

Initial Environmental Examination

Annex (3c)
Project Number: 48404-004
July 2020

PAK: Central Asia Regional Economic Cooperation
Corridor Development Investment Program (Tranche 2)

Shikarpur–Rajanpur Section of N55

CURRENCY EQUIVALENTS

(as of 2 June 2020)

Currency unit	–	Pakistan Rupee/s (PRe/PRs)
PRe1.00	=	\$0.0061
\$1.00	=	PRs164.25

UNIT CONVERSIONS

1 gallon	–	3.785 liter
1 gallon/day	–	0.00455 m ³ /day
1 m ³ /day	–	0.041 m ³ /hour
1 cusec	–	28.31 liters
1 kilometer	–	1,000 meters
1 foot	–	12 inches
1 acre	–	4,046.8 meter ²

ABBREVIATIONS

AAD	–	average annual daily
AADT	–	average annual daily traffic
AASHTO	–	American Association of State Highway and Transportation
AASHTO ASM	–	American Association of State Highway and Transportation Officials
ABC	–	aggregate base course
ACBC	–	asphaltic concrete base course
ACW	–	additional carriageway
ACWC	–	asphaltic concrete wearing course
ADB	–	Asian Development Bank
AKM	–	avenue kilometer
APHA	–	American Public Health Association
AP	–	affected person
ASR	–	air sensitive receiver
ASTM	–	American Society of Testing Materials
BDL	–	below detection limit
BHU	–	basic health unit
BOD	–	bio-chemical oxygen demand
BP	–	Bank Policy
°C	–	degree Centigrade/Celsius
CAREC	–	Central Asia Regional Economic Corridor
CC	–	construction contractor
CO	–	carbon monoxide
COD	–	chemical oxygen demand
CSR	–	composite schedule rates

dB (A)	–	decibel
DCR	–	district census report
DC	–	design consultant
DD	–	deputy director
DMC	–	developing member countries
DO	–	dissolved oxygen
EA	–	environmental assessment
EE	–	environmental engineer
EIA	–	environmental impact assessment
EMP	–	environmental management plan
EPA	–	Environment Protection Agency
EPD	–	Environment Protection Department
EPO	–	Environmental Protection Ordinance
ESR	–	Environmental Sensitive Receiver
FCC	–	Forest Conservation Committee
FI	–	financial intermediary
GHG	–	greenhouse gas
GOP	–	Government of Pakistan
GRC	–	grievance redress committee
GRM	–	grievance redress mechanism
HSIP	–	Highway Sector Improvement Program
IEE	–	initial environmental examination
ILO	–	International Labor Organization
km	–	kilometer
kph	–	kilometer per hour
LAC	–	land acquisition collector
LAeq	–	equivalent continuous sound level, 'A weighting' = correction by factors that weight sound to correlate with the sensitivity of the human ear to sounds at different frequencies
m	–	meter
MFF	–	multitranchise financing facility
MGDs	–	Millennium Development Goals
MVE	–	motor vehicle examiner
NEQS	–	National Environmental Quality Standards
NESPAK	–	National Engineering Services Pakistan
NGO	–	nongovernment organization
NHA	–	National Highways Authority
NO	–	nitrogen oxide
NOC	–	no-objection certificate
NSL	–	natural surface level
NSR	–	noise sensitive receiver
NTC	–	National Trade Corridor
OP	–	operational policy
OSHA	–	Occupational Safety and Health Administration
PAP	–	project affected person
PEPA	–	Pakistan Environmental Protection Act
PEPC	–	Pakistan Environmental Protection Council
PM	–	particulate matter
PNCS	–	Pakistan National Conservation Strategy
POP	–	persistent organic pollutant

PPAF	–	Pakistan Poverty Alleviation Fund
PPC	–	Pakistan Penal Code
PRC	–	People’s Republic of China
RE	–	resident engineer
REA	–	rapid environmental assessment
ROW	–	right-of-way
SC	–	supervision consultant
SMART	–	self-monitoring and reporting tool
SO	–	sulfur oxide
SPS	–	Safeguard Policy Statement
SSEMP	–	site specific environmental management plan
TA	–	technical assistance
TOR	–	terms of reference
TSS	–	total suspended solids
UBC	–	Uniform Building Code
UC	–	Union Council
UNFCCC	–	United Nations Framework Convention on Climate Change
USEPA	–	United States Environmental Protection Agency
WHO	–	World Health Organization

