

## **7. GEOLOGICAL LOGGING**

**BH- 01**

(00.00 – 07.10) m: Overburden.

(07.10 – 20.00) m: **Rock Description:** Highly (up to 14.75m) to moderately weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very closely spaced (>15 no's/m) spaced fractures. 1 set of fractures/ joints plus random (up to 10.25m) followed by 2 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 10.00m) to continuous framework. Cores are mostly in lengths of <30 mm and 30-100mm (up to 10.00m) followed by mostly 30-100mm and 100-200mm and locally mixed with >300 mm pieces.**Rock Mass Structure:** The rock mass is of very poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to moderately weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 02**

(00.00 – 07.00) m: Overburden.

(07.00 – 20.70) m: **Rock Description:** Highly (up to 11.50m) to moderately weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very closely spaced (>15 no's/m) fractures. 2 set of fractures/ joints plus random (up to 08.50m) followed by 2 sets of fracture.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 08.50m) to continuous framework. Cores are mostly in lengths of <30 mm and 30-100mm (up to 08.50m) followed by mostly 100-200 mm and 100-200mm alternately mixed with 150-200mm locally mixed with 200-300mm and >300 mm pieces.**Rock Mass Structure:** The rock mass is of very poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to moderately weathered

and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 03**

(00.00 – 05.00) m: Overburden.

(05.00 – 20.00) m: **Rock Description:** Highly (up to 09.50m) to moderately (up to 19.25m) weathered, light grey and brick red alternations, medium to fine grains are loose to moderately compacted (up to 05.75m) followed by tightly compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 12.50m) followed by closely (15-8 no's/m) spaced fractures. 1 set of fractures/ joints plus random (up to 09.50m) followed by 2 sets of fracture/joints (09.50-20.00m).

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 09.50m) to continuous framework. Cores are mostly in lengths of 30-100mm mixed with rare <30mm and 100-200mm locally mixed with, >300 mm and 150-200mm and randomly mixed with 200-300mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to moderately weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 04**

(00.00 – 05.00) m: Overburden.

(05.00 – 20.00) m: **Rock Description:** Highly (up to 16.25m) followed by moderately (up to 19.25m) slightly weathered, light grey and brick red alternations, medium to fine grains are loose to moderately compact (up to 08.75m) followed by moderately to tightly compacted and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m up to 14.00m) to close (15-8 no's/m) spaced fractures. 1 sets of fracture/joints (up to 08.75m) followed by 2 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 08.75m) to continuous framework. Cores are mostly in lengths of 30-100mm (up to 09.00m) alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 05

(00.00 – 02.50) m: Overburden.

(02.50 – 15.15) m: **Rock Description:** Moderately to slightly weathered (09.25m) followed by fresh, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Medium spaced (>8-5 no's/m) fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling).

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm as dominant core length alternately mixed with 100-200mm and locally mixed with 150-200mm and randomly mixed with 200-300mm and >300mm.

**Rock Mass Structure:** The rock mass is of fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is moderately to slightly weathered and modest to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Moderately to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 06

(00.00 – 07.00) m: Overburden.

(07.00 – 13.00) m: **Rock Description:** Highly weathered, light grey and brick red alternations, medium to fine grains are moderately to tightly compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close spaced (>15 no's/m to 15-8 no's/m) spaced fractures. 1 set of fractures/ joints plus random. Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 07.75m) to continuous framework. Cores are mostly in lengths of 30-100mm as dominant core length alternately mixed with 100-200mm and <30mm.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly weathered and huge amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 07

(00.00 – 04.50) m: Overburden.

(04.50 – 15.80) m: **Rock Description:** Highly (up to 09.75m) to moderately weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m up to 09.75m) to close / medium (15-8 to 8-5 no's/m) spaced fractures. 3 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling).

**Description of Core:** Recovered core occurs as discontinuous (up to 06.00m) to continuous framework. Cores are mostly in lengths of 30-100mm as dominant core length alternately mixed with 100-200mm and 100-300mm , and randomly mixed with >300 mm and 200-300mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 09.75m) to poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to moderately weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately

jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 08**

(00.00 – 05.00) m: Overburden.

(05.00 – 15.50) m: **Rock Description:** Highly (up to 11.75m) to moderately (up to 13.25m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m up to 11.75m) to close (15-8 no's/m) spaced fractures. 1 set of fractures/joints plus random (up to 07.25m) followed by 2 sets of fracture/joints (07.25-15.50m).

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 07.25m) to continuous framework. Cores are mostly in lengths of 30-100mm as dominant core length (up to 07.25m) alternately mixed with 100-200mm and 100-300mm, and locally mixed with 200-300mm and randomly mixed with >300mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 11.75m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 10**

(00.00 – 02.50) m: Overburden.

