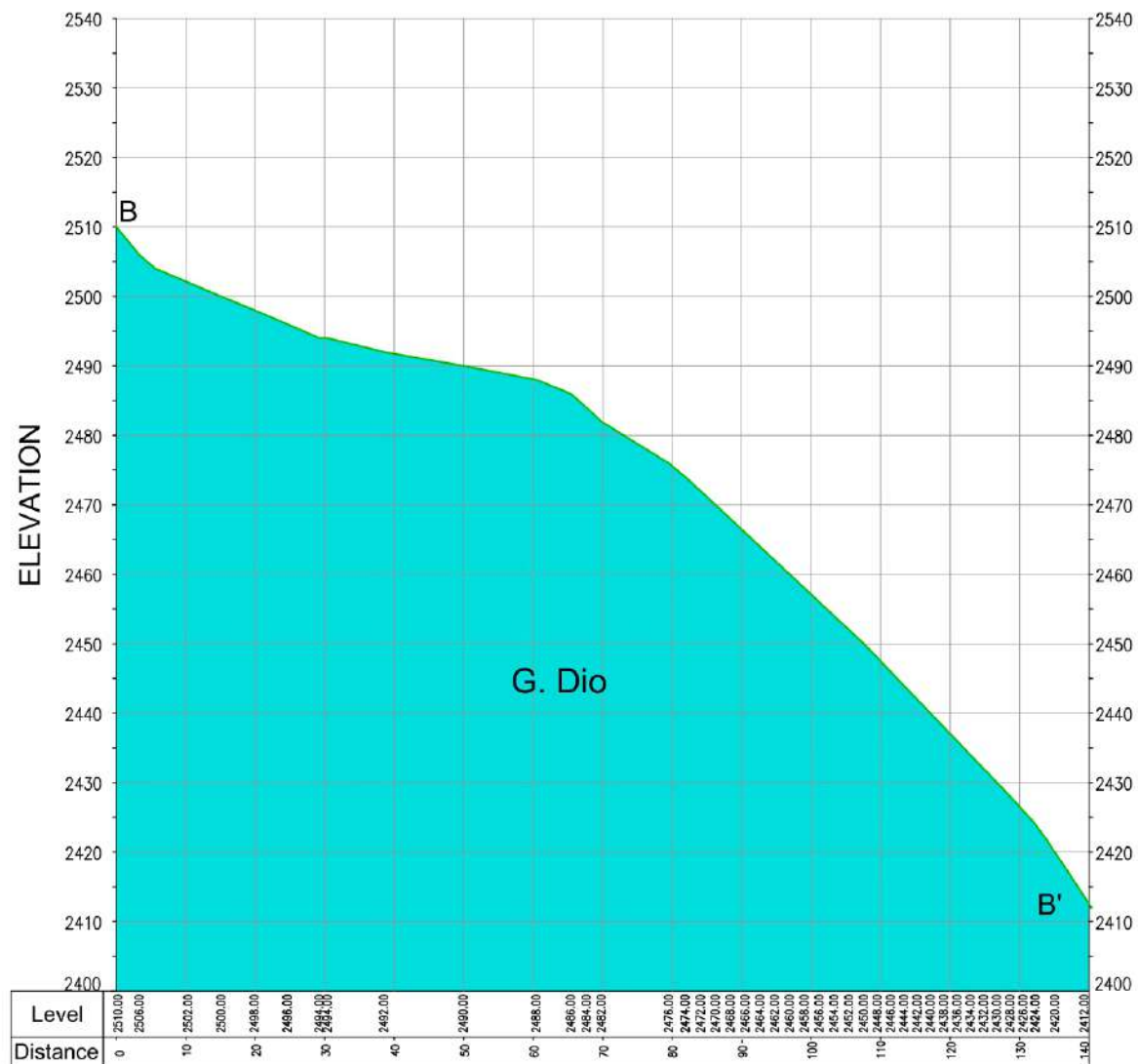




LEGEND

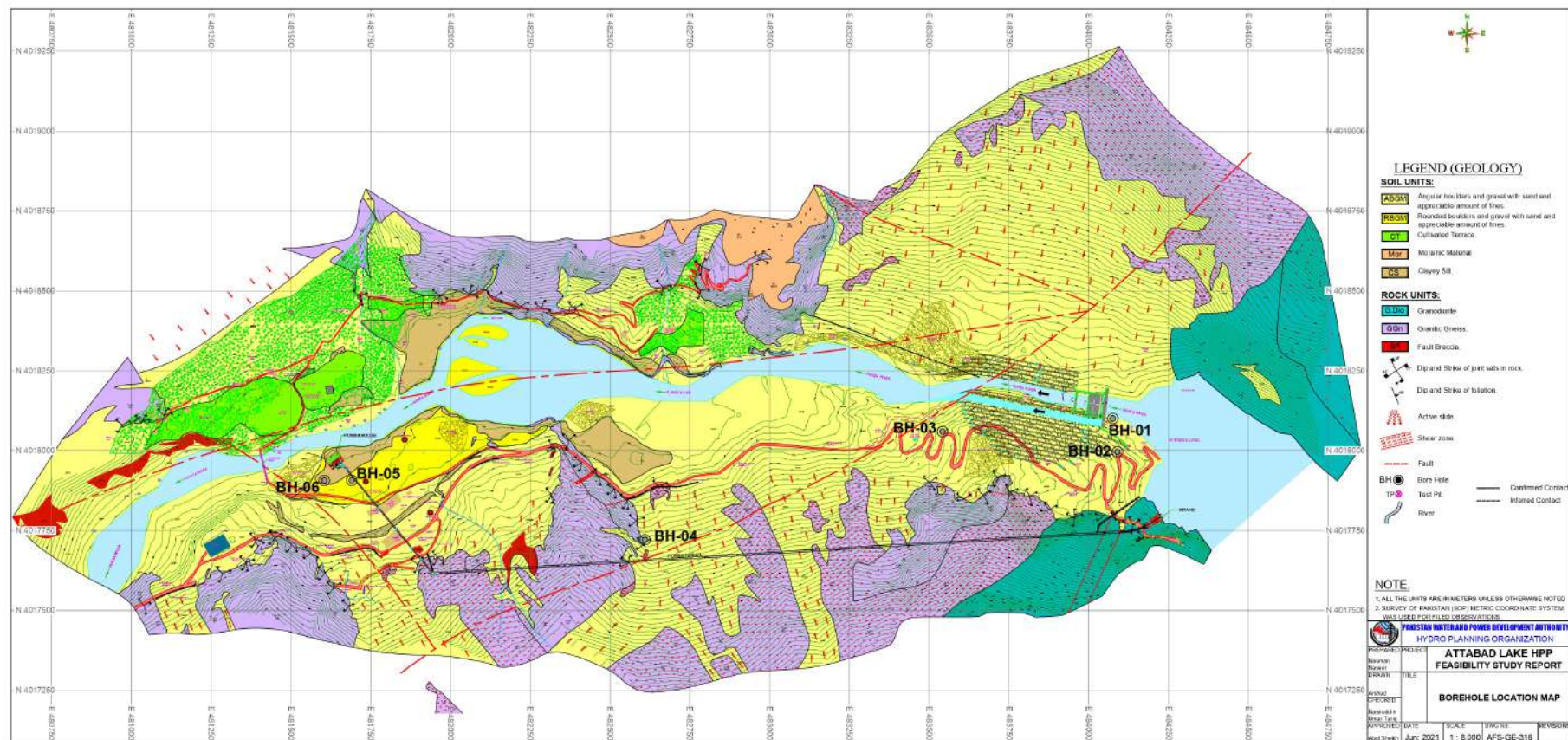
ROCK UNITS:

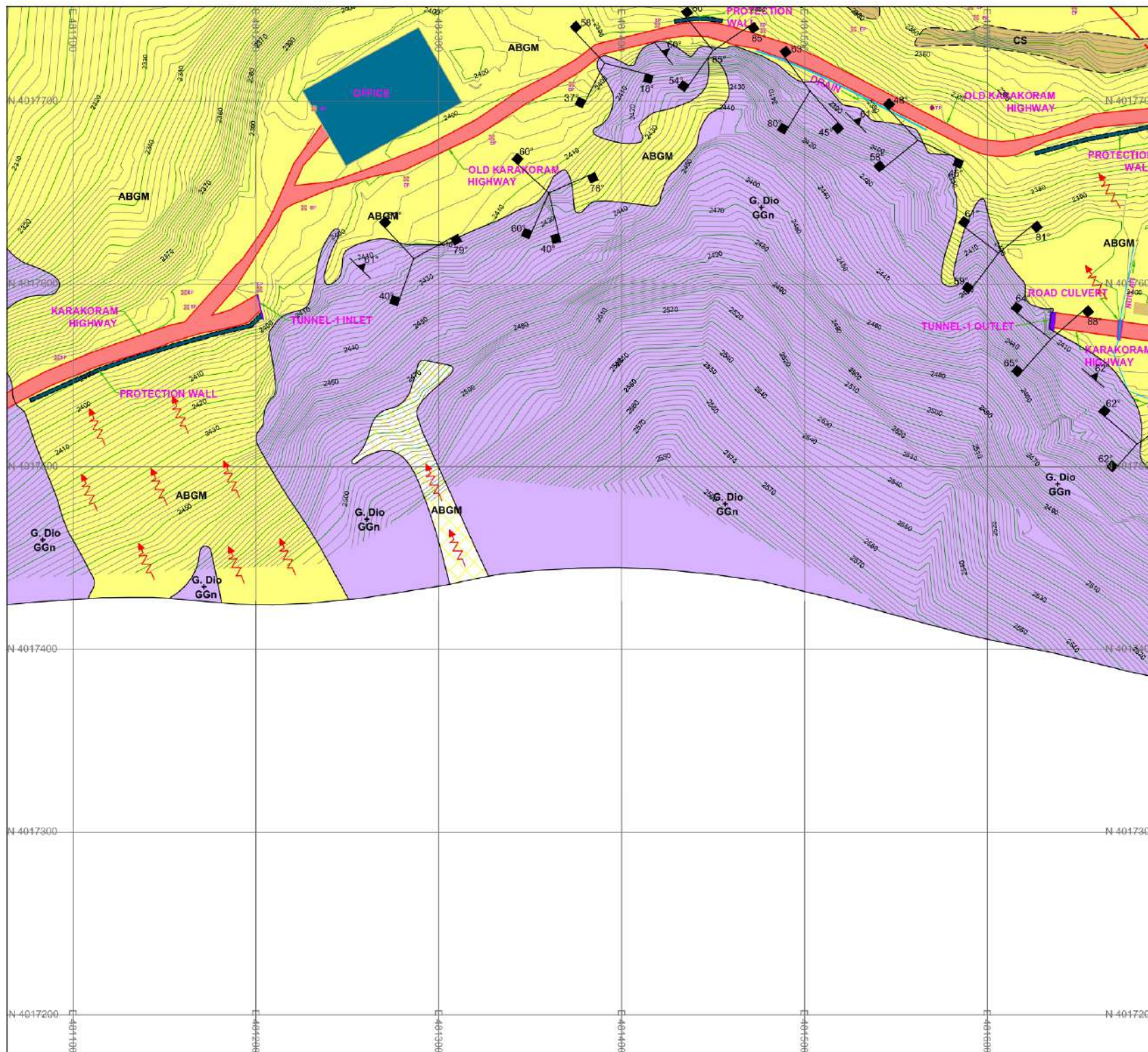
G. Dio Granodiorite

NOTE.

ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED.

	PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY HYDRO PLANNING ORGANIZATION			
	ATTABAD LAKE HPP FEASIBILITY STUDY REPORT			
PREPARED	PROJECT	GEOLOGICAL X-SECTION BB' INTAKE AREA		
Nauman				
Naseer		REVISIONS		
DRAWN	TITLE			
Arshad		1 : 750		
CHECKED				
Nasiruddin		AFS-GE-314		
Umar Tang				
APPROVED	DATE	Jun: 2021		
Abid Sheikh				





KEY PLAN:

				4	1
	16	13	10	7	
19	17	14	11	8	5
20	18	15	12	9	6
					3

LEGEND (GEOLOGY)

SOIL UNITS:

ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

G.Dio	Granodiorite
G.Dio + GGn	Granodiorite + Granitic Gneiss.
BR	Fault Breccia.
	Dip and Strike of joint sets in rock.
	Dip and Strike of foliation.
	Active slide.
	Shear zone.
	Fault
BH	Bore Hole.
TP	Test Pit.
	River
	Confirmed Contact
	Inferred Contact



NOTE.

- ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
- SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED PROJECT
Nauman
Naseer
DRAWN

ATTABAD LAKE HPP
FEASIBILITY STUDY REPORT

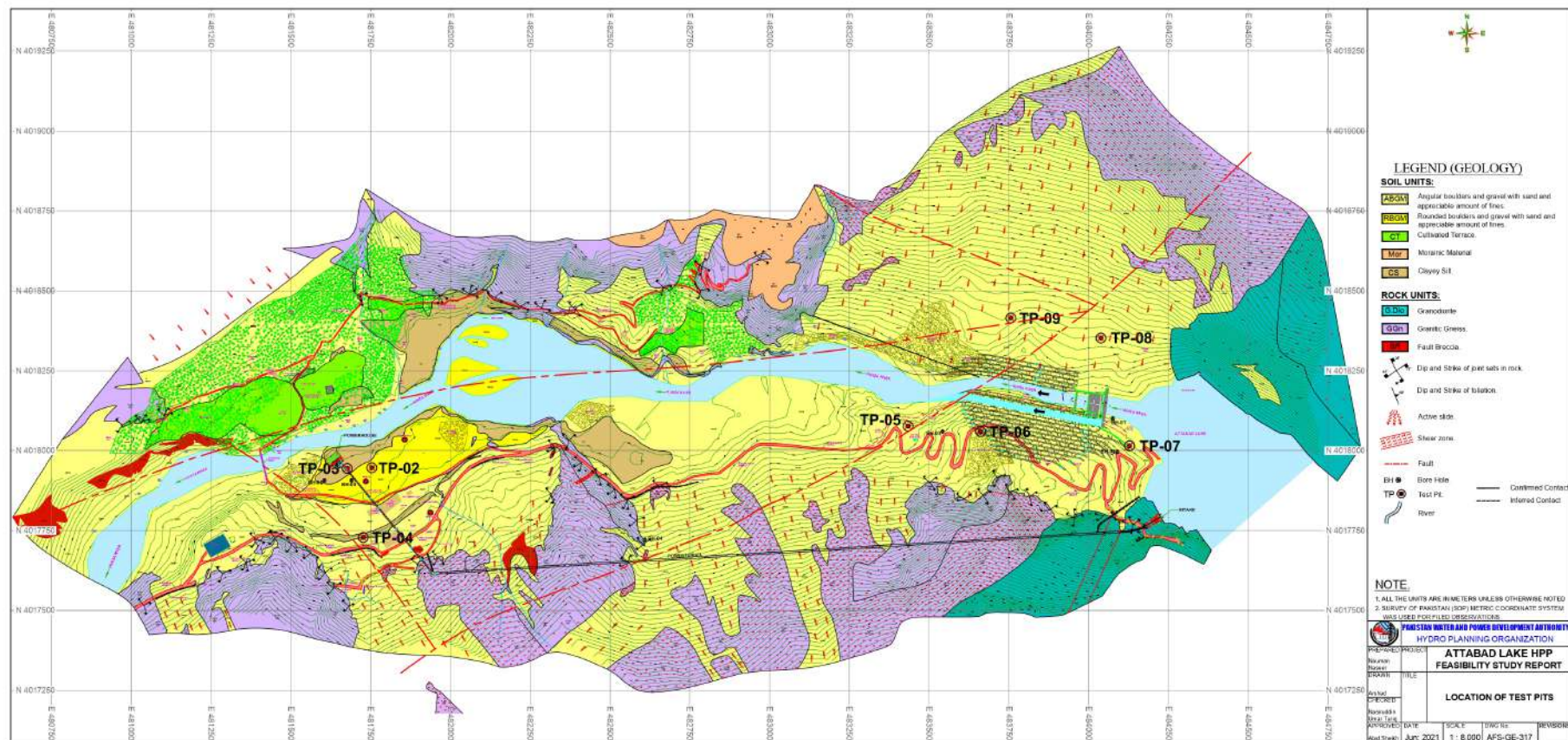
Arshad
CHECKED
Nasiruddin
Umar Tang
APPROVED

