“AzerEnerji” JSC

Azerbaijan Scaling-Up Renewable Energy Project (AZURE Project)

Project number: P505208

Environmental and Social Impact Assessment Report

Part 1: Main Report

Client: **“AzerEnerji” JSC**

Prepared: **“IQLIM LTD” LLC**

Status: **Draft**

Date: **23.10.2024**

Revised: **25.01.2025**

TABLE OF CONTENTS

LIST OF ABBREVIATIONS		13
1.	INTRODUCTION	16
1.1	Purpose of the ESIA Report	16
1.2	ESIA Scope and Methodology	16
1.3	ESIA Programme	18
1.4	ESIA Team	23
1.5	Overview of the Project	24
1.6	Legal and Institutional Framework	28
1.7	ESIA Study Components	28
1.8	Limitations of the Approach to ESIA	28
1.9	Report Structure	28
2	PROJECT DESCRIPTION	29
2.1	Project Background and Objectives	29
2.2	Description of the WB-Funded Project Components	33
2.2.1	OHLs	34
2.2.2	Other Facilities	40
2.3	Description of project activities	43
2.3.1	Social and transport implications	43
2.3.2	Land clearing and excavation	45
2.3.3	Vehicles and equipment	46
2.3.4	Water management	47
2.3.5	Labour, schedule and working conditions	47
2.3.6	Emergency response	51
2.3.7	Community interaction	51
2.4	Potential Interference of the Project Components with Sensitive Impact receptors	52
2.4.1	500kV Transmission Lines	52
2.4.2	330 kV Transmission Line	53
2.4.3	500/330/10kV Navahi Substation	54
2.4.4	Expansion works in existing substations	55
3	REGULATORY FRAMEWORK	56
3.1	Constitution	56
3.2	National Environmental Legislation	57
3.3	National Energy Regulations	65
3.4	National ESIA Legislation	66
3.5	Regulatory Agencies	69
3.6	HSE Norms and Standards	71
3.7	International Conventions, Protocols and Agreements	71
3.8	International Environmental and Social Performance Standards and Guidelines	73
3.8.1	Equator Principles	73
3.8.2	WB ESF Environmental and Social Standards	75
3.8.3	IFC Performance Standards and Guidelines	76
3.8.4	Gap analysis: World Bank's ESS and Azerbaijan's Legislation	82
3.9	Regional Processes	95
3.9.1	European Union	95

3.9.2	EU4Environment	95
3.10	Stakeholder Engagement Standards	95
3.11	Red Book of the Republic of Azerbaijan	106
3.12	IUCN Red Data Book	106
3.13	Environmental Policy of AzerEnerji	107
3.14	Project Standards and Assessment Criteria	108
3.14.1	Water quality	108
3.14.2	Air quality	110
3.14.3	Noise and vibration	111
3.14.4	Soils and land use	114
3.14.5	Ionizing radiation	116
3.14.6	Waste management	117
4	ESIA METHODOLOGY	119
4.1	Introduction	119
4.2	Scoping	119
4.3	Limitations to the ESIA	120
4.4	Project Description	120
4.5	Discussion of Alternatives	121
4.6	Baseline Studies	121
4.6.1	Identification of Project Impact Area	122
4.6.2	Geographic Information Systems	122
4.6.3	Study methodology	122
4.7	Stakeholder Consultations	129
4.8	Impact Assessment	130
4.8.1	Identification of Potential Impacts	131
4.8.2	Assessment of Potential Impacts	132
4.9	Impact Management and Monitoring	136
4.10	Environmental and Social Management Plans	137
5	PROJECT ALTERNATIVES	138
5.1	“Zero Project” Scenario	138
5.2	Location Alternatives	139
5.3	Reconstruction vs New Construction Alternatives	138
6	ENVIRONMENTAL BASELINE	139
6.1	Introduction	139
6.2	Briefing of Study Area	139
6.2.1	OHL Corridors	139
6.2.2	Substations and Powerplants	142
6.3	Physiographic regioning	144
6.4	Geology	145
6.4.1	Geology of Ajinohur-Langabiz low mountain zone	146
6.4.2	Geology of Shirvan lowland	146
6.4.3	Geology of Eastern Gobustan	147
6.4.4	Mud Volcanoes	151
6.4.5	Geomorphology	152
6.4.6	Seismicity and earthquake hazards	155
6.4.7	Exogenous hazards	157
6.5	Soils and land use	158