(02.50 – 15.25) m: **Rock Description:** Highly (up to 06.25m) to moderately (up to 10.00m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m up to 07.75m) to close (15-8 no's/m; up to 12.25m) followed by medium spaced (8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling).

**Description of Core:** Recovered core occurs as discontinuous (up to 03.25m) to continuous framework. Cores are mostly in lengths of 30-100mm as dominant core length (up to 03.25m) alternately mixed with 100-200mm and 200-300mm and locally mixed with >300mm and randomly mixed with <30mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 07.75m) followed by poor (up to 12.25m) to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 11**

(00.00 – 05.70) m: Overburden.

(05.70 – 16.00) m: **Rock Description:** Highly (up to 06.00m) followed by moderately /slightly (up to 14.25m) followed by almost fresh, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m up to 09.75m) followed by close/medium (15-8 to 8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling).

**Description of Core:** Recovered core occurs as discontinuous (up to 06.50m) to continuous framework. Cores are mostly in lengths of <30 mm mixed with rare 30-100mm up to 06.50m, followed by mostly 100-300 mm locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 09.75m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to almost fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 12**

(00.00 – 05.70) m: Overburden.

(05.70 – 16.00) m: **Rock Description:** Highly (up to 10.25 m) to moderately / slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very closely spaced (>15 no's/m up to 11.00m) to close / medium (15-8 to 8-5 nos/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling).

**Description of Core:** Recovered core occurs as discontinuous (up to 06.50m) to continuous framework. Cores are mostly in lengths of <30 mm mixed with rare 30-100mm up to 06.50m, followed by mostly 100-300 mm locally mixed with >300 mm pieces.**Rock Mass Structure:** The rock mass is of very poor to poor (up to 11.00m) to good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 13**

(00.00 – 06.00) m: Overburden.

(06.00 – 16.50) m: **Rock Description:** Highly (up to 07.50 m) to moderately (up to 10.50m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very closely spaced (>15 no's/m up to 08.25m) to close (15-8 up to 12.75m) followed by thickly (5-1 nos/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling).

**Description of Core:** Recovered core occurs as framework. Cores are mostly in lengths of <30 mm mixed with rare 30-100mm up to 12.00m, followed by mostly 100-300 mm locally mixed with >300 mm pieces.**Rock Mass Structure:** The rock mass is of very poor to poor (up to 12.00m) to fair / good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 14**

(00.00 – 05.30) m: Overburden.

(05.30 – 17.00) m: **Rock Description:** Highly (up to 10.50m) to slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 10.50m) followed by medium (8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling).

**Description of Core:** Recovered core occurs as discontinuous (up to 07.50m) followed by continuous framework. Cores are mostly in lengths of <30mm to 30-100mm up to 12.00m. Followed by mostly 100-300mm with locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 14.25m) followed by good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 15**

(00.00 – 05.50) m: Overburden.

(05.50 – 17.50) m: **Rock Description:** Highly (up to 07.75m) to moderately (up to 13.00m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely spaced (>15 to 15-8 no's/m; up to 13.75m) followed by medium (8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly

altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 07.00m) followed by continuous framework. Cores are mostly in lengths of <30mm to 30-100mm up to 08.50m. Followed by mostly 100-300mm with locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 13.00m) followed by fair / good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 16

(00.00 – 05.80) m: Overburden.

(05.80 – 20.00) m: **Rock Description:** Highly (up to 08.75m) to moderately (up to 11.00m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely spaced (>15 to 15-8 no's/m; up to 14.00m) followed by medium (8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as discontinuous (up to 08.00m) followed by continuous framework. Cores are mostly in lengths of <30mm to 30-100mm up to 08.00m. Followed by mostly 100-300mm with locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 14.00m) followed by fair / good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 17

(00.00 – 08.00) m: Overburden.

(08.00 – 20.00) m: **Rock Description:** Moderately (up to 14.00m) to moderately (up to

13.00m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely spaced (>15 to 15-8 no's/m; up to 13.75m) followed by medium (8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 07.00m) followed by continuous framework. Cores are mostly in lengths of <30mm to 30-100mm up to 08.50m. Followed by mostly 100-300mm with locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 13.00m) followed by fair / good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 18

(00.00 – 04.30) m: Overburden.