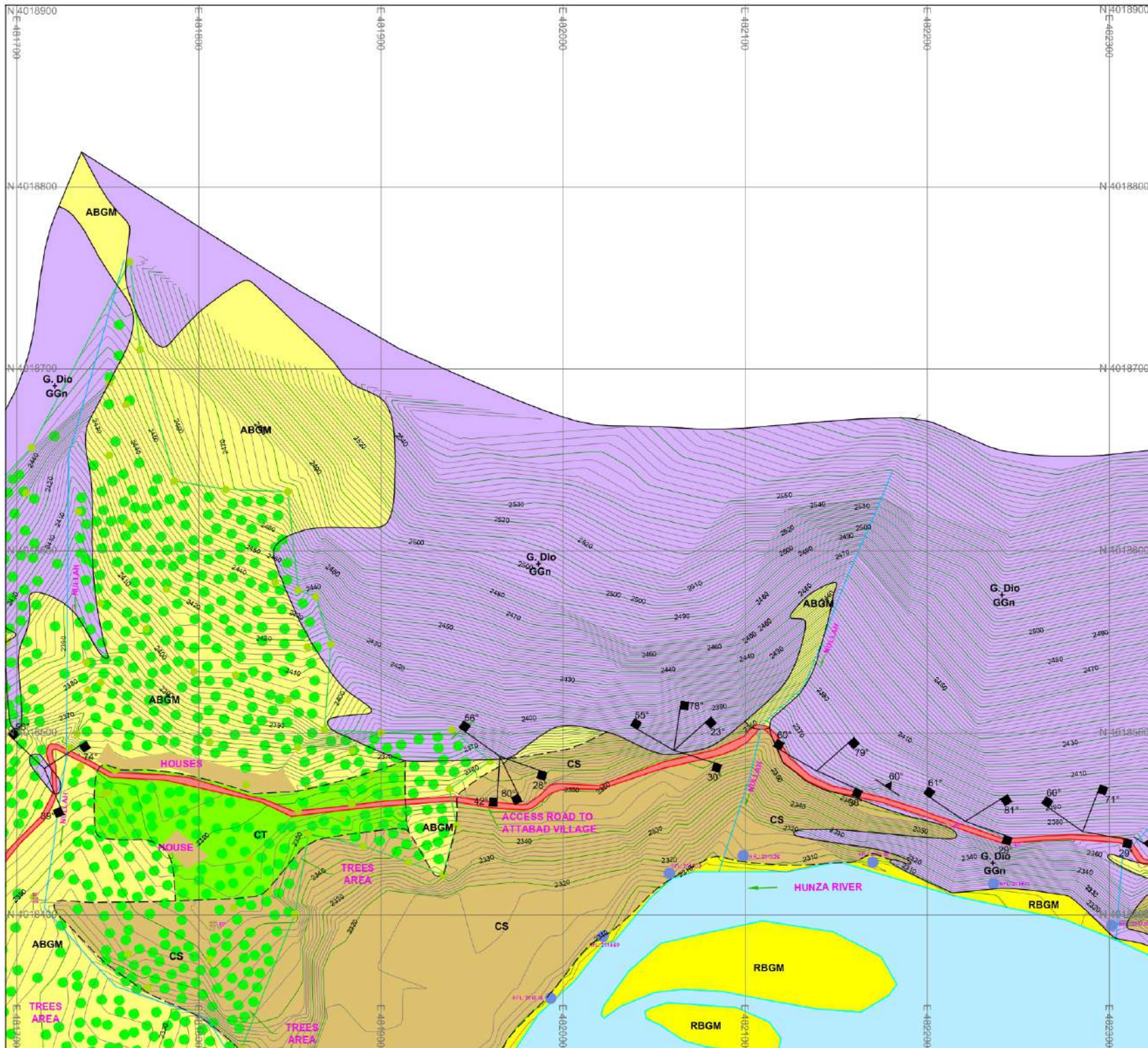
SURFACE GEOLOGICAL MAP

Sheet 18 of 20

Abid Sheikh

DATE: Jun: 2021
SCALE: 1 : 2,000
DWG No.: AFS-GE-310
REVISIONS:





KEY PLAN:

				4	1
	16	13	10	7	
19	17	14	11	8	5
20	18	15	12	9	6
					3

LEGEND (GEOLOGY)

SOIL UNITS:

ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

G.Dio	Granodiorite
G.Dio + GGn	Granodiorite + Granitic Gneiss.
BR	Fault Breccia.
	Dip and Strike of joint sets in rock.
	Dip and Strike of foliation.
	Active slide.
	Shear zone.
	Fault
	Bore Hole
	Test Pit
	River
	Confirmed Contact
	Inferred Contact



NOTE.