6.5.1	Soils	158
6.5.2	Soil Quality	162
6.5.3	Land Use	165
6.6	Hydrology and surface water resources	173
6.6.1	Rivers	174
6.6.2	Irrigation canals	178
6.6.3	Water quality	180
6.6.4	Water use	183
6.7	Meteorology and climate	184
6.7.1	Climate of Study Area	184
6.7.2	Climate Change	187
6.8	Ambient Air Quality, Noise & Vibration	190
6.8.1	Existing air emission sources	190
6.8.2	Air emission sources of AzerEnerji	191
6.8.3	Onsite air quality monitoring results	192
6.8.4	Noise and vibration	197
6.9	Waste Management	199
6.9.1	National Baseline	199
6.9.2	Study Area Baseline	199
6.10	Biodiversity	200
6.10.1	Introduction	201
6.10.2	Biodiversity of Shirvan lowland and foothills of Ajinohur-Langabiz zone	202
6.10.3	Biodiversity of Eastern Gobustan	204
6.10.4	Protected nature areas / Key Biodiversity Areas	207
6.10.5	Species spread in the Project area	213
6.11	Landscape Visual Perception	226
6.11.1	“Azerbaijan TPP – Navahi SS”, “Absheron-Garadagh WPP – Gobu SS” OHLs	226
6.12	Ecosystem Services	229
6.12.1	Shirvan lowland	229
6.12.2	Ajinohur-Langabiz low mountain zone	233
6.12.3	Eastern Gobustan	236
7	SOCIOECONOMIC BASELINE	240
7.1	Introduction	240
7.2	Study Programme and Methodology	240
7.2.1	Study Programme	240
7.2.2	Study Methodology	240
7.3	National Baseline	248
7.3.1	Demography	248
7.3.2	Economy	248
7.3.3	Road Infrastructure	250
7.3.4	Energy	251
7.3.5	Water Supply and Sanitation	252
7.3.6	Education	253
7.3.7	Healthcare	254
7.4	District Level Baseline	254
7.4.1	Hajigabul	256
7.4.2	Shamakhi	258

7.4.3	Aghsu	261
7.4.4	Ismayilli	264
7.4.5	Goychay	267
7.4.6	Aghdash	270
7.4.7	Yevlakh	272
7.4.8	Mingachevir	274
7.4.9	Absheron	278
7.4.10	Gobustan	280
7.5	Local Baseline	284
7.5.1	Introduction	284
7.6	Navahi to Azerbaijan TPP	285
7.6.1	Hajigabul district	285
7.6.2	Shamakhi District	293
7.6.3	Aghsu District	297
7.6.4	Ismayilli District	308
7.6.5	Goychay District	310
7.6.6	Aghdash District	318
7.6.7	Yevlakh District	324
7.6.8	Mingachevir town	335
7.7	Navahi to Alat substation	337
7.7.1	Hajigabul	337
7.7.2	Alat	337
7.8	Navahi to Absheron wind plant	339
7.8.1	Hajigabul	339
7.8.2	Gobu (Qobu)	339
7.8.3	Absheron district	339
7.9	Absheron wind plant to Gobu	341
7.9.1	Absheron	341
7.9.2	Gobu	341
7.10	Traffic	341
7.10.1	Introduction	341
7.10.2	Road Infrastructure of the Project AoI	341
7.10.3	Traffic intensity assessment methods	343
7.10.4	Discussion of study results	346
7.11	Historical and Cultural Heritage	355
7.11.1	Methodology	355
7.11.2	Historical and archaeological heritage of the Project AoI	355
7.11.3	Sensitive objects identified during field studies	361
8	STAKEHOLDER ENGAGEMENT	368
8.1	Stakeholder Engagement During ESIA Process	368
8.1.1	Scoping	368
8.1.2	To Inform Baseline	370
8.1.3	Disclosure and Consultation on ESIA	370
8.2	Stakeholder Engagement During Project Implementation	371
8.3	Grievance Management	372
9	IMPACT ASSESSMENT	374
9.1	Introduction	374