(04.30 – 15.00) m: **Rock Description:** Highly (up to 05.80m) followed by slightly weathered to almost fresh, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 09.55m) followed by close/medium spaced (15-8 no's/m to 8-5 no's/m) fractures. 1 set of fractures/joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 05.80m) to continuous framework. Cores are mostly in lengths of <30 mm and 30-100mm alternately mixed with 100-200 mm and 200-300mm and locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 09.55m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to almost fresh and huge to little amount of the rock mass is disintegrated and removed. It is

due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to almost fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 19**

- (00.00 – 07.00) m: Overburden.  
 (07.00 – 15.25) m: **Rock Description:** Highly (up to 13.00m) to moderately weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.  
**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 13.75m) followed by closely (15-8 no's/m) fractures. 2 set of fractures/ joints plus random (up to 13.75m) followed by 2 sets of fracture/joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to alter (up to 13.75m) followed by almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 13.75m) to continuous framework. Cores are mostly in lengths of <30 mm (up to 10.00m) followed by mostly 30-100mm and <30mm alternately mixed with 100-200mm locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 13.75m) followed by poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to moderately weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 20**

- (00.00 – 04.50) m: Overburden.  
 (04.50 – 15.20) m: **Rock Description:** Highly (up to 05.25m) to moderately (up to 08.25m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.  
**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 08.25m) followed by close/medium (15-8 no's/m to 8-5 no's/m) fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 05.25m) to continuous framework. Cores are mostly in lengths of 30-100mm and <30mm (up to 08.50m) followed by mostly 100-200 mm and 100-200mm alternately mixed with 150-200mm locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 08.25m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 21

(00.00 – 03.00) m: Overburden.

(03.00 – 20.25) m: **Rock Description:** Highly (up to 13.50m) followed by moderately to slightly weathered, light grey and brick red alternations, medium to fine grains are (up to 18.75m) followed by coarse grained moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 18.00m) followed by medium (8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 15.00m) followed by 3 sets of fractures/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 13.50m) to continuous framework. Cores are mostly in lengths of <30 mm and 30-100mm (up to 11.25m) followed by mostly 100-200 mm and 100-300mm alternately mixed with 150-200mm locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 18.00m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass

is easily crushed and removed by drill water during drilling operation.

### **BH- 22**

(00.00 – 03.00) m: Overburden.

(03.00 – 19.50) m: **Rock Description:** Highly (up to 06.75m) followed by to slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely spaced (>15 to 15-8 no's/m; up to 17.25m) followed by medium (8-5 no's/m) spaced fractures. 1 set of fractures/ joints plus random.

Open base parallel fracture surfaces are non-planar, slightly smooth to smooth and slightly altered to alter (up to 07.50m) to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 04.50) followed by continuous framework. Cores are mostly in lengths of <30mm to 30-100mm. Followed by mostly 100-300mm with locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 17.25m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

### **BH- 23**

(00.00 – 04.50) m: Overburden.

(04.50 – 20.25) m: **Rock Description:** Highly to moderately (up to 14.25m) to moderately (up to 13.00m) followed by moderately to slightly weathered (up to 19.50m) to fresh, light grey and brick red alternations, medium to fine grains are moderately to tightly compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 14.25m) followed by close to medium (15-8 to 8-5 no's/m) spaced fractures. 1 set of fractures/ joints (up to 11.25m) followed by 2 set of fracture/joints.

Open base parallel fracture surfaces are non-planar, slightly smooth to smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 06.00m) followed by continuous framework. Cores are mostly in lengths of <30mm to 30-100mm alternately mixed with 100-200 mm and 100-300mm and locally mixed with >300mm and 20-300mm

**Rock Mass Structure:** The rock mass is of very poor (up to 14.25m) followed by close to medium quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 24

(00.00 – 07.00) m: Overburden.

(07.00 – 20.00) m: **Rock Description:** Highly (up to 11.50m) to moderately (up to 13.00m) followed by slightly weathered, light grey to brick red alteration, medium to fine grains are moderately compacted **Sandstone**.

**Rock Properties:** Moderately hard and weak and moderately strong rock.

**Structural Condition:** Very close to close (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 16.75m) followed by 3 set of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 16.00m) followed by continuous framework. Cores are mostly in lengths of <30mm to 30-100mm as dominant core length (up to 09.25m) followed by 100-200mm and 100-300mm and randomly mixed with 200-300mm and locally mixed with >300mm.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 25

(00.00 – 03.00) m: Overburden.

(03.00 – 25.00) m: **Rock Description:** Highly (up to 11.75m) followed by moderately (up to 13.25m) then slightly weathered, light grey and brick red alternations, medium to fine grains are moderately to tightly compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 12.50m) followed by close (15-8 no's/m; up to 17.00m) then medium (8-5 no's/m) spaced fractures. 1 set of fractures/ joints plus random (up to 11.75m) followed by 2 sets of fractures/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 11.75m) to continuous framework. Cores are mostly in lengths of <30 mm and 30-100mm (up to 11.75m) followed by mostly 30-100mm and 100-200mm locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 12.50m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 26

(00.00 – 04.00) m: Overburden.