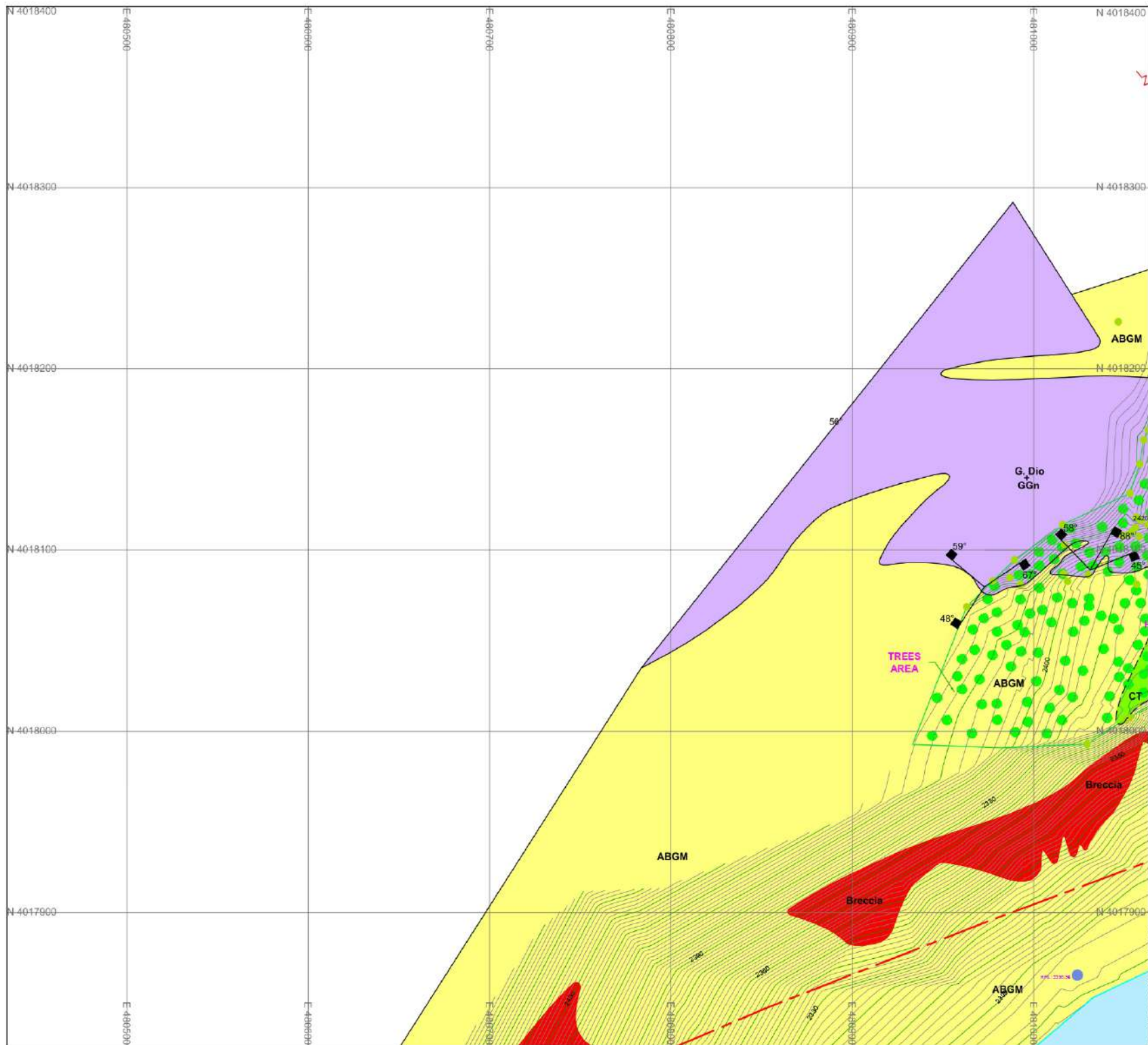
- ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
- SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED PROJECT
Nauman
Naseer
DRAWN
Arshad
CHECKED
Nasiruddin
Umar Tang
APPROVED
Abid Sheikh

ATTABAD LAKE HPP
FEASIBILITY STUDY REPORT
SURFACE GEOLOGICAL MAP
Sheet 13 of 20
DATE: Jun: 2021
SCALE: 1 : 2,000
DWG No.: AFS-GE-305
REVISIONS



KEY PLAN:

				4	1
	16	13	10	7	
	17	14	11	8	5
19	18	15	12	9	6
20					3

LEGEND (GEOLOGY)

SOIL UNITS:

ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

G.Dio	Granodiorite
G.Dio + GGn	Granodiorite + Granitic Gneiss.

BR Fault Breccia.

Dip and Strike of joint sets in rock.

Dip and Strike of foliation.

Active slide.

Shear zone.

Fault

Bore Hole.

Test Pit.

River

Confirmed Contact

Inferred Contact



NOTE.

1. ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
2. SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

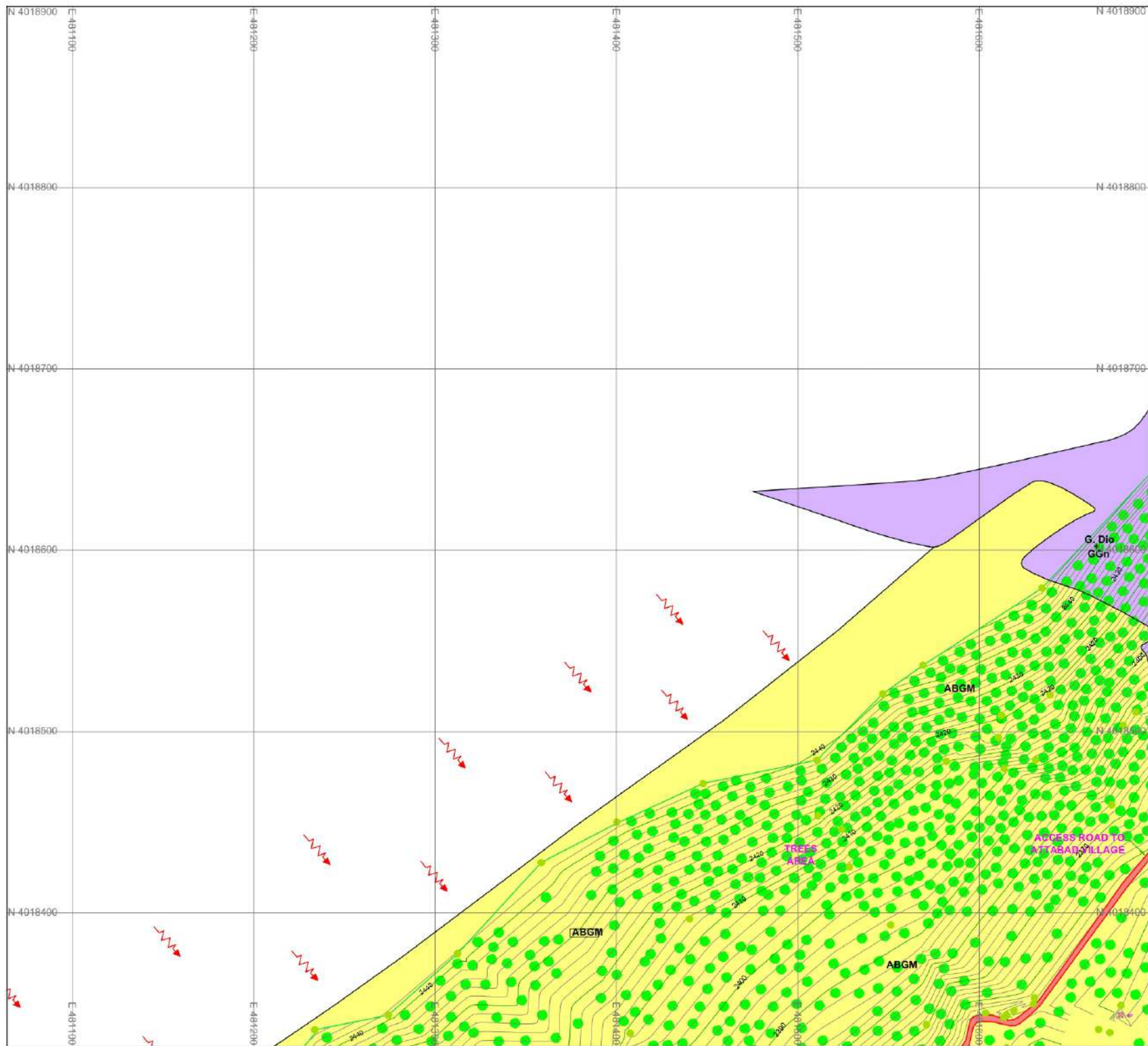
PREPARED BY
PROJECT
Nauman
Naseer
DRAWN
TITLE
Arshad
CHECKED
Nasiruddin
Umar Tang
APPROVED
Abid Sheikh

ATTABAD LAKE HPP
FEASIBILITY STUDY REPORT

SURFACE GEOLOGICAL MAP

Sheet 19 of 20

DATE	SCALE	DWG No.	REVISIONS
Jun: 2021	1 : 2,000	AFS-GE-311	



KEY PLAN:

				4	1
	16	13	10	7	
19	17	14	11	8	5
20	18	15	12	9	6
					3

LEGEND (GEOLOGY)

SOIL UNITS:

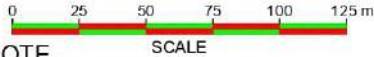
ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

G.Dio	Granodiorite
G.Dio + G.Gn	Granodiorite + Granitic Gneiss.

