144-174 m:** DOLOMITIC PACKSTONE: light grey to light brown, very hard, microcrystalline calcareous cement, blocky, no oil visible porosity, minor calcareous bands, trace siliceous spherules, NFSOC, CLAYSTONE: moderate grey to brown, dolomitic, hard, sub blocky, waxy, trace calcite, NFSOC.

**174-186 m:** CLAYSTONE: very dark grey, very hard, calcareous cement, microcrystalline, blocky, minor calcareous bands, NFSOC, DOLOMITIC PACKSTONE: grey brown to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, no fluorescence, no visible porosity.

**186-198 m:** DOLOMITIC PACKSTONE: grey brown to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, no

fluorescence, no visible porosity, CLAYSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity 5% calcareous bands.

**198-222 m:** DOLOMITIC PACKSTONE: grey brown to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, no fluorescence, no visible porosity with CLAYSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity.

**222- 240 m:** DOLOMITIC PACKSTONE: grey brown to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, no fluorescence, no visible porosity.

**240-258 m:** DOLOMITIC PACKSTONE: grey brown to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, no fluorescence, no visible porosity with CLAYSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity.

**258-264 m:** DOLOMITIC PACKSTONE: grey brown to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, no fluorescence, no visible porosity.

**264-270 m:** DOLOMITIC PACKSTONE: grey brown to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, no fluorescence, no visible porosity with CLAYSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity.

**270-284 m:** DOLOMITIC PACKSTONE: grey green to light grey, hard, blocky, argillaceous in part, cryptocrystalline, waxy, minor calcite fragment, no fluorescence, no visible porosity with CLAYSTONE: dark grey to black, hard, blocky, silty in part, trace cubic pyrite, no fluorescence, no visible porosity.

**284-320 m:** DOLOMITIC PACKSTONE: grey to light grey, hard, blocky, argillaceous in part, microcrystalline, sucrosic in part, minor calcite fragment, trace iron-ferruginous stain, no fluorescence, no visible porosity with CLAYSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity.

**320-329 m:** DOLOMITIC PACKSTONE: grey to light grey, hard, blocky, argillaceous in part, cryptocrystalline, waxy, minor calcite fragment, trace oolitic, no fluorescence, no visible porosity with CLAYSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity.

**329-334 m:** DOLOMITIC PACKSTONE: grey to light grey, hard, blocky, argillaceous in part, microcrystalline, micro sucrosic, common calcite fragment, minor fluorescence, no visible porosity. DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity with CLAYSTONE: light green grey, very hard, silty in part, quartzitic cement, no fluorescence, no visible porosity.

**334-337 m:** DOLOMITIC PACKSTONE: grey to light grey, hard, blocky, argillaceous in part, microcrystalline, micro sucrosic, common calcite fragment, minor fluorescence, no visible porosity. DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity with CLAYSTONE: light green grey, very hard, silty in

part, quartzitic cement, no fluorescence, no visible porosity Dull even cut fluorescence of some calcite fragments.

**337-340 m:** DOLOMITIC PACKSTONE: grey to light grey, hard, blocky, argillaceous in part, microcrystalline, micro sucrosic, common calcite fragment, minor fluorescence, no visible porosity. DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part, no fluorescence, no visible porosity with CLAYSTONE: light green grey, very hard, silty in part, quartzitic cement, no fluorescence, no visible porosity.

**340-358 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, argillaceous in part, microcrystalline, micro sucrosic, common calcite fragment, no fluorescence, no visible porosity DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part.

**358-361 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, argillaceous in part, microcrystalline, micro sucrosic, common calcite fragment, no fluorescence, no visible porosity. DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part - with dull, even, yellow fluorescence of some fragments, possible calcite?

**361-367 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, argillaceous in part, microcrystalline, micro sucrosic, common calcite fragment, no fluorescence, no visible porosity. DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part.

**367-370 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, argillaceous in part, microcrystalline, micro sucrosic, common calcite fragment, no fluorescence, no visible porosity. DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part. GRAINSTONE: light grey to white, hard, blocky, tight intercrystalline texture, no fluorescence, no visible porosity.