9.1.1	Geographic coverage	374
9.1.2	Impact Sources, Receptors and Magnitudes	374
9.1.3	Mitigation Measures	379
9.1.4	Cumulative Impacts	380
9.1.5	Residual Impacts	380
9.2	Air Quality	380
9.2.1	Scope of assessment	380
9.2.2	Sources and sensitive receptors	381
9.2.3	Project standards and evaluation criteria	381
9.2.4	Assumptions and limitations	384
9.2.5	Identified impacts	385
9.2.6	Proposed impact mitigation measures	392
9.2.7	Residual Impacts	392
9.3	Noise, Vibration, Light Pollution	399
9.3.1	Scope of assessment	399
9.3.2	Sources and Sensitive receptors	399
9.3.3	Project standards and evaluation criteria	399
9.3.4	Assumptions and Limitations	402
9.3.5	Identified impacts	402
9.3.6	Proposed impact mitigation measures	409
9.3.7	Residual impacts	409
9.4	Soil Quality	414
9.4.1	Scope of Assessment	414
9.4.2	Sources and Sensitive Receptors	414
9.4.3	Project standards and evaluation criteria	415
9.4.4	Assumptions and limitations	415
9.4.5	Identified impacts	416
9.4.6	Proposed impact mitigation measures	420
9.4.7	Residual impacts	420
9.5	Water Quality	426
9.5.1	Scope of Assessment	426
9.5.2	Sources and Sensitive Receptors	426
9.5.3	Assumptions and Limitations	428
9.5.4	Identified water quality impacts	428
9.5.5	Proposed mitigation measures	431
9.5.6	Residual impacts	431
9.6	Biodiversity	434
9.6.1	Scope of assessment	434
9.6.2	Sources and Sensitive Receptors	435
9.6.3	Project standards	435
9.6.4	Assumptions and limitations	435
9.6.5	Identified impacts	436
9.6.6	Proposed impact mitigation measures	441
9.6.7	Residual impacts	441
9.7	Wastes	446
9.7.1	Scope of assessment	446
9.7.2	Sources and Sensitive Receptors	446

9.7.3	Project standards	447
9.7.4	Assumptions and limitations	447
9.7.5	Identified impacts	448
9.7.6	Proposed impact mitigation measures	454
9.7.7	Residual impacts	454
9.8	Ecosystem Services	463
9.8.1	Scope of assessment	463
9.8.2	Sources and Sensitive Receptors	463
9.8.3	Project Standards	463
9.8.4	Assumptions and limitations	463
9.8.5	Identified Impacts	464
9.8.6	Proposed impact mitigation measures	468
9.8.7	Residual impacts	468
9.9	Landscape Visual Perception	473
9.9.1	Scope of assessment	473
9.9.2	Sources and Sensitive Receptors	473
9.9.3	Project standards	473
9.9.4	Assumptions and Limitations	474
9.9.5	Identified impacts	474
9.9.6	Proposed impact mitigation measures	476
9.9.7	Residual impacts	476
9.10	Socio-Demographic Situation	479
9.10.1	Scope of assessment	479
9.10.2	Sources and Sensitive Receptors	479
9.10.3	Project standards	480
9.10.4	Assumptions and Limitations	480
9.10.5	Identified impacts	481
9.10.6	Proposed impact mitigation measures	486
9.10.7	Residual impacts	486
9.11	Economic Welfare, Employment Opportunities	492
9.11.1	Scope of assessment	492
9.11.2	Sources and sensitive receptors	492
9.11.3	Project standards	492
9.11.4	Assumptions and Limitations	493
9.11.5	Identified impacts	494
9.11.6	Proposed impact mitigation measures	495
9.11.7	Residual impacts	495
9.12	Infrastructure and Transport	498
9.12.1	Scope of assessment	498
9.12.2	Sources and sensitive receptors	498
9.12.3	Project standards	498
9.12.4	Assumptions and limitations	499
9.12.5	Identified impacts	500
9.12.6	Proposed impact management measures	502
9.12.7	Residual impacts	502
9.13	Health and Safety	506
9.13.1	Scope of assessment	506