BR	Fault Breccia.
	Dip and Strike of joint sets in rock.
	Dip and Strike of foliation.

	Active slide.
	Shear zone.
	Fault
	Bore Hole.
	Test Pit.
	River
	Confirmed Contact
	Inferred Contact



NOTE.

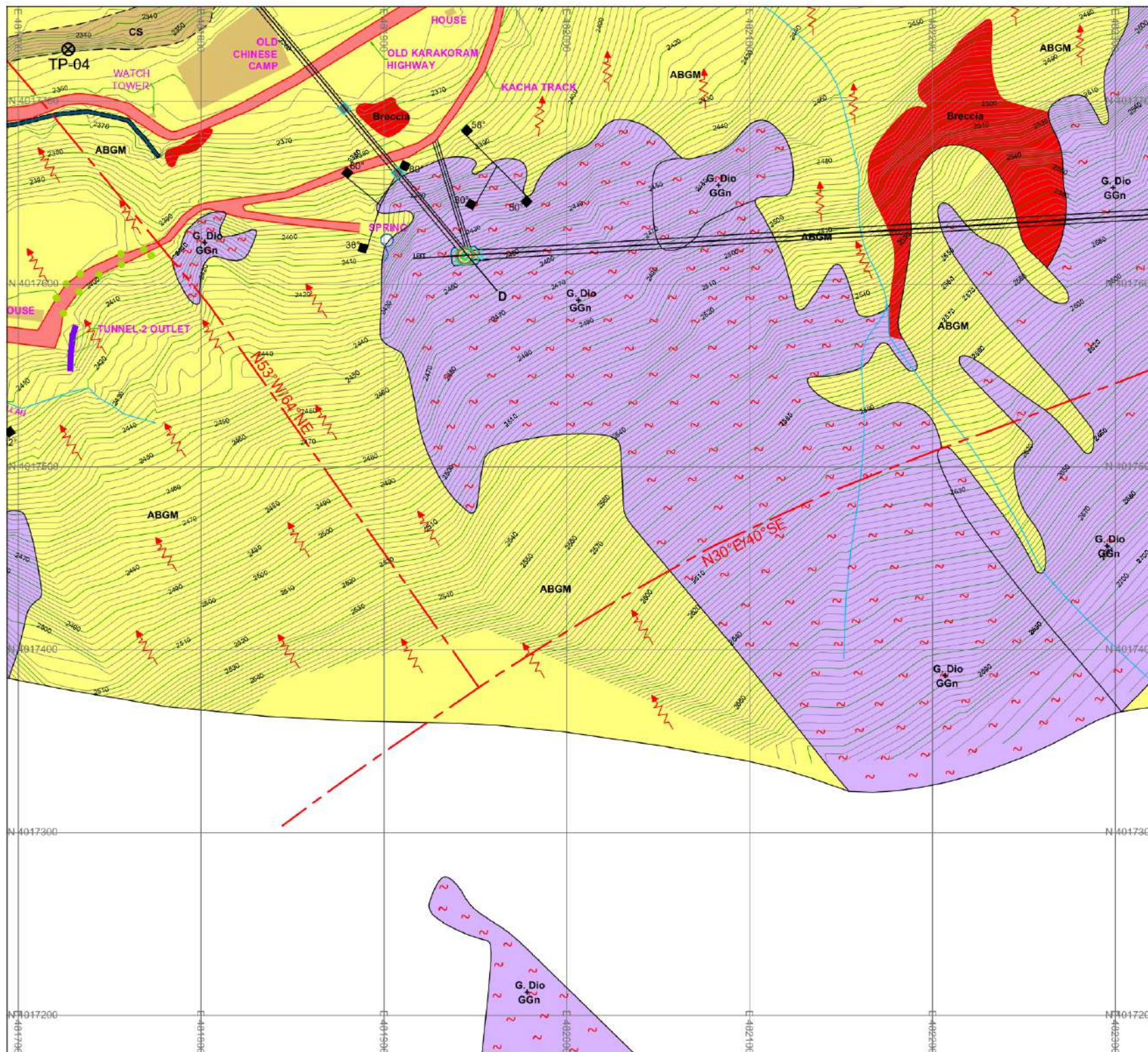
- 1. ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
- 2. SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED BY	PROJECT
Nauman Naseer	
DRAWN BY	TITLE
Arshad	
CHECKED BY	
Nasiruddin Umar Tang	
APPROVED BY	
Abid Sheikh	

ATTABAD LAKE HPP FEASIBILITY STUDY REPORT			
SURFACE GEOLOGICAL MAP			
Sheet 16 of 20			
DATE	SCALE	DWG No.	REVISIONS
Jun: 2021	1 : 2,000	AFS-GE-308	



KEY PLAN:

			4	1
16	13	10	7	5
19	17	14	11	8
20	18	15	12	9
			6	3

LEGEND (GEOLOGY)

SOIL UNITS:

ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

G. Dio	Granodiorite
G. Dio + GGn	Granodiorite + Granitic Gneiss.
BR	Fault Breccia.
	Dip and Strike of joint sets in rock.
	Dip and Strike of foliation.
	Active slide.
	Shear zone.
	Fault
	Bore Hole.
	Test Pit.
	River
	Confirmed Contact
	Inferred Contact