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WATER ANALYSIS REPORT

Reference Number	KS-P/ENV/01-787-2020	Site Address:	Khanpur, District Shikarpur
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	04-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Ground Water		
Location:	Niaz Hussain Jatoi		
GPS Coordinates:	28° 5' 13.150" N 68° 57' 32.143" E		

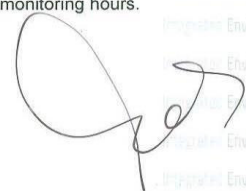
Sr. No.	Parameters	Analysis Method	Units	SEQS	Results
1	pH	APHA-4500H+ B	--	6.5-8.5	6.9
2	Taste & Odor	In-house	--	Non Objectionable	Non Objectionable
3	Color	APHA-2120 B/C	TCU	<15	5
4	Turbidity	APHA-2130 B	NTU	<5	3
5	Total Coliform	APHA:9222 B	Number/100 mL	0 Number/100 mL	0
6	E-Coli	APHA:9222 D	Number/100 mL	0 Number/100 mL	0
7	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	<1000	289
8	Total Hardness	APHA-2340 C	mg/L	<500	59
9	Nitrate	APHA-4500NO3 B	mg/L	≤50	3.3
10	Nitrite	APHA-4500NO2 B	mg/L	≤3	0.0054
11	Ammonia	APHA-4500-NH3-B	mg/L	---	0.057
12	Arsenic	APHA-3500As B	mg/L	<0.05	N.D.
13	Antimony	APHA-3500Sb B	mg/L	<0.005	N.D.
14	Barium	APHA-3500Ba B	mg/L	0.7	N.D.
15	Chloride	APHA-4500Cl- B	mg/L	250	56
16	Fluoride	APHA-4500F- C	mg/L	<1.5	0.84

SEQS: Sindh Environmental Quality Standards for Drinking Water N.D: Not Detected
Note:

- Selected measurement units were mg/L otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.



Signature of Analyst:



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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WATER ANALYSIS REPORT

Reference Number	KS-P/ENV/01-787-2020	Site Address:	Kashmore, District Kashmore
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	05-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Ground Water		
Location:	Kashmore		
GPS Coordinates:	28° 26' 2.617" N 69° 34' 33.757" E		

Sr. No.	Parameters	Analysis Method	Units	SEQS	Results
1	pH	APHA-4500H+ B	--	6.5-8.5	6.1
2	Taste & Odor	In-house	--	Non Objectionable	salted
3	Color	APHA-2120 B/C	TCU	<15	11
4	Turbidity	APHA-2130 B	NTU	<5	7
5	Total Coliform	APHA:9222 B	Number/100 mL	0 Number/100 mL	0
6	E-Coli	APHA:9222 D	Number/100 mL	0 Number/100 mL	0
7	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	<1000	1068
8	Total Hardness	APHA-2340 C	mg/L	<500	122
9	Nitrate	APHA-4500NO3 B	mg/L	≤50	6.7
10	Nitrite	APHA-4500NO2 B	mg/L	≤3	0.91
11	Ammonia	APHA-4500-NH3-B	mg/L	---	1.8
12	Arsenic	APHA-3500As B	mg/L	<0.05	N.D.
13	Antimony	APHA-3500Sb B	mg/L	<0.005	N.D.
14	Barium	APHA-3500Ba B	mg/L	0.7	N.D.
15	Chloride	APHA-4500Cl- B	mg/L	250	202
16	Fluoride	APHA-4500F- C	mg/L	<1.5	0.98