9.13.2	Impact Sources and Sensitive Receptors	506
9.13.3	Project standards	506
9.13.4	Assumptions and limitations	506
9.13.5	Identified impacts	507
9.13.6	Proposed impact management measures	511
9.13.7	Residual impacts	511
9.14	Historical-Cultural Heritage, Sensitive Social Facilities	518
9.14.1	Scope of assessment	518
9.14.2	Impact Sources and Sensitive Receptors	518
9.14.3	Project standards	519
9.14.4	Assumptions and limitations	519
9.14.5	Identified impacts	520
9.14.6	Proposed impact management measures	522
10	ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	527
10.1	Introduction	527
10.2	Tasks and Objectives	527
10.3	Implementation Period	528
10.4	Responsibility of Parties	528
10.5	Impact Management Hierarchy	528
10.6	ESMP Revision and Update	530
10.7	Training and Registration	530
10.8	Control	530
10.9	Non-compliance	531
10.10	Environmental and Social Management Plans	532
10.11	Performance Reporting	705
10.12	ESMP COSTS	706
11	MONITORING PLAN AND AUDIT	707
11.1	Objectives and contents	707
11.2	Reporting	712
11.3	Data Storage	714
11.4	Data Confidentiality	714
11.5	Interim notes on exceeding environmental quality limits	715
11.6	Onsite audit and grievance	716
11.7	Monitoring form	719
12	CONCLUSION AND RECOMMENDATIONS	722
13	PUBLIC CONSULTATION	724
14	BIBLIOGRAPHY	777
15	ANNEXES	782

Annex 1. Fieldwork and Laboratory Analysis Results: Surface Water Resources	784
Annex 2. Fieldwork and Laboratory Analysis Results: Soils	790
Annex 3. Fieldwork and Laboratory Analysis Results: Air quality, Noise & Vibration	794
Annex 4. Traffic Intensity Monitoring	805
Annex 5. Stakeholder Engagement: Focus Group Consultations	840
Annex 6. Stakeholder Engagement: Document Templates	876
Annex 7. Biodiversity Management Plan	889
Annex 8. Labour Management Procedures	942

Annex 9. Photos from Fieldwork 943
Annex 10. HSE Norms and Standards 955
Annex 11. Responsibility of Parties 978