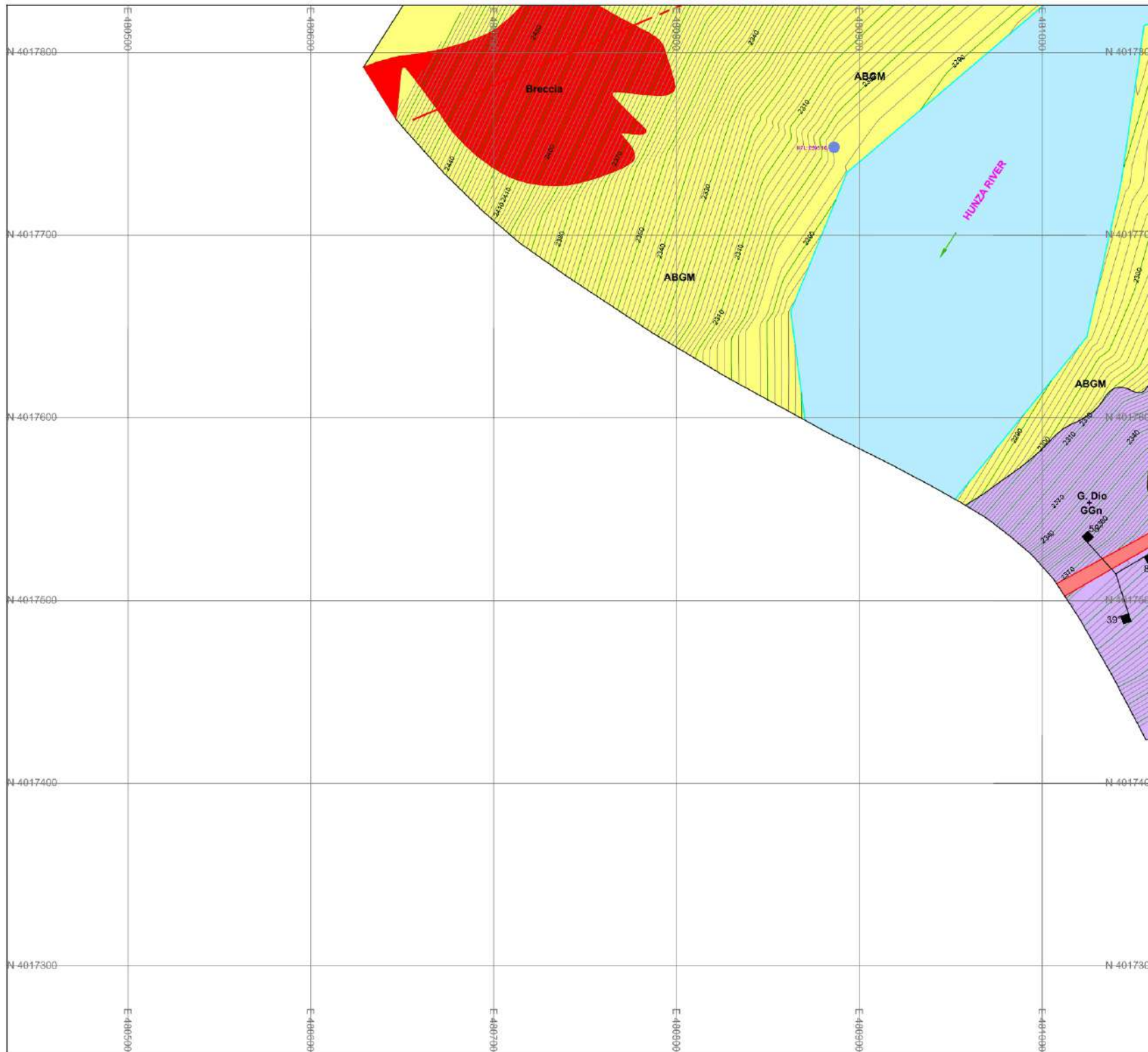
NOTE.

- ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
- SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED	PROJECT				ATTABAD LAKE HPP	
Nauman Naseer					FEASIBILITY STUDY REPORT	
DRAWN	TITLE				SURFACE GEOLOGICAL MAP	
Arshad						
CHECKED						
	Nasiruddin Umar Tang				Sheet 15 of 20	
APPROVED	DATE	SCALE	DWG No.		REVISIONS	
Abid Sheikh	Jun: 2021	1 : 2,000	AFS-GE-307			



KEY PLAN:

				4	1
	16	13	10	7	5
19	17	14	11	8	2
20	18	15	12	9	3

LEGEND (GEOLOGY)

SOIL UNITS:

ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

G.Dio	Granodiorite
G.Dio + GGn	Granodiorite + Granitic Gneiss.
BR	Fault Breccia.

Dip and Strike of joint sets in rock.

Dip and Strike of foliation.

Active slide.

Shear zone.

Fault

Bore Hole.

Test Pit.

River

Confirmed Contact

Inferred Contact



NOTE.

1. ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
2. SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED PROJECT

Nauman

Naseer

DRAWN TITLE

Arshad

CHECKED

Nasiruddin

Umar Tang

APPROVED

DATE

Jun: 2021

Abid Sheikh

ATTABAD LAKE HPP
FEASIBILITY STUDY REPORT

SURFACE GEOLOGICAL MAP

Sheet 20 of 20

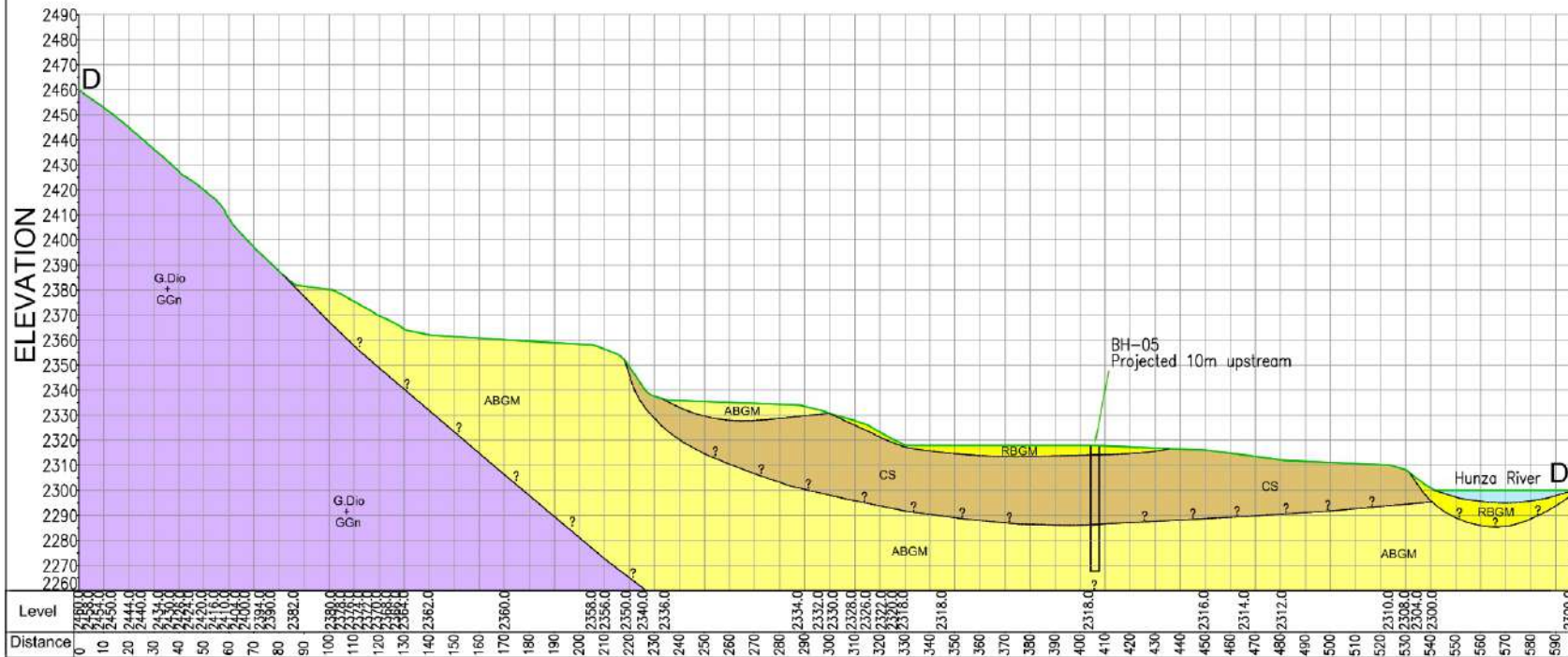
SCALE

1 : 2,000

DWG No.