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WATER ANALYSIS REPORT

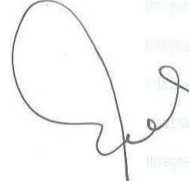
Reference Number	KS-P/ENV/01-787-2020	Site Address:	Rojhan, District Rahim Yar Khan
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	06-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Ground Water		
Location:	Rojhan		
GPS Coordinates:	28° 42' 55.473" N 69° 54' 1.071" E		

Sr. No.	Parameters	Analysis Method	Units	PEQS	Results
1	pH	APHA-4500H+ B	--	6.5-8.5	6.8
2	Taste & Odor	In-house	--	Non Objectionable	Non Objectionable
3	Color	APHA-2120 B/C	TCU	<15	6
4	Turbidity	APHA-2130 B	NTU	<5	5
5	Total Coliform	APHA:9222 B	Number/100 mL	0 Number/100 mL	0
6	E-Coli	APHA:9222 D	Number/100 mL	0 Number/100 mL	0
7	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	<1000	372
8	Total Hardness	APHA-2340 C	mg/L	<500	94
9	Nitrate	APHA-4500NO3 B	mg/L	≤50	4.1
10	Nitrite	APHA-4500NO2 B	mg/L	≤3	0.09
11	Ammonia	APHA-4500-NH3-B	mg/L	---	0.083
12	Arsenic	APHA-3500As B	mg/L	<0.05	N.D.
13	Antimony	APHA-3500Sb B	mg/L	<0.005	N.D.
14	Barium	APHA-3500Ba B	mg/L	0.7	N.D.
15	Chloride	APHA-4500Cl- B	mg/L	250	72
16	Fluoride	APHA-4500F- C	mg/L	<1.5	0.91

PEQS: Punjab Environmental Quality Standards for Drinking Water N.D: Not Detected
Note:

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WATER ANALYSIS REPORT

Reference Number	KS-P/ENV/01-787-2020	Site Address:	Rajanpur, District Rahim Yar Khan
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	08-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Ground Water		
Location:	Rajanpur		
GPS Coordinates:	29° 05' 14.150" N 70° 19' 30.944" E		

Sr. No.	Parameters	Analysis Method	Units	PEQS	Results
1	pH	APHA-4500H+ B	--	6.5-8.5	6.4
2	Taste & Odor	In-house	--	Non Objectionable	Salted
3	Color	APHA-2120 B/C	TCU	<15	9
4	Turbidity	APHA-2130 B	NTU	<5	6
5	Total Coliform	APHA:9222 B	Number/100 mL	0 Number/100 mL	0
6	E-Coli	APHA:9222 D	Number/100 mL	0 Number/100 mL	0
7	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	<1000	1094
8	Total Hardness	APHA-2340 C	mg/L	<500	267
9	Nitrate	APHA-4500NO3 B	mg/L	≤50	7.6
10	Nitrite	APHA-4500NO2 B	mg/L	≤3	0.85
11	Ammonia	APHA-4500-NH3-B	mg/L	---	1.94
12	Arsenic	APHA-3500As B	mg/L	<0.05	N.D.
13	Antimony	APHA-3500Sb B	mg/L	<0.005	N.D.
14	Barium	APHA-3500Ba B	mg/L	0.7	N.D.
15	Chloride	APHA-4500Cl- B	mg/L	250	194
16	Fluoride	APHA-4500F- C	mg/L	<1.5	1.1

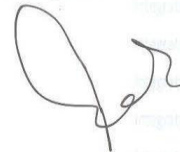
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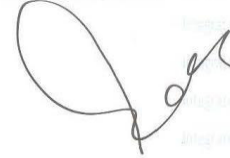
Reference Number	KS-P/ENV/01-787-2020	Site Address:	Khanpur, District Shikarpur
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	04-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Surface / Wastewater		
Location:	Niaz Hussain Jatol		
GPS Coordinates:	28° 3' 46.240" N 68° 54' 49.258" E		