(04.00 – 18.00) m: **Rock Description:** Highly (up to 06.25m) followed by moderately to slightly weathered (up to 15.25m) then almost fresh, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 07.75m) followed by close to medium (15-8 no's/m to 8-5 no's/m) spaced fractures. 1 set of fractures/ joints plus random (up to 06.25m) followed by 2 sets of fractures/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 05.50m) to continuous framework. Cores are mostly in lengths of <30 mm (up to 05.50m) followed by mostly 100-200 mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 05.50m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to almost fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated

weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 27**

(00.00 – 03.00) m: Overburden.

(03.00 – 20.25) m: **Rock Description:** Highly (up to 09.00m) followed by moderately (up to 12.75m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 12.75m) followed by close (15-8 no's/m) spaced fractures. 2 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 09.75m) to continuous framework. Cores are mostly in lengths of 30-100 mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 12.75m) followed by poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 28**

(00.00 – 02.50) m: Overburden.

(02.50 – 20.00) m: **Rock Description:** Highly (up to 04.75m) then moderately to slightly weathered (up to 17.50m) followed by fresh, light grey and brick red alternations, medium to fine grains are loosely to moderately compacted (up to 05.00m) followed by moderately to densely compact **Sandstone**

**Rock Properties:** Moderately hard and weak and moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 14.50m) followed by close (15-8 no's/m) spaced fractures. 1 set of fractures/ joints (up to 04.00m) followed by 2 set of fracture/joints.

Open base parallel fractures surfaces are non-planar, slightly smooth to smooth, and clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 16.00m) followed by continuous framework. Cores of 30-100mm as

dominant core length alternately mixed with 100-200mm and 100-300mm and locally mixed with 30-100mm and randomly mixed with >300mm and 200-300mm.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 29**

(00.00 – 03.00) m: Overburden.

(03.00 – 25.00) m: **Rock Description:** Highly (up to 05.25m) followed by moderately to slightly weathered (up to 24.00m) followed by fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 05.25m) followed by close to medium (15-8 no's/m to 8-5 no's/m; up to 24.00m) followed by thickly (5-1 no's/m) spaced fractures. 3 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 04.50m) to continuous framework. Cores are mostly in lengths of <30mm and 30-100 mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 05.25m) followed by poor to fair (up to 24.00m) followed by good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 30**

(00.00 – 03.00) m: Overburden.

(03.00 – 20.25) m: **Rock Description:** Highly (up to 05.25m) followed by moderately to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m) followed by close (15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 13.00m) followed by 3 sets of fracture.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 12.75m) to continuous framework. Cores are mostly in lengths of 30-100 mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 12.75m) followed by poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 31

(00.00 – 02.50) m: Overburden.

(02.50 – 20.30) m: **Rock Description:** Moderately (up to 08.75m) to slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Closely to medium spaced (15-8 to 8-5 no's/m) fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 100-200mm up to 08.75m. Followed by mostly 100-300mm with locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of fair to good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 32**

(00.00 – 03.50) m: Overburden.

(03.50 – 20.00) m: **Rock Description:** Highly (up to 05.75m) to moderately /slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very closely (>15 nos/m; up to 07.25m) followed by close to medium (15-8 to 8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm with 100-300mm, locally mixed with >300 mm pieces.**Rock Mass Structure:** The rock mass is of very poor (up to 07.00m) to fair /good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 33**

(00.00 – 03.00) m: Overburden.

(03.00 – 18.56) m: **Rock Description:** Highly (up to 03.75m) followed by moderately to slightly weathered (up to 13.50m) then fresh, light grey and brick red alternations, medium to fine grains are moderately to densely compact **Sandstone**.**Rock Properties:** Moderately hard and weak and moderately strong rock.**Structural Condition:** Very close to close spaced (>15 no's/m to 15-8 no's/m; up to 13.50m) followed by medium (8-5 no's/m) spaced fractures. 1 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to alter (up to 05.00m) followed by almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores of 30-100mm as dominant core length followed by 30-100mm and 100-200mm and locally mixed with 200-300mm and >300mm pieces .**Rock Mass Structure:** The rock mass is of very poor (up to 13.50m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 34**

(00.00 – 03.00) m: Overburden.

**Rock Description:** Highly (up to 04.50m) to moderately (up to 09.00m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely (>15 nos/m; up to 04.50m) followed by close to medium (15-8 to 8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean (calcite filling) to fresh.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm with 100-300mm, locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of fair to good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 35**

(00.00 – 02.00) m: Overburden.