**370-403 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, argillaceous, microcrystalline, sucrosic, common calcite fragment, no fluorescence, no visible porosity DOLOMITIC MUDSTONE: dark grey to black, hard, blocky, silty in part.

**403-415 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, argillaceous, microcrystalline, waxy, calcareous in part, no fluorescence, no visible porosity.

**415-430 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, argillaceous, microcrystalline, micro sucrosic, calcite fragment common, no fluorescence, no visible porosity.

**430-445 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, microcrystalline, micro sucrosic to sucrosic in part, calcareous in part, argillaceous in part, trace bedded pyrite, no fluorescence, no visible porosity.

**445-451 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, microcrystalline, micro sucrosic to sucrosic in part, calcareous in part, argillaceous in part, trace bedded pyrite, no fluorescence, no visible porosity. CLAYSTONE: very dark grey, hard, blocky, slightly dolomitic, silty in part, no oil fluorescence, no visible porosity.

**451-472 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, microcrystalline, micro sucrosic, no fluorescence, no visible porosity.

**472-493 m:** DOLOMITIC PACKSTONE: dark grey to light grey, hard, blocky, microcrystalline, sucrosic in part, no fluorescence, no visible porosity.

**493-520 m:** CLAYSTONE: dark grey to grey, hard, sub blocky, no fluorescence, no visible porosity. DOLOMITIC PACKSTONE: grey to light grey, hard, blocky, microcrystalline, minor calcite fragment, micro sucrosic, no fluorescence, no visible porosity.

**520-544 m:** DOLOMITIC PACKSTONE: grey to dark grey, hard, blocky, microcrystalline, minor calcite fragment, micro sucrosic, no fluorescence, no visible porosity. CLAYSTONE: dark grey to black, hard, sub blocky to angular, no fluorescence, no visible porosity.

**544-553 m:** LIME PACKSTONE: black, hard, blocky, calcitic cement, microcrystalline, minor calcite fragment, no oil fluorescence with LIME MUDSTONE: light grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity.

**553-568 m:** LIME MUDSTONE: light grey to dark grey, hard, blocky, calcitic cement, microcrystalline, minor calcite fragment, no oil fluorescence with LIME PACKSTONE: grey to dark grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity.

**568-613 m:** LIME PACKSTONE: black, hard, blocky, calcitic cement, microcrystalline, minor calcite fragment, no oil fluorescence with LIME MUDSTONE: light grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity.

**613-616 m:** LIME PACKSTONE: black, hard, blocky, calcitic cement, microcrystalline, minor calcite fragment, no oil fluorescence with LIME MUDSTONE: light grey, hard, quartzitic, calcitic cement, trace pyrite, no oil fluorescence, no visible porosity.

**616-619 m:** LIME PACKSTONE: black, hard, blocky, calcitic cement, microcrystalline, minor calcite fragment, no oil fluorescence with LIME MUDSTONE: light grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity.

**619-646 m:** LIME MUDSTONE: black, hard, blocky, dolomitic/calcitic cement, microcrystalline, minor calcite fragment, no oil fluorescence with LIME PACKSTONE: light grey, hard, quartzitic, dolomitic/calcitic cement, no oil fluorescence, no visible porosity

**646-658 m:** ARGILLACEOUS LIMESTONE: black, soft to hard, blocky, dolomitic/calcitic cement, microcrystalline, moderate calcite fragment, no oil fluorescence with LIME PACKSTONE: light grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity.

**658-670 m:** ARGILLACEOUS LIMESTONE: black, soft to hard, blocky, dolomitic/calcitic cement, microcrystalline, moderate calcite fragment, no oil fluorescence with LIME PACKSTONE: light grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity, trace pyrite banded.

**670-724 m:** ARGILLACEOUS LIMESTONE: black, soft to hard, blocky, dolomitic/calcitic cement, microcrystalline, moderate calcite fragment, no oil fluorescence with LIME PACKSTONE: light grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity.

**724-739 m:** ARGILLACEOUS LIMESTONE: black, hard, blocky, calcitic cement, microcrystalline, moderate calcite fragment, no oil fluorescence with LIME PACKSTONE: light grey, hard, quartzitic, calcitic cement, no oil fluorescence, no visible porosity.