List of Tables

Table 1.1. Programme of ESIA Studies 19
Table 1.2. ESIA team members 23
Table 2.1. Number of parcels and households affected by the AZURE Project 44
Table 2.2. Land requirements of overhead transmission lines 45
Table 3.1. Key national environmental and social regulations 58
Table 3.2. Summary of the active EIA requirements in Azerbaijan 67
Table 3.3. Overview of Relevant Institutions at Government Level 69
Table 3.4. Overview of Relevant State Energy Entities 71
Table 3.5. International and regional conventions 71
Table 3.6. A brief summary of how each Performance IFC standard applies to the Project 79
Table 3.7. IFC and WB Group Guidance Publications Relevant to the Project 80
Table 3.8. EHS Guidance Publications relevant to the Project 81
Table 3.9. High-level summary of key gaps between the WB's and Azerbaijan's requirements 82
Table 3.10. Water quality standards 108
Table 3.11. Air quality standards 111
Table 3.12. Maximum allowable noise levels in residential and public buildings 111
Table 3.13. IFC Noise Guidelines 112
Table 3.14. Allowable noise levels at workplaces 113
Table 3.15. Comparison of ACGIH limit values (TLVs) for hand vibration exposure in X, Y or Z direction and daily exposure in EU Directive 2002/44/EC 114
Table 3.16. EU Vibration Directive (2002/44/EC): Impact limits 114
Table 3.17. Allowable concentration levels of potential soil contaminants (ppm) 115
Table 3.18. Maximum effective radiation doses allowed for workplaces 117
Table 4.1. Analysed soil quality parameters 124
Table 4.2. Analysed water quality parameters 125
Table 4.3. Nature and types of impact related terms 130
Table 4.4. Potential Impact Characteristics: Terminology 131
Table 4.5. Likelihood of Event-Related Impacts 132
Table 4.6. Potential Impact Significance 133
Table 4.7. Significance of potential environmental impacts 134
Table 4.8. Significance of potential social impacts 135
Table 4.9. Significance of potential health impacts 136
Table 6.1. Main characteristics of soil sampling locations 163
Table 6.2. Land use categories of the Project AoI lands 166
Table 6.3. Physical parameters of surface water sources of the Project AoI 181
Table 6.4. GHG emissions and absorptions by sectors, Million tons CO2-equiv. 188
Table 6.5. Summary of ambient air quality monitoring results 195
Table 6.6. Summary of noise and vibration measurement results 198
Table 6.7. Division of plants by life form 213
Table 6.8. Rare plant species of regional priority distributed in the project area as of 2023 214
Table 6.9. Fishes of middle and lower reaches of Kur 216
Table 6.10. Amphibians and reptiles distributed along OHL corridors 218

Table 6.11. Birds distributed along the OHL corridors 220
Table 6.12. Mammals distributed along the Power Line 224
Table 6.13. Major ecosystem services identified in the Shirvan lowland 229
Table 6.14. Major ecosystem services identified in the Ajinohur-Langabiz low mountains 233
Table 6.15. Major ecosystem services identified in the Eastern Gobustan 236
Table 6.16. Sensitive bird areas amd migration corridors along the Project's OHLs 240
Table 7.1. Stakeholders interviewed to obtain data on the Project area's socioeconomic baseline 240
Table 7.2. Demographic indicators of Azerbaijan. 241
Table 7.3. Main socioeconomic indicators of Azerbaijan. 247
Table 7.4. Electrical power balance of Azerbaijan (million KWt/h). 248
Table 7.5. Natural gas balance of Azerbaijan (million m3). 250
Table 7.6 Communities arranged by project infrastructure componenta 283
Table 7.7. Vulnerability, Social receptors and health care data: Hajigabul district 284
Table 7.8. Vulnerability, Social receptors and health care data: Shamakhi district 292
Table 7.9. Vulnerability, Social receptors and health care data: Aghsu district 297
Table 7.10. Vulnerability, Social receptors and health care data: Ismayilli district 307
Table 7.11. Vulnerability, Social receptors and health care data: Goychay district 310
Table 7.12. Vulnerability, Social receptors and healthcare data: Aghdash district 317
Table 7.13. Vulnerability, Social receptors and healthcare data: Yevlakh district 324
Table 7.14. Vulnerability, Social receptors and healthcare data: Mingachevir 334
Table 7.15. General information on the local communities of Alat Administrative Territorial Unit 336
Table 7.16. List of registered historical and cultural monuments located in the Project AoI 357
Table 7.17. Cultural and spiritual objects identified in the direct impact area of the Project 360
Table 9.1. Receptor importance and sensitivity 374
Table 9.2. Shortest distances between AoI settlements and the Project facilities 376
Table 9.3. Impact / sensitivity degree of receptors 378
Table 9.4. Ambient air quality standards 381
Table 9.5. Dust emission factors 382
Table 9.6. Calculation coefficients of CO2 formed as a result of fuel combustion 383
Table 9.7. Estimated emission volumes of pollutant and greenhouse gases 385
Table 9.8. Dust related impacts of the project 388
Table 9.9. Impacts related to emission of pollutant and greenhouse gases 389
Table 9.10. Measures to manage air related impacts 392
Table 9.11. Noise level standards 400
Table 9.12. Noise levels generated by engine- equipped machinery 400
Table 9.13. Project standards on vibration levels 403
Table 9.14. Typical Noise levels expected from the Project activities 403
Table 9.15. Noise levels generated by engine-equipped machinery 404
Table 9.16. Typical Combined Noise Levels 404
Table 9.17. Criteria for assessing damage to a building 405
Table 9.18. Noise and vibration related impacts of the Project 407
Table 9.19. Measures to manage noise and vibration related impacts 409
Table 9.20. Soil quality related impacts of the Project 418
Table 9.21. Measures to manage soil quality related impacts 420
Table 9.22. Surface water quality related impacts of the Project 429
Table 9.23. Measures to manage water quality related impacts 431
Table 9.24. Biodiversity related impacts of the Project 438