**Rock Description:** Moderately to slightly weathered (up to 13.25m) followed by fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** close to medium (15-8 no's/m to 8-5 no's/m) spaced fractures. 3 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous

framework. Cores are mostly in lengths of 30-100 mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is moderately to slightly weathered and modest to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Moderately to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 36**

(00.00 – 02.50) m: Overburden.

(02.50 – 15.22) m: **Rock Description:** Moderately to slightly weathered (up to 10.00m) followed by fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Close to medium (15-8 no's/m to 8-5 no's/m: up to 12.25m) followed by thickly (5-1 no's/m) spaced fractures. 1 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 100-200mm alternately mixed with 150-200mm and 30-100mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of poor to fair (up to 12.25m) followed by good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is moderately to fresh and modest to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Moderately to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 37**

(00.00 – 01.50) m: Overburden.

(01.50 – 15.25) m: **Rock Description:** Highly (up to 02.25m) followed by moderately to slightly weathered (up to 09.00m) followed by almost fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 nos/m; up to 06.00m) followed by close to medium (15-8 nos/m to 8-5 nos/m) spaced fractures. 1 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 02.50m) to continuous framework. Cores are mostly in lengths of 30-100 mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 06.00m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 38

(00.00 – 04.00) m: Overburden.

(04.00 – 20.00) m: **Rock Description:** Highly (up to 07.00m) to moderately /slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 nos/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm with 100-300mm, locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 07.00m) to fair /good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 39**

(00.00 – 03.00) m: Overburden.

(03.00 – 20.00) m: **Rock Description:** Moderately to slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very close to close (>15 to 15-8 nos/m; up to 13.50m) to medium spaced (8-5 no's/m) fractures. 2 set of fractures/joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 100-200 mm with pockets of 30-100mm and 100-300mm pieces.**Rock Mass Structure:** The rock mass is of very poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 40**

(00.00 – 02.50) m: Overburden.

(02.50 – 20.00) m: **Rock Description:** Moderately (up to 03.25m) to slightly weathered / almost fresh, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very close (>15 nos/m; up to 04.00m) to closely / medium spaced (15-8 to 8-5 no's/m) fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are non-planar, smooth and altered (calcite filling) to fresh.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm up to 04.00m. Followed by mostly 100-300mm with locally mixed with >300 mm pieces.**Rock Mass Structure:** The rock mass is of very poor (up to 03.25m) followed by fair to good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed.

It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 41**

(00.00 – 02.50) m: Overburden.

(02.50 – 20.50) m: **Rock Description:** Highly (up to 04.00m) to moderately/slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very closely (>15 no's/m; up to 08.50m) followed by close to medium (15-8 to 8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm with 100-300mm, locally mixed with >300 mm pieces.**Rock Mass Structure:** The rock mass is of very poor (up to 08.50m) to fair /good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 42**

(00.00 – 02.50) m: Overburden.

(02.50 – 20.50) m: **Rock Description:** Highly (up to 04.75m) then moderately to slightly weathered (up to 16.75m) followed by fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.**Rock Properties:** Moderately hard and weak to moderately strong rock.**Structural Condition:** Very closely spaced (>15 no's/m; up to 04.00m) followed by close to medium (15-8 to 8-5 no's/m; up to 16.75m) followed by thick (5-1 no's/m) spaced fractures. 2 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 03.25m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 04.00m) poor to fair (up to 6.75m) to good quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 43

(00.00 – 02.00) m: Overburden.  
(02.00 – 18.50) m:

**Rock Description:** Highly (up to 02.75m) followed by moderately (up to 05.00m) then slightly weathered to fresh , light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 07.25m) followed by close (15-8 no's/m; up to 13.25m) followed by medium (8-5 no's/m) spaced fractures. 2 set of fractures/ joints. Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 02.75m) to continuous framework. Cores are mostly in lengths of <30 mm (up to 02.75m) alternately mixed with 100-200mm and 100-300mm and locally mixed with 30-100mm and 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 07.25m) followed by poor (up to 13.25m) then fair quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 44

(00.00 – 02.00) m: Overburden.  
(02.00 – 24.25) m:

**Rock Description:** Moderately (up to 06.50m) to slightly weathered /

fresh, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to medium (>15 to 8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as discontinuous (up to 0.275m) to continuous framework. Cores are mostly in lengths of 100-200 mm with pockets of 30-100mm and 100-300mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to moderately jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 45**

(00.00 – 02.00) m: Overburden.

(02.00 – 20.09) m: **Rock Description:** Highly (up to 04.25) followed by moderately to slightly weathered (up to 19.25m) to fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 05.75m) followed by close to medium (15-8 no's/m to 5-8 no's/m) spaced fractures. 2 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 03.50m) to continuous framework. Cores are mostly in lengths of 30-100 mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 05.75m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated

weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 46**

(00.00 – 03.00) m: Overburden.