**739-766 m:** ARGILLACEOUS LIMESTONE: black, soft to hard, blocky, microcrystalline, minor quartz grains, trace calcite fragment, no oil fluorescence with DOLOMITIC PACKSTONE: light grey, hard, quartzitic, dolomitic/calcitic cement, no oil fluorescence, no visible porosity.

**766-772 m:** ARGILLACEOUS DOLOMITE: black, soft to hard, blocky, microcrystalline, minor quartz grains, no oil fluorescence, no visible porosity, weak dolomite cement with DOLOMITIC PACKSTONE: light grey, hard, quartzitic, dolomitic / calcareous cement, no oil fluorescence, no visible porosity and SANDSTONE: white angular euhedral grained, calcareous cement, thin bedded.

**772-789 m:** ARGILLACEOUS DOLOMITE: black, soft to hard, blocky, microcrystalline, minor quartz grains, no oil fluorescence, no visible porosity, weak dolomite cement with dolomitic PACKSTONE: light grey, hard, quartzitic, dolomitic/calcareous cement, no oil fluorescence, no visible porosity.

**789-804 m:** ARGILLACEOUS LIMESTONE: grey to dark grey, very hard, microcrystalline, very calcareous cement, with light grey grainstone bands, quartzitic in part, calcareous cement, no oil fluorescence, no visible porosity.

**804-813 m:** LIME PACKSTONE: black, soft to hard, blocky, minor pyrite, no oil fluorescence, no visible porosity, calcareous cement, silty in part, no oil fluorescence, no visible porosity.

**813-816 m:** ARGILLACEOUS LIMESTONE: black, hard, blocky, micaceous, minor calcite fragment, no oil fluorescence, no visible porosity, calcareous cement, disseminated pyrite, with ARGILLACEOUS DOLOMITE: white light grey, hard, quartzitic, dolomite / calcareous cement, no oil fluorescence, no visible porosity, with SANDSTONE: quartz sub-rounded grained, thin bedded.

**816-819 m:** ARGILLACEOUS LIMESTONE: black, hard, blocky, micaceous, minor calcite fragment, no oil fluorescence, no visible porosity, calcareous cement, disseminated pyrite, with ARGILLACEOUS DOLOMITE: white light grey, hard, quartzitic, dolomite / calcareous cement, no oil fluorescence, no visible porosity, with SANDSTONE: quartz sub-rounded grained, thin bedded.

**819-825 m:** ARGILLACEOUS LIMESTONE: black, hard, blocky, micaceous, minor calcite fragment, no oil fluorescence, no visible porosity, calcareous cement, disseminated pyrite, with ARGILLACEOUS DOLOMITE: white light grey, hard, quartzitic, dolomite / calcareous cement, no oil fluorescence, no visible porosity, with SANDSTONE: quartz sub-rounded grained, thin bed.

**825-837 m:** LIME PACKSTONE: grey to dark grey, hard, blocky, very calcareous, micritic, dense, microcrystalline, NFSOC.

**837-855 m:** LIMESTONE: light grey to dark grey, hard, very calcareous, micro oolite/micro sucrosic texture, cryptocrystalline, common calcite, NFSOC.

**855-894 m:** LIME PACKSTONE: dark grey to black, hard, blocky, very calcareous, micritic, dense, microcrystalline, common calcite fragment, trace dolomite, no fluorescence, no visible porosity

**894-909 m:** ARGILLACEOUS LIMESTONE: dark grey, hard, sub blocky, microcrystalline, dolomite in part, trace calcite fragment, no fluorescence, no visible porosity

**909-915 m:** LIME PACKSTONE: dark grey to black, hard, blocky, very calcareous, micritic, dense, microcrystalline, common calcite fragment, trace dolomite, no fluorescence, no visible porosity

**915-933 m:** ARGILLACEOUS LIMESTONE: dark grey, hard, sub blocky, microcrystalline, dolomite in part, trace calcite fragment, no fluorescence, no visible porosity.

**933-954 m:** LIME PACKSTONE: dark grey to black, hard, blocky, very calcareous, micritic, dense, microcrystalline, common calcite fragment, trace dolomite, no fluorescence, no visible porosity.