Sr. No.	Parameters	Analysis Method	Units	SEQS	Results
1	Temperature	--	°C	40	18
2	pH	APHA-4500H+ B	---	6-9	7.9
3	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	3500	2130
4	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/L	150	103
5	Biological Oxygen Demand (BOD ₅) at 20 °C	APHA, 5210	mg/L	80	76
6	Phenolic Compounds as Phenols	APHA-5530 D	mg/L	0.1	0.003
7	Chloride (Cl ⁻)	APHA-4500Cl- B	mg/L	1000	110
8	Copper (Cu ⁺)	APHA-3500Cu B	mg/L	1.0	0.040
9	Total Iron (Fe ⁺)	APHA-3500-Fe-B	mg/L	8.0	0.25
10	Lead (Pb ⁺)	APHA-3500-Pb B	mg/L	0.5	N.D.
11	Manganese	APHA-3500-Mn B	mg/L	1.5	0.037
12	Sulfate (SO ₄)	APHA-4500-SO4C	mg/L	600	114
13	Zinc (Zn)	APHA-3500-Zn B	mg/L	5.0	0.089
14	Silver	APHA-3500Ag-B	mg/L	1.0	0.02
15	Boron	APHA-4500B-C	mg/L	6.0	0.07
16	Barium	APHA-3500Ba B	mg/L	1.5	0.06

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Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	04-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Surface / Wastewater		
Location:	Niaz Hussain Jatoi		
GPS Coordinates:	28° 4' 57.062" N 68° 57' 27.422" E		

Sr. No.	Parameters	Analysis Method	Units	SEQS	Results
1	Temperature	--	°C	40	16
2	pH	APHA-4500H+ B	---	6-9	7.8
3	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	3500	1934
4	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/L	150	127
5	Biological Oxygen Demand (BOD ₅) at 20 °C	APHA, 5210	mg/L	80	83
6	Phenolic Compounds as Phenols	APHA-5530 D	mg/L	0.1	0.07
7	Chloride (Cl ⁻)	APHA-4500Cl- B	mg/L	1000	129
8	Copper (Cu ⁺)	APHA-3500Cu B	mg/L	1.0	0.41
9	Total Iron (Fe ⁺)	APHA-3500-Fe-B	mg/L	8.0	0.33
10	Lead (Pb ⁺)	APHA-3500-Pb B	mg/L	0.5	N.D.
11	Manganese	APHA-3500-Mn B	mg/L	1.5	0.046
12	Sulfate (SO ₄)	APHA-4500-SO4C	mg/L	600	122
13	Zinc (Zn)	APHA-3500-Zn B	mg/L	5.0	0.092
14	Silver	APHA-3500Ag-B	mg/L	1.0	0.04
15	Boron	APHA-4500B-C	mg/L	6.0	0.08
16	Barium	APHA-3500Ba B	mg/L	1.5	0.056

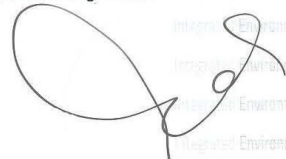
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Reference Number	KS-P/ENV/01-787-2020	Site Address:	Kund Kot, District Kashmore
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	04-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Surface / Wastewater		
Location:	Khandh Kot		
GPS Coordinates:	28° 13' 39.558" N 69° 10' 37.332" E		

Sr. No.	Parameters	Analysis Method	Units	SEQS	Results
1	Temperature	--	°C	40	18
2	pH	APHA-4500H+ B	---	6-9	8.1
3	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	3500	2371
4	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/L	150	116
5	Biological Oxygen Demand (BOD ₅) at 20 °C	APHA, 5210	mg/L	80	79
6	Phenolic Compounds as Phenols	APHA-5530 D	mg/L	0.1	0.09
7	Chloride (Cl ⁻)	APHA-4500Cl- B	mg/L	1000	136
8	Copper (Cu ⁺)	APHA-3500Cu B	mg/L	1.0	0.53
9	Total Iron (Fe ⁺)	APHA-3500-Fe-B	mg/L	8.0	0.81
10	Lead (Pb ⁺)	APHA-3500-Pb B	mg/L	0.5	N.D.
11	Manganese	APHA-3500-Mn B	mg/L	1.5	0.051
12	Sulfate (SO ₄)	APHA-4500-SO4C	mg/L	600	142
13	Zinc (Zn)	APHA-3500-Zn B	mg/L	5.0	0.08
14	Silver	APHA-3500Ag-B	mg/L	1.0	0.06
15	Boron	APHA-4500B-C	mg/L	6.0	0.16
16	Barium	APHA-3500Ba B	mg/L	1.5	0.049