AFS-GE-312

REVISIONS



LEGEND

SOIL UNITS:

- ABGM** Angular boulders and gravel with sand and appreciable amount of fines.
- RBGM** Rounded boulders and gravel with sand and appreciable amount of fines.
- CS** Clayey Silt

ROCK UNITS:

- G.Dio** Granodiorite + Granitic Gneiss

BH Bore Hole

Hunza River

NOTE.

ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED PROJECT
Nauman
Naseer

ATTABAD LAKE HPP
FEASIBILITY STUDY REPORT

DRAWN TITLE
Arshad
CHECKED
Nasiruddin
Umar Tang

GEOLOGICAL X-SECTION DD'
PENSTOCK & P/H AREA

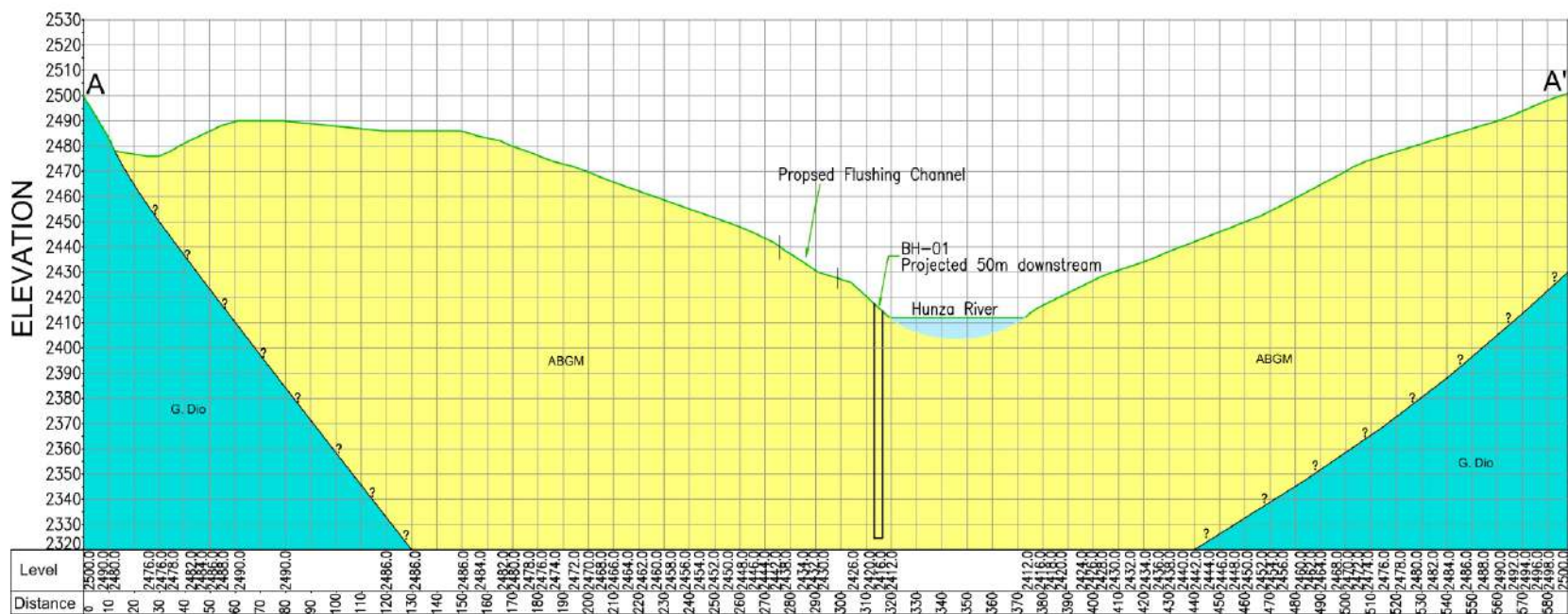
APPROVED
Abid Sheikh

DATE
Jun: 2021

SCALE
1 : 2000

DWG No.
AFS-GE-315

REVISIONS



LEGEND

SOIL UNITS:

ABGM Angular boulders and gravel with sand and appreciable amount of fines.

ROCK UNITS:

G. Dio Granodiorite

BH Bore Hole:

Hunza River

NOTE.

ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED

PROJECT

Nauman

ATTABAD LAKE HPP
FEASIBILITY STUDY REPORT

Naseer

DRAWN

TITLE

Arshad

GEOLOGICAL X-SECTION AA'
WEIR SITE

CHECKED

Nasiruddin

Umar Tang

APPROVED

DATE

Jun: 2021

SCALE

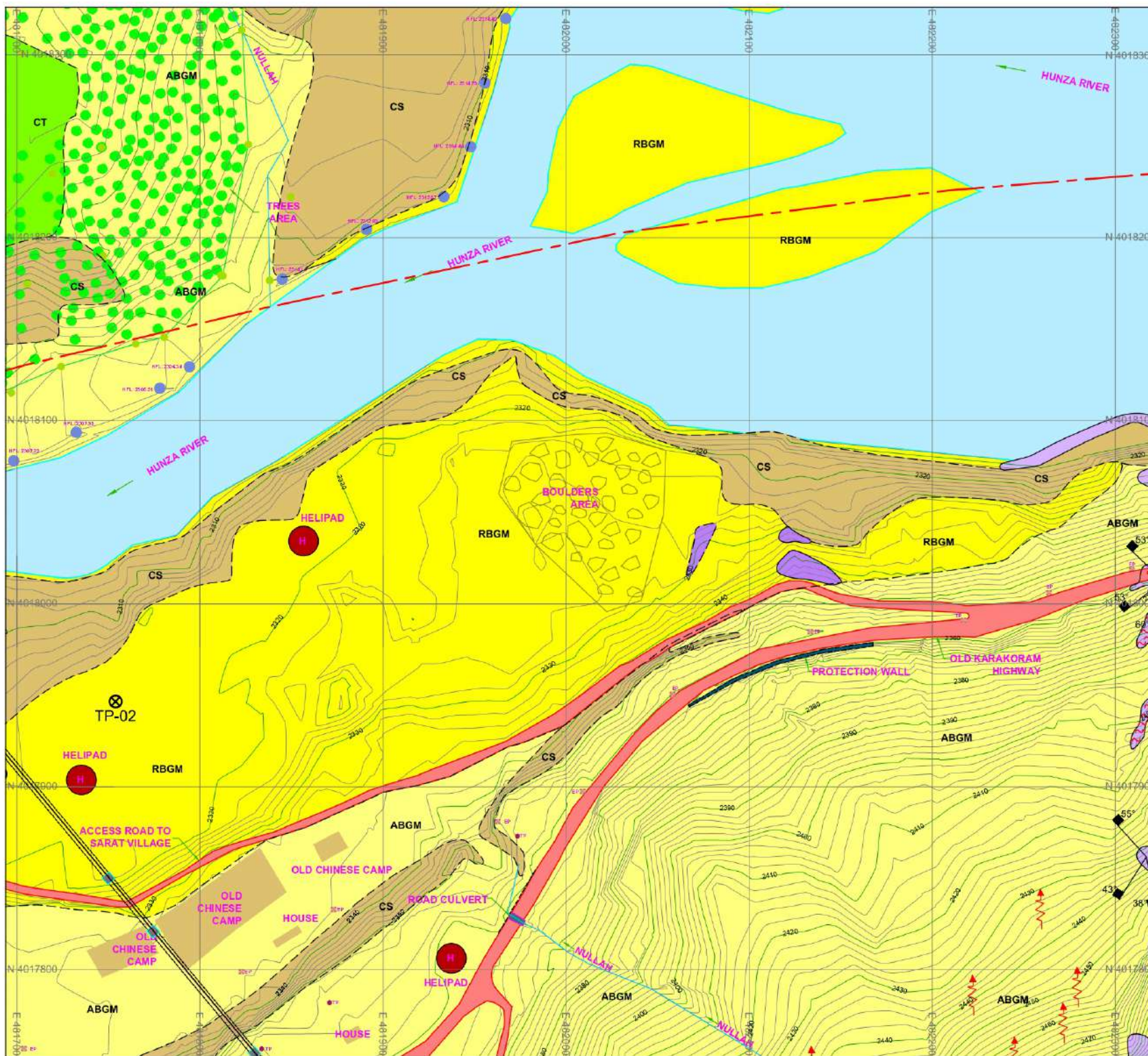
1 : 2000

DWG No.