(03.00 – 12.79) m: **Rock Description:** Highly (up to 03.75m) followed by moderately to slightly weathered (up to 08.25m) to almost fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 03.75m) followed by close to medium (15-8 no's/m to 8-5 no's/m; up to 09.00m) followed by thick (5-1 no's/m) spaced fractures. 2 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 03.75m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 03.75m) followed by poor to fair (up to 09.00m) then good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 47**

(00.00 – 06.50) m: Overburden.

(06.50 – 20.00) m: **Rock Description:** Highly (up to 08.00m) followed by moderately to slightly weathered (up to 16.25m) followed by fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 09.50m) followed by close to medium (15-8 no's/m to 8-5 no's/m; up to 16.25m) followed by thick (5-1 no's/m) spaced fractures. 1 set of fractures/ joints (up to 13.25m) followed by 2 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 08.00m) to continuous framework. Cores are mostly in lengths of 30-100mm and <30mm (up to 08.75m) alternately mixed with 100-200mm and 100-300mm and locally mixed with 150-200mm and 200-300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 09.50m) followed by poor to fair (up to 16.25m) followed by good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 48

(00.00 – 01.50) m: Overburden.

(01.50 – 20.25) m: **Rock Description:** Highly (up to 03.00m) followed by moderately to slightly weathered (up to 18.75m) then fresh, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely (>15 no's/m; up to 10.25m) followed by close to medium (15-8 no's/m to 8-5 no's/m) spaced fractures. 2 set of fractures/ joints plus random.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm with 100-300mm, locally mixed with >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 10.25m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 49

(00.00 – 01.80) m: Overburden.

(01.80 – 20.00) m: **Rock Description:** Highly (up to 04.00m) followed by moderately to slightly weathered, light grey and brick red alternations, medium to

fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely (>15 no's/m; up to 07.75m) followed by close to medium spaced (15-8 no's/m to 8-5 no's/m) fractures. 1 set of fractures/ joints (up to 03.25m) followed by 2 sets of fracture/joints

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean to fresh.

**Description of Core:** Recovered core occurs as discontinuous (up to 03.25m) followed by continuous framework. Cores are mostly in lengths of 100-200 mm with pockets of 30-100mm and 100-300mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 07.75m) followed by poor to fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 50

(00.00 – 01.50) m:

Overburden.

(01.50 – 15.00) m:

**Rock Description:** Highly (up to 07.50m) followed by moderately weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely (>15 no's/m; up to 12.75m) followed by close to medium spaced (15-8 no's/m to 8-5 no's/m) fractures. 2 set of fractures/ joints (up to 07.50m) followed by 1 sets of fracture/joints

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 03.00m) followed by continuous framework. Cores are mostly in lengths of 30-100 mm with pockets of 100-200mm and rare 100-300mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 13.50m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to moderately weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured,

loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 51**

- (00.00 – 01.30) m: Overburden.  
 (01.30 – 15.00) m: **Rock Description:** Highly (up to 03.50m) to moderately (up to 10.25m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.  
**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints (up to 03.50m) followed by 1 sets of fracture/joints  
 Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 02.75m) followed by continuous framework. Cores are mostly in lengths of 30-100 mm with pockets of 100-200mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.  
 At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 52**

- (00.00 – 01.50) m: Overburden.  
 (01.50 – 15.00) m: **Rock Description:** Highly (up to 07.50m) to moderately (up to 13.50m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.  
**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely (>15 no's/m) spaced fractures. 2 set of fractures/ joints (up to 07.50m) followed by 1 sets of fracture/joints  
 Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to

05.25m) followed by continuous framework. Cores are mostly in lengths of 30-100 mm with rare pockets of 100-200mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 53**

(00.00 – 01.50) m: Overburden.

(01.50 – 15.00) m: **Rock Description:** Highly (up to 03.75m) to moderately / slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints (up to 03.75m) followed by 1 sets of fracture/joints

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 02.25m) followed by continuous framework. Cores are mostly in lengths of 30-100 mm with rare pockets of 100-200mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 54**

(00.00 – 05.00) m: Overburden.

(05.00 – 17.75) m: **Rock Description:** Highly (up to 07.25m) to moderately (up to 14.75m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints (up to 03.50m) followed by 1 sets of fracture/joints

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 05.75m) followed by continuous framework. Cores are mostly in lengths of 30-100 mm with pockets of 100-200mm and rare 100-300mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 55**

(00.00 – 03.50) m: Overburden.