**954-981 m:** ARGILLACEOUS LIMESTONE: dark grey to black, hard, sub blocky, cryptocrystalline, dolomite in part, trace calcite fragment, no fluorescence, no visible porosity.

**981-990 m:** LIMESTONE: dark grey to black, hard, sub blocky, cryptocrystalline to microcrystalline, dolomite in part, trace calcite fragment, no fluorescence, no visible porosity.

**990-1011 m:** LIMESTONE: dark grey to black, light brown in part, hard, sub blocky, microcrystalline, crystalline in part, sucrosic in part, very calcareous, dolomite in part, trace calcite fragment, no fluorescence, no visible porosity DOLOMITIC PACKSTONE: dark grey, hard, sub blocky, dense, microcrystalline, no fluorescence, no visible porosity.

**1011-1014 m:** LIMESTONE: dark grey to black, hard, blocky, microcrystalline, crystalline in part, sucrosic in part, very calcareous, dolomite in part, common calcite fragment, trace pyrite, no fluorescence, no visible porosity.

**1014-1020 m:** CALCITIC SANDSTONE: grey, hard, blocky, very carbonaceous, quartzitic, fine grained, calcareous, oolitic, no fluorescence, no visible porosity

**1020-1041 m:** ARGILLACEOUS LIMESTONE: dark grey, light brown in part, hard, sub blocky, microcrystalline to crystalline, tight, sucrosic in part, minor calcite fragment, no fluorescence, no visible porosity.

**1041-1056 m:** ARGILLACEOUS LIMESTONE: dark grey, hard, sub blocky, microcrystalline to crystalline, tight, dolomite in part, minor calcite fragment, calcite veinlets, no fluorescence, no visible porosity.

**1056-1074 m:** ARGILLACEOUS LIMESTONE: dark grey, hard, sub blocky, microcrystalline, tight, dolomite in part, minor calcite fragment, no fluorescence, no visible porosity

**1074-1090 m:** ARGILLACEOUS LIMESTONE: dark grey to black, hard, blocky, sucrosic, tight, no fluorescence, no visible porosity CALCITIC SANDSTONE: grey to light grey, firm, amorphous, very fine grained, argillaceous, no fluorescence, no visible porosity.

**1090-1114 m:** LIMESTONE: light grey to grey, hard, blocky, microcrystalline, dense, very calcareous, no fluorescence, no visible porosity

**1114-1129 m:** LIMESTONE: light grey to dark grey, carbonaceous, hard, blocky, microcrystalline, dense, very calcareous, no fluorescence, no visible porosity with CLAYSTONE: dark grey, very hard, blocky, very calcareous, local silty, no fluorescence, no visible porosity.

**1129-1150 m:** ARGILLACEOUS LIMESTONE: grey to light grey, carbonaceous, hard, blocky, microcrystalline, dense, very calcareous, minor calcite veins, no fluorescence, no visible porosity, trace fine disseminated clay particles within limestone.

**1150-1159 m:** ARGILLACEOUS LIMESTONE: grey to dark grey, carbonaceous, hard, blocky, microcrystalline, dense, very calcareous, minor calcite veins, no fluorescence, no visible porosity, with trace CLAYSTONE: dark grey, hard, blocky, very calcareous.

**1159-1198 m:** ARGILLACEOUS LIMESTONE: dark grey, carbonaceous, hard, very calcareous, blocky, microcrystalline, dense, minor calcite veins, no fluorescence, no visible porosity, no visible sedimentary structures, massive.

**1198-1237 m:** ARGILLACEOUS LIMESTONE: dark grey, carbonaceous, hard, partly dolomitic increasing, blocky, microcrystalline, dense, minor calcite veins, no fluorescence, no visible porosity, no visible sedimentary structures, massive, recrystallized calcareous cement, increasing clay content.

**1237-1249 m:** ARGILLACEOUS LIMESTONE: dark grey, carbonaceous, hard, partly dolomitic increasing, blocky, microcrystalline, dense, minor calcite veins, no fluorescence, no visible porosity, no visible sedimentary structures, massive, recrystallized calcareous cement, increasing clay content. Banded pyrite, very fine grained.