AFS-GE-313

REVISIONS

Abid Sheikh



KEY PLAN:

				4	1
	16	13	10	7	
19	17	14	11	8	5
					6
20	18	15	12	9	3

LEGEND (GEOLOGY)

SOIL UNITS:

ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

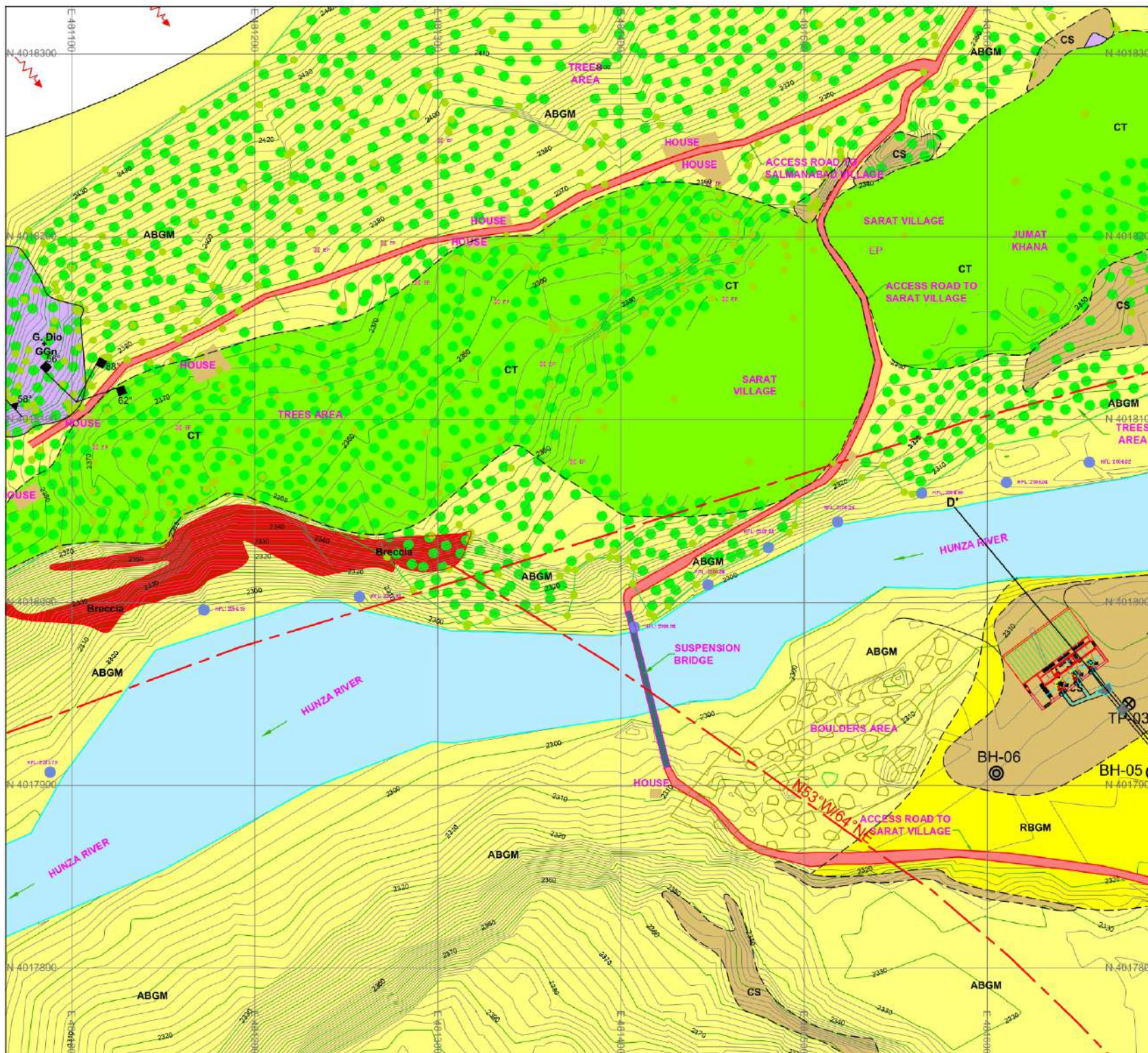
G.Dio	Granodiorite
G.Dio + G.Gn	Granodiorite + Granitic Gneiss.
BR	Fault Breccia.
	Dip and Strike of joint sets in rock.
	Dip and Strike of foliation.
	Active slide.
	Shear zone.
	Fault
	Bore Hole.
	Test Pit.
	River
	Confirmed Contact
	Inferred Contact

NOTE.

1. ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
2. SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.

PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED PROJECT	Nauman Naseer	ATTABAD LAKE HPP FEASIBILITY STUDY REPORT		
DRAWN	Arshad	TITLE		
CHECKED	Nasiruddin Umar Tangi	SURFACE GEOLOGICAL MAP		
APPROVED	Abid Sheikh	Sheet 14 of 20		
DATE	Jun: 2021	SCALE	DWG No.	REVISIONS
		1 : 2,000	AFS-GE-306	



KEY PLAN:

				4	1
	16	13	10	7	
19	17	14	11	8	5
	18	15	12	9	6
20					3

LEGEND (GEOLOGY)

SOIL UNITS:

ABGM	Angular boulders and gravel with sand and appreciable amount of fines.
RBGM	Rounded boulders and gravel with sand and appreciable amount of fines.
CT	Cultivated Terrace.
Mor	Morainic Material
CS	Clayey Silt.

ROCK UNITS:

G.Dio	Granodiorite
G.Dio + G.Gn	Granodiorite + Granitic Gneiss.

BR	Fault Breccia.
	Dip and Strike of joint sets in rock.
	Dip and Strike of foliation.

	Active slide.
	Shear zone.
	Fault
	Bore Hole.
	Test Pit.
	River
	Confirmed Contact
	Inferred Contact



NOTE.

1. ALL THE UNITS ARE IN METERS UNLESS OTHERWISE NOTED
2. SURVEY OF PAKISTAN (SOP) METRIC COORDINATE SYSTEM WAS USED FOR FIELD OBSERVATIONS.



PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY
HYDRO PLANNING ORGANIZATION

PREPARED PROJECT	ATTABAD LAKE HPP			
Nauman Naseer	FEASIBILITY STUDY REPORT			
DRAWN	TITLE	SURFACE GEOLOGICAL MAP		
Arshad	CHECKED	Sheet 17 of 20		
Nasiruddin	APPROVED	DATE	SCALE	DWG No.
Umar Tang	Abid Sheikh	Jun: 2021	1 : 2,000	AFS-GE-309
				REVISIONS