(03.50 – 16.25) m: **Rock Description:** Highly (up to 05.75m) to moderately (up to 12.50m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m; up to 11.00 m depth), followed by medium (8-5 no's/m) spaced fractures. 2 set of fractures/ joints (up to 05.75m) followed by 1 sets of fracture/joints

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 05.00m) followed by continuous framework. Cores are mostly in lengths of 30-100 mm with pockets of 100-200mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 11.00 m), followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and

subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 56**

(00.00 – 05.50) m: Overburden.

(05.50 – 19.50) m: **Rock Description:** Highly (up to 08.50m) to moderately (up to 17.50m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints (up to 05.00m) followed by 1 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 05.00m) followed by continuous framework. Cores are mostly in lengths of 30-100 mm with pockets of 100-200mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 16.00 m), followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 57**

(00.00 – 02.80) m: Overburden.

(02.80 – 19.50) m: **Rock Description:** Highly (up to 06.75m) to moderately (up to 18.00m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints (up to 05.00m) followed by 1 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 05.25m) followed by continuous framework. Cores are mostly in

lengths of 30-100 mm with pockets of 100-200mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 18.00 m), followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 58**

(00.00 – 04.30) m: Overburden.

(04.30 – 15.00) m: **Rock Description:** Highly (up to 07.25m) to moderately (up to 14.00m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints (up to 05.00m) followed by 1 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100 mm with pockets of 100-200mm and rare 100-300mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 13.25 m), followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- 59**

(00.00 – 02.00) m: Overburden.

(02.00 – 15.00) m: **Rock Description:** Highly (up to 05.75m) followed by moderately to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong

rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 08.75m) followed by close (15-8 no's/m) spaced fractures. 1 set of fractures/ joints (up to 04.25m) followed by 2 sets of fracture/joints. Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 04.25m) to continuous framework. Cores are mostly in lengths of 30-100mm and <30mm (up to 03.50m) alternately mixed with 100-200mm and 100-300mm and locally mixed with 150-200mm and 200-300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 08.75m) followed by poor quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slight jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### BH- 60

(00.00 – 01.30) m: Overburden.

(01.30 – 14.75) m: **Rock Description:** Highly (up to 02.75m) to moderately (up to 13.25m) followed by slightly weathered, light grey and brick red alternations, medium to fine grains are moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely to closely (>15 to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints (up to 05.00m) followed by 1 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100 mm with pockets of 100-200mm pieces at places.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 10.25 m), followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to modest amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once

the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**BH- 61**

(00.00 – 02.00) m: Overburden.

(02.00 – 15.00) m: **Rock Description:** Highly (up to 02.75m) followed by moderately to slightly weathered (up to 13.25m) then fresh, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very closely spaced (>15 no's/m; up to 04.25m) followed by close to medium (15-8 no's/m to 8-5 no's/m; up to 14.00m) followed by thick (5-1 no's/m) spaced fractures. 1 set of fractures/ joints (up to 02.75m) followed by 2 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 02.75m) to continuous framework. Cores are mostly in lengths of 30-100mm and <30mm (up to 02.75m) alternately mixed with 100-200mm and 100-300mm and locally mixed with 150-200mm and 200-300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 04.25m) followed by poor to fair (up to 14.00m) followed by good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to fresh and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to fresh jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**IBH- 08**

(00.00 – 04.50) m: Overburden.

(04.50 – 25.00) m: **Rock Description:** Highly (up to 09.00m) followed by moderately to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 3 set of fractures/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 08.20m) to continuous framework. Cores are mostly in lengths of 30-100mm and <30mm alternately mixed with 100-200mm and 100-

300mm and locally mixed with 150-200mm and 200-300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 09**

(00.00 – 05.00) m: Overburden.

(05.00 – 25.25) m: **Rock Description:** Highly (up to 13.25m) followed by moderately to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m; up to 22.25m) followed by medium (8-5 no's/m; up to 24.25m) then wide spaced (5-1 no's/m) spaced fractures. 1 set of fractures/joints (up to 14.00m) followed by 2 sets of fractures/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 08.20m) to continuous framework. Cores are mostly in lengths of 30-100mm and <30mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 150-200mm and 200-300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 22.25m) followed by fair (up to 24.25) then good quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 10**

(00.00 – 05.00) m: Overburden.

(05.00 – 25.10) m: **Rock Description:** Highly (up to 12.50m) followed by moderately (up to 23.00m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong

rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m; up to 24.50m) followed by medium (8-5 no's/m) spaced fractures. 1 set of fractures/ joints plus random (up to 07.25m) followed by 2 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 07.25m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 150-200mm and 200-300 mm and randomly with >300mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 24.50m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 11**

(00.00 – 05.00) m: Overburden.