Table 9.25. Measures to manage biodiversity related impacts 441
Table 9.26. Waste related impacts of the Project 451
Table 9.27. Measures to manage waste related impacts 454
Table 9.28. Ecosystem services related impacts 465
Table 9.29. Measures to manage ecosystem services related impacts 468
Table 9.30. Landcape visual perception related impacts 474
Table 9.31. Measures to manage landscape related impacts 476
Table 9.32. Sociodemographic impacts 483
Table 9.33. Measures to manage sociodemographic impacts 486
Table 9.34. Economic welfare and employment related impacts of the Project 493
Table 9.35. Measures to manage economic welfare and employment related impacts 495
Table 9.36. Infrastructure and transport related impacts of the Project 499
Table 9.37. Measures to manage infrastructure and transport related impacts 502
Table 9.38. Health and safety related impacts of the Project 508
Table 9.39. Measures to manage health and safety related impacts 511
Table 9.40. Infrastructure impacts of the Project 520
Table 9.41. Measures to manage heritage related impacts 522
Table 10.1. Environmental and Social Management Plan: construction phase 532
Table 10.2. Environmental and Social Management Plan: Operation phase 655
Table 11.1. Monitoring Plan 709
Table 11.2. Sample form for Environmental Monitoring List 719
Table 10.1. Details of RoW defined by Decree-103 and Restricted Activities 977

List of Figures

Figure 1.1. Geographic scope of ESIA studies 17
Figure 1.2: Map of the ESIA covered Project areas 26
Figure 2.1: Overview of the AZURE Project scope and associated facilities 33
Figure 2.2: Map of "Azerbaijan TPP - Navahi SS" OHL: Mingachevir-Goychay section 35
Figure 2.3: Map of "Azerbaijan TPP - Navahi SS" OHL: Goychay-Navahi section 35
Figure 2.4: Map of "Alat FEZ SS - Navahi SS" OHL, "Absheron-Garadagh WPP - Navahi SS" OHL and "Absheron- Garadagh WPP - Gobu ES" OHL 36
Figure 2.5: Structure of double-circuit 330 kV anchor tower, protection zone and approximate configuration of the corridor 37
Figure 2.6: Structure of intermediate double-circuit 330 kV support, protection zone and approximate configuration of the corridor 37
Figure 2.7: A possible general view of the 330 kV double-circuit intermediate tower 38
Figure 2.8: An example of installed and assembled towers 39
Figure 2.9: Location of Navahi SS 41
Figure 2.10: Photos from Navahi SS 41
Figure 2.11: Location of Absheron SS 42
Figure 2.12: Location of Gobu PP and associated SS 43
Figure 2.13 Construction camps situated on the territories of the facilities owned by AzerEnerji 48
Figure 3.1: Overview of Existing Renewable Energy Permitting Procedures (IRENA, 2019) 66
Figure 4.1: Framework methodology for review of project alternatives 121