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Reference Number	KS-P/ENV/01-787-2020	Site Address:	Bakshapur, District Kashmore
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	04-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Surface / Wastewater		
Location:	Bakshapur		
GPS Coordinates:	28° 21' 2.623" N 69° 22' 35.950" E		

Sr. No.	Parameters	Analysis Method	Units	SEQS	Results
1	Temperature	--	°C	40	16
2	pH	APHA-4500H+ B	---	6-9	7.9
3	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	3500	2087
4	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/L	150	128
5	Biological Oxygen Demand (BOD ₅) at 20 °C	APHA, 5210	mg/L	80	81
6	Phenolic Compounds as Phenols	APHA-5530 D	mg/L	0.1	0.06
7	Chloride (Cl)	APHA-4500Cl- B	mg/L	1000	149
8	Copper (Cu ⁺)	APHA-3500Cu B	mg/L	1.0	0.51
9	Total Iron (Fe ⁺)	APHA-3500-Fe-B	mg/L	8.0	0.73
10	Lead (Pb ⁺)	APHA-3500-Pb B	mg/L	0.5	N.D.
11	Manganese	APHA-3500-Mn B	mg/L	1.5	0.067
12	Sulfate (SO ₄)	APHA-4500-SO4C	mg/L	600	162
13	Zinc (Zn)	APHA-3500-Zn B	mg/L	5.0	0.09
14	Silver	APHA-3500Ag-B	mg/L	1.0	0.05
15	Boron	APHA-4500B-C	mg/L	6.0	0.08
16	Barium	APHA-3500Ba B	mg/L	1.5	0.026

SEQS: Sindh Environmental Quality Standards for municipal Effluents N.D: Not Detected

Note:

- Selected measurement units were mg/L otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.



Signature of Analyst:



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Environmental Protection Agency (EPA-KPK) Certified

WATER ANALYSIS REPORT

Reference Number	KS-P/ENV/01-787-2020	Site Address:	Bakshapur, District Kashmir
Project Name:	Shikarpur-Rajanpur Road Section Project (N55)	Reporting Date:	13-07-2020
Sampling Date:	04-07-2020	Monitoring Method:	APHA/USEPA Standard Methods
Source:	Surface / Wastewater		
Location:	Bakshapur		
GPS Coordinates:	28° 25' 35.551" N 69° 28' 22.012" E		

Sr. No.	Parameters	Analysis Method	Units	SEQS	Results
1	Temperature	--	°C	40	15
2	pH	APHA-4500H+ B	---	6-9	7.8
3	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	3500	1993
4	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/L	150	124
5	Biological Oxygen Demand (BOD ₅) at 20 °C	APHA, 5210	mg/L	80	76
6	Phenolic Compounds as Phenols	APHA-5530 D	mg/L	0.1	0.09
7	Chloride (Cl ⁻)	APHA-4500Cl- B	mg/L	1000	143
8	Copper (Cu ⁺)	APHA-3500Cu B	mg/L	1.0	0.67
9	Total Iron (Fe ⁺)	APHA-3500-Fe-B	mg/L	8.0	0.82
10	Lead (Pb ⁺)	APHA-3500-Pb B	mg/L	0.5	N.D.
11	Manganese	APHA-3500-Mn B	mg/L	1.5	0.073
12	Sulfate (SO ₄)	APHA-4500-SO4C	mg/L	600	192
13	Zinc (Zn)	APHA-3500-Zn B	mg/L	5.0	0.6
14	Silver	APHA-3500Ag-B	mg/L	1.0	0.12
15	Boron	APHA-4500B-C	mg/L	6.0	0.08
16	Barium	APHA-3500Ba B	mg/L	1.5	0.034

SEQS: Sindh Environmental Quality Standards for municipal Effluents N.D: Not Detected

Note:

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