**1249-1255 m:** ARGILLACEOUS LIMESTONE: dark grey, carbonaceous, hard, partly dolomitic increasing, blocky, microcrystalline, dense, minor calcite veins, no fluorescence, no visible porosity, no visible sedimentary structures, massive, recrystallized calcareous cement, increasing clay content. Trace galena; very fine grained, on fracture surface and as "massive" pieces.

**1255-1270 m:** ARGILLACEOUS LIMESTONE: dark grey, carbonaceous, hard, partly dolomitic increasing, blocky, microcrystalline, dense, minor calcite veins, no fluorescence, no visible porosity, no visible sedimentary structures, massive, recrystallized calcitic/dolomitic cement, with argillaceous dolomite: dark grey, hard, microcrystalline, carbonaceous.

**1270-1273 m:** ARGILLACEOUS LIMESTONE: dark grey, carbonaceous, hard, partly dolomitic increasing, blocky, microcrystalline, dense, minor calcite veins, no fluorescence, no visible porosity, no visible sedimentary structures, massive, recrystallized calc/dolomitic cement, with argillaceous dolomite: dark grey, hard, microcrystalline, carbonaceous. Trace galena; very fine grained, on fracture surface and as "massive" pieces.

**1273-1279 m:** ARGILLACEOUS LIMESTONE: dark grey, carbonaceous, hard, partly dolomitic increasing, blocky, microcrystalline, dense, minor calcite veins, no fluorescence,



no visible porosity, no visible sedimentary structures, massive, recrystallized calc/dolomitic cement, with argillaceous dolomite: dark grey, hard, microcrystalline, carbonaceous.

**1279-1293.2 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no visible porosity

**1293.2-1296 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, dense, blocky, microcrystalline, carbonaceous, NFSOC, with minor LIME PACKSTONE: buff-light grey, quartzose, very calcareous, thin bedded.

**1299-1305 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no visible porosity Trace galena.

**1305-1311 m:** Argillaceous DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no visible porosity

**1311-1314 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no visible porosity with 10% sphalerite: light grey to white, moderate even yellow to purple direct fluorescence, minor galena and pyrite.

**1314-1344 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no visible porosity with 10% sphalerite: light grey to white, moderate even yellow to purple direct fluorescence, minor galena and pyrite. Dolomitic PACKSTONE: light white grey to grey, hard, blocky, microcrystalline, tight intercrystalline fabric, no sedimentary structure, minor calcite fragment, trace pyrite, sphalerite and galena, 0-5% dull to moderate yellow to purple direct fluorescence, no cut fluorescence, no visible porosity

**1344-1347 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no visible porosity with 10% sphalerite: light grey to white, moderate even yellow to purple direct fluorescence, minor galena and pyrite. LIME PACKSTONE:, light grey to grey, very hard, dense, cryptocrystalline, dolomitic in part, trace disseminated pyrite and galena, no sedimentary structure, minor calcite fragment, minor mineral fluorescence, no visible porosity, 0-5% dull to moderate yellow to purple direct fluorescence, no cut fluorescence, no visible porosity.

**1347-1358 m:** LIME PACKSTONE:, light grey to grey, very hard, dense, cryptocrystalline, dolomitic in part, trace disseminated pyrite and galena, no sedimentary structure, minor calcite fragment, minor mineral fluorescence, no visible porosity., 0-5% dull to moderate yellow to purple direct fluorescence, no cut fluorescence, no visible porosity.

**1358-1373 m:** DOLOMITIC PACKSTONE: white to grey, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, trace pyrite and galena, minor natural mineral fluorescence, no visible porosity.

**1373-1379 m:** DOLOMITIC PACKSTONE: white to grey, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, trace pyrite and galena, minor natural mineral fluorescence, no visible porosity with ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no oil sedimentary structure, no oil fluorescence, no oil visible porosity.

**1379-1400 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no oil sedimentary structure, no oil fluorescence, no oil visible porosity with DOLOMITIC PACKSTONE: white to grey, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, trace pyrite and galena, minor natural mineral fluorescence, no visible porosity.

**1400-1412 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no oil sedimentary structure, no oil fluorescence, no oil visible porosity.