Figure 6.1: Typical Section of the 200-meter study corridor showing the 60-meter Safety Zone 140
Figure 6.2: Map of the EBS coverage area: OHLs 142
Figure 6.3: EBS coverage area - “Azerbaijan” TPP 143
Figure 6.4: EBS coverage area – “Gobustan” WPP 143
Figure 6.5: EBS coverage area – “Navahi” SS 144
Figure 6.6: Geological structure of the Project area 149
Figure 6.7: Mud volcanoes located close to the Project AoI 151
Figure 6.8: Geomorphological map of the Project AoI 155
Figure 6.9: Seismic zones of Azerbaijan 156
Figure 6.10: Index map of the recorded earthquake distribution in Azerbaijan (1973-2023). 156
Figure 6.11: Soil cover of the Project AoI 161
Figure 6.12: Map of soil sampling locations 164
Figure 6.13: Land use map of the Project AoI: Mingachevir-Arab section 168
Figure 6.14: Land use map of the Project AoI: Mirzahuseynli-Girdimanchay section 169
Figure 6.15: Land use map of the Project AoI: Muradli Takla – Nvahi section 170
Figure 6.16: Land use map of the Project AoI: Navahi-Alat section 171
Figure 6.17: Land use map of the Project AoI: Navahi-Gobustan section 172
Figure 6.18: Hydroligical map of the Project AoI 179
Figure 6.19: Map of water sampling locations 182
Figure 6.20: Location map of air quality monitoring stations 194
Figure 6.21. Interference of Project AoI with bird migration routes and Key Ornithological Areas 210
Figure 6.22: Map of Key Ornithological Areas 212
Figure 7.1: Geographic scope of socioeconomic baseline studies (sheet 1) 244
Figure 7.2: Geographic scope of socioeconomic baseline studies (sheet 2) 245
Figure 7.3: Geographic scope of socioeconomic baseline studies (sheet 3) 246
Figure 7.4. Situation map of the districts against the Project AoI 254
Figure 7.5: Project affected settlements and sensitive receptors: Hajigabul district 286
Figure 7.6: Project affected settlements and sensitive receptors: Shamakhi district 293
Figure 7.7: Project affected settlements and sensitive receptors: Aghsu district 299
Figure 7.8: Project affected settlements and sensitive receptors: Ismayilli district 308
Figure 7.9: Project affected settlements and sensitive receptors: Goychay district 312
Figure 7.10: Project affected settlements and sensitive receptors: Aghdash district 319
Figure 7.11: Project affected settlements and sensitive receptors: Yevlakh district and Mingachevir 326
Figure 7.12: Photos from traffic intensity monitoring activities 343
Figure 7.13: Location map of traffic intensity monitoring stations. 344
Figure 7.14: Daily traffic intensity indicators: Sahil-Mushfigabad road (TP1) 346
Figure 7.15: Daily total traffic dynamics: Sahil-Mushfigabad road (TP1) 346
Figure 7.16: Daily traffic intensity indicators: Aghsu-Kurdamir road (TP2) 347
Figure 7.17: Daily total traffic dynamics: Aghsu-Kurdamir road (TP2) 347
Figure 7.18: Daily traffic intensity indicators: Garamaryam-Mususlu road (TP3) 348
Figure 7.19: Daily total traffic dynamics: Garamaryam-Mususlu road (TP3) 348
Figure 7.20: Daily traffic intensity indicators: Baku-Shamakhi-Yevlakh - Garamaryam-Goychay (TP4) 349
Figure 7.21: Daily total traffic dynamics: Baku-Shamakhi-Yevlakh hwy - Garamaryam-Goychay (TP4) 349
Figure 7.22: Daily traffic intensity indicators: Aghdash-Zaraghan road (TP5) 350
Figure 7.23: Daily total traffic dynamics: Aghdash-Zaraghan road (TP5) 350
Figure 7.24: Daily traffic intensity indicators: Yevlakh-Zagatala-Georgia highway (TP6) 351
Figure 7.25: Daily total traffic dynamics: Yevlakh-Zagatala-Georgia highway (TP6) 351