(05.00 – 25.05) m: **Rock Description:** Highly (up to 17.75m) followed by moderately to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close (>15 no's/m; up to 20.00m) followed by close (15-8 no's/m) spaced fractures. 1 set of fractures/ joints (up to 07.25m) followed by 2 sets of fracture/joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 07.25m) to continuous framework. Cores are mostly in lengths of <30mm (up to 07.25m) followed by 30-100mm alternately mixed with 100-200mm and 100-300mm and locally mixed with 200-300mm and >300 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor (up to 20.00m) to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed

nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

### **IBH- 12**

(00.00 – 03.80) m: Overburden.

(03.80 – 17.25) m: **Rock Description:** Highly (up to 12.00m) followed by moderately (up to 15.75m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 12.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 5.25m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 15.75m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

### **IBH- 13**

(00.00 – 03.50) m: Overburden.

(03.50 – 20.00) m: **Rock Description:** Highly (up to 07.25m) followed by moderately (up to 17.75m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 07.25m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 4.25m) to continuous framework. Cores are mostly in lengths of 30-

100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 16.25m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 14**

(00.00 – 01.50) m: Overburden.

(01.50 – 17.25) m: **Rock Description:** Highly (up to 09.00m) followed by moderately (up to 15.00m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone.**

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 05.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 5.25m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 15.00m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 15**

(00.00 – 02.00) m: Overburden.

(02.00 – 20.75) m: **Rock Description:** Highly (up to 14.00m) followed by moderately (up to 17.00m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone.**

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 08.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 20.00m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### IBH- 16

(00.00 – 03.60) m: Overburden.

(03.60 – 25.25) m: **Rock Description:** Highly (up to 08.00m) followed by moderately (up to 23.00m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 08.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 23.75m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently

the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 17**

(00.00 – 01.50) m: Overburden.

(01.50 – 18.00) m: **Rock Description:** Highly (up to 07.50m) followed by moderately (up to 15.00m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 06.25m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 3.00m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 15.00m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 18**

(00.00 – 01.30) m: Overburden.

(01.30 – 20.00) m: **Rock Description:** Highly (up to 09.50m) followed by moderately (up to 17.25m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 05.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 2.75m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and

randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 19**

(00.00 – 00.80) m: Overburden.

(00.80 – 14.50) m: **Rock Description:** Highly (up to 08.75m) followed by moderately (up to 12.50m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 06.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 11.00m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **IBH- 20**

(00.00 – 01.00) m: Overburden.

(01.00 – 17.50) m: **Rock Description:** Highly (up to 07.75m) followed by moderately (up to 15.25m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 05.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 03.25m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 12.25m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### IBH- 21

(00.00 – 00.80) m: Overburden.

(00.80 – 15.75) m: **Rock Description:** Highly (up to 05.25m) followed by moderately (up to 12.75m) to slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 03.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 5.25m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 10.50m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass

is easily crushed and removed by drill water during drilling operation.

#### **BH- 22**

(00.00 – 01.20) m: Overburden.

(01.20 – 20.75) m: **Rock Description:** Highly (up to 05.00m) followed by moderately / slightly weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 05.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 2.00m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 12.50m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth.

At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

#### **BH- PLT 04**

(00.00 – 03.50) m: Overburden.

(03.50 – 15.00) m: **Rock Description:** Highly (up to 08.00m) to moderately weathered, light grey and brick red alternations, medium to fine grains moderately compact and medium bedded **Sandstone**.

**Rock Properties:** Moderately hard and weak to moderately strong rock.

**Structural Condition:** Very close to close (>15 no's/m to 15-8 no's/m) spaced fractures. 2 set of fractures/ joints plus random (up to 05.00m) followed by 1 sets of fracture/ joints.

Open base parallel fracture surfaces are planar, smooth and slightly altered to almost clean.

**Description of Core:** Recovered core occurs as discontinuous (up to 5.00m) to continuous framework. Cores are mostly in lengths of 30-100mm alternately mixed with 100-200mm and 100-300mm and randomly mixed with <30 mm pieces.

**Rock Mass Structure:** The rock mass is of very poor to poor (up to 12.50m) followed by fair quality.

Partial drill water loss has been noticed for the entire depth. At some depths the formation rock is highly to slightly weathered and huge to little amount of the rock mass is disintegrated and removed. It is due to prolonged weathering, intensely fractured, loosely compacted and weak nature of the rock. Highly to slightly jointed nature facilitated weathering within the rock mass and subsequently the rock mass broken down into smaller pieces. Once the rock has been weakened and broken up by weathering, such loose rock mass is easily crushed and removed by drill water during drilling operation.

**For C. E. Testing Company Private Limited,**

**(G. Mukherjee, Geologist)**

**(S. Paramanik, Geologist)**