**1412-1445 m:** ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no oil sedimentary structure, no oil fluorescence, no oil visible porosity with DOLOMITIC PACKSTONE: white to grey, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, trace pyrite and galena, minor natural mineral fluorescence, no visible porosity.

**1445-1490 m:** DOLOMITIC PACKSTONE: white to grey, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, trace pyrite and galena, minor natural mineral fluorescence, no visible porosity with ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no oil sedimentary structure, no oil fluorescence, no oil visible porosity.

**1490-1496 m:** DOLOMITIC PACKSTONE: white to grey, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, trace pyrite and galena, minor natural mineral fluorescence, no visible porosity with increasing ARGILLACEOUS DOLOMITE: dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no oil sedimentary structure, no oil fluorescence, no oil visible porosity.

**1496-1511 m:** ARGILLACEOUS DOLOMITE: grey to dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no oil visible porosity, with minor DOLOMITIC PACKSTONE: white to grey, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, minor natural mineral fluorescence, no visible porosity, trace chert, few brecciated fragments.

**1511-1517 m:** ARGILLACEOUS DOLOMITE: grey to dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no oil visible porosity, with minor DOLOMITIC PACKSTONE: light grey to grey, grey-brown in part, cryptocrystalline to microcrystalline, very hard,

blocky, dense, calcareous in part, minor natural mineral fluorescence, no visible porosity, trace chert, few brecciated fragments.

**1517-1520 m:** ARGILLACEOUS DOLOMITE: grey to dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no oil visible porosity, with minor DOLOMITIC PACKSTONE: light grey to grey, grey-brown in part, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, minor natural mineral fluorescence, no visible porosity, few brecciated fragments.

**1520-1523 m:** ARGILLACEOUS DOLOMITE: grey to dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no oil visible porosity, with minor DOLOMITIC PACKSTONE: light grey to grey, grey-brown in part, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, minor natural mineral fluorescence, no visible porosity, trace chert, few brecciated fragments.

**1523-1538 m:** ARGILLACEOUS DOLOMITE: grey to dark grey, hard, blocky, microcrystalline, dense, carbonaceous in part, minor calcite vein, no sedimentary structure, no fluorescence, no oil visible porosity, with minor DOLOMITIC PACKSTONE: light grey to grey, grey-brown in part, cryptocrystalline to microcrystalline, very hard, blocky, dense, calcareous in part, minor natural mineral fluorescence, no visible porosity.

**1538-1592 m:** ARGILLACEOUS DOLOMITE: grey to dark grey, hard, blocky, microcrystalline, dense, silty in part, carbonaceous in part, minor calcite vein, no sedimentary structure, trace pyrite, no fluorescence, no visible porosity, DOLOMITIC PACKSTONE: light brown grey to grey, grey to brown, cryptocrystalline to crystalline, granular in part, very hard, blocky, dense, calcareous in part, minor natural mineral fluorescence, no visible porosity.

**1592-1628 m:** DOLOMITIC PACKSTONE: light brown grey to grey, cryptocrystalline - micro crystalline no, very hard, angular, dense, calcareous vein in part, minor natural mineral fluorescence, no visible porosity, trace pyrite and galena, with ARGILLACEOUS DOLOMITE: grey to dark grey, brown in part, hard, blocky, angular in part, microcrystalline, dense, silty in part, carbonaceous in part, calcite vein, trace pyrite, no fluorescence, no visible porosity.

**1628-1640 m:** DOLOMITIC PACKSTONE: light brown grey to grey, cryptocrystalline to microcrystalline, very hard, angular, dense, calcareous vein in part, minor natural mineral fluorescence, no visible porosity, trace pyrite and galena, with 20% Dolomitic PACKSTONE light pink to brown, tuffaceous with shards and crystalline fragments in matrix, minor ARGILLACEOUS DOLOMITE: grey to dark grey, brown in part, hard, blocky, angular in part, microcrystalline, dense, silty in part, carbonaceous in part, calcite vein, trace pyrite, no fluorescence, no visible porosity.

**1640-1643 m:** DOLOMITIC PACKSTONE: light brown grey to grey, cryptocrystalline to microcrystalline, very hard, angular, dense, calcareous vein in part, minor natural mineral fluorescence, no visible porosity, trace pyrite and galena, with 40% Dolomitic

PACKSTONE light pink to grey green, tuffaceous with shards and crystalline fragments inch matrix, minor mineral fluorescence, no visible porosity.