Figure 7.26: Daily traffic intensity indicators: Khaldan-Mingachevir highway (TP7) 352
Figure 7.27: Daily total traffic dynamics: Khaldan-Mingachevir highway (TP7) 352
Figure 7.28: Daily traffic intensity indicators: Mingachevir highway (TP8) 353
Figure 7.29: Daily total traffic dynamics: Mingachevir highway (TP8) 353
Figure 7.30. Location map of historical monuments within Project AoI 359
Figure 7.31: Location map of cultural objects in the direct impact area: Yevlakh and Aghdash 363
Figure 7.32: Location map of Cultural objects in the direct impact area: Goychay 364
Figure 7.33: Location map of Cultural objects in the direct impact area: Aghsu, Shamakhi 365
Figure 7.34: Location map of Cultural objects in the direct impact area: Hajigabul 366
Figure 9.1: "Navahi SS – Absheron- Garadagh WPP" OHL corridor: location of the closest volcanic structures 417
Figure 11.1: Grievance Evaluation Criteria 717

LIST OF ABBREVIATIONS

ACGIH	American State Conference on Industrial Hygiene
ANAS	Azerbaijan National Academy of Sciences
AoI	Area of Impact
AP	air quality monitoring point
AR	Azerbaijan Republic
ARCCOM	State Committee for Urban Planning and Architecture
ATU	Administrative Territorial Unit
AWAC	Acoustic Wave and Currents
AZN	Azerbaijan Manat
AZS	Azerbaijan Standard
AzRDB	Azerbaijan Red Data Book
BID	Background Information Document
BMP	Biodiversity Management Plan
BOD	Biochemical Oxygen Demand
BSc	Bachelor of Science
CBO	Community Based Organization
CIS	Commonwealth of Independent States
CLC	Civil Liability Convention
CLO	Community Liaison Officer
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CJSC	Closed Joint Stock Company
COD	Chemical Oxygen Demand
COO	Management Appointee
CR	Critically Endangered
CSR	Corporate Social Responsibility
dB	Decibel
dBA	A-weighted decibels
DD	Data Deficient
DO	dissolved oxygen
EA	Executive Authority
EAAA	Ecological Appropriate Area of Analysis
EBRD	European Bank for Reconstruction and Development
EBS	Environmental Baseline Studies
EC	electrical conductivity
EHS	Environmental, Health, and Safety Guidelines
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EN	Endangered
ENP	European Neighbourhood Policy
EP	Equator Principles
EPFI	Equator Principles Financial Institutions

ER	Environmental Report
ESA	Ecosystem Services Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management and Monitoring Plans
EU	European Union
EX	Extinct
EW	Extinct in wild
FAO	Food & Agriculture Organization
FPIC	Free, Prior, and informed Consent
g	gram
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GoA	Government of Azerbaijan
GOST	State Standard
ESCP	Environmental and Social Commitment Plan
IOA	Important Ornithological Area
ICP	Informed Consultation and Participation
IFC	International Finance Corporation
KBA	Key Biodiversity Area
ISO	International Organization for Standardization
ISR	Interstate Construction Regulations
IUCN	International Union for Conservation of Nature
HSE	Health, Safety & Environment
Kg	kilogram
Kcal	Kilocalorie
kW	Kilowatt
l	litre
IAEA	International Atomic Energy Agency
LC	Least Concern
LMP	Labour Management Plan
LVC	Light Volatile Compounds
LVIA	Landscape Visual Impact Assessment
MAC	maximum allowable concentration
MDDT	Ministry of Digital Development and Transport of Azerbaijan
ME	Ministry of Economy
MEA	Millennium Ecosystem Assessment
MES	Ministry of Emergency Situations
MENR	Ministry of Environment and Natural Resources
mg	milligram
MH	Ministry of Health
ml	Millilitre
MLSPP	Ministry of Labour and Social Protection of Population

MSc	Master of Science
MSE	Ministry of Science and Education
mSv	MilliSievert
MWt	MegaWatt
NE	Not Evaluated
NGO	Non-Governmental Organization
NP	National Park
NT	Near Threatened
OECD	Organisation for Economic Co-operation and Development
OHS	Occupational Health and Safety
OHSAS	Occupational Health and Safety Assessment
OJSC	Open Joint Stock Company
OSCE	Organization for Security and Co-operation in Europe
PAH	Polycyclic aromatic hydrocarbon
PAP	Project Affected People (Parties)
PCA	Partnership and Cooperation Agreement
PCB	polychlorinated biphenyl