**1643-1662 m:** DOLOMITIC MUDSTONE: light brown grey to grey, cryptocrystalline to microcrystalline, very hard, angular, dense, calcareous vein in part, minor natural mineral fluorescence, no visible porosity, trace pyrite and galena, with upper to 50% Dolomitic PACKSTONE light pink to grey green, tuffaceous with shards and crystalline fragments inch matrix, minor mineral fluorescence, no visible porosity.

**1662-1680 m:** DOLOMITIC MUDSTONE: light brown, pink in part, cryptocrystalline, very hard, angular to blocky, silty in part, tuffaceous in part, vitreous shards inch tuff, calcareous vein in part, no fluorescence, no visible porosity, DOLOMITIC PACKSTONE: light grey to light green grey, cream in part, very hard, angular, cryptocrystalline to microcrystalline, argillaceous in part, minor fluorescence, no visible porosity

**1680-1695 m:** DOLOMITIC MUDSTONE: light brown to grey brown, pink in part, cryptocrystalline, very hard, angular to blocky, silty in part, tuffaceous in part, vitreous shards and crystalline fragment inch tuff, calcareous vein in part, no fluorescence, no visible porosity, DOLOMITICPACKSTONE: light green grey to cream, very hard, angular, cryptocrystalline to microcrystalline, argillaceous in part, minor fluorescence, no visible porosity.

**1695-1701 m:** DOLOMITICMUDSTONE: light brown to purple, pink in part, cryptocrystalline, very hard, angular to blocky, silty in part, tuffaceous in part, trace vitreous shards and crystalline fragment inch tuff, no fluorescence, no visible porosity, DOLOMITICPACKSTONE: light green grey to cream, very hard, angular, cryptocrystalline to microcrystalline, argillaceous in part, iron-ferruginous in part, minor fluorescence, no visible porosity.

**1701-1710 m:** DOLOMITICMUDSTONE: red brown to brown, cryptocrystalline, very hard, blocky, silty, trace tuff, no fluorescence, no visible porosity, DOLOMITICPACKSTONE: light green grey to cream, very hard, angular, cryptocrystalline, argillaceous in part, minor fluorescence, no visible porosity

**1710-1758 m:** DOLOMITICMUDSTONE: red brown to purple, cryptocrystalline, very hard, angular to blocky, silty, tuffaceous in part, trace vitreous shards and crystalline fragment inch tuff, no fluorescence, no visible porosity, DOLOMITICPACKSTONE: light green grey to cream, very hard, angular, cryptocrystalline, waxy, argillaceous in part, minor fluorescence, no visible porosity.

**1758-1761 m:** DOLOMITICPACKSTONE: light green to grey to cream, very hard, angular, cryptocrystalline, waxy, argillaceous in part, minor mineral fluorescence, no visible porosity, trace pyrite; DOLOMITICMUDSTONE: red brown to purple, cryptocrystalline, very hard, angular to blocky, silty, tuffaceous in part, trace vitreous shards and crystalline fragment inch tuff, no fluorescence, no visible porosity.

**1773-1776 m:** DOLOMITICPACKSTONE: light grey to dark grey to light green, very hard, angular, cryptocrystalline, waxy, argillaceous in part, minor mineral fluorescence, no visible porosity, with trace DOLOMITICMUDSTONE: red brown to purple, microcrystalline lower, very hard, angular to blocky, silty, fine, no fluorescence, no visible porosity.

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**1788-1797 m:** DOLOMITICPACKSTONE: light grey to dark grey to light green, very hard, angular, cryptocrystalline, waxy, argillaceous in part, minor mineral fluorescence, no visible porosity.

**1797-1805 m:** DOLOMITICMUDSTONE: red brown to purple, cryptocrystalline, very hard, angular to blocky, silty, tuffaceous in part, trace vitreous shards and crystalline fragment inch tuff, no fluorescence, no visible porosity, DOLOMITICPACKSTONE: light green grey to cream, very hard, angular, cryptocrystalline, waxy, argillaceous in part, minor fluorescence, no visible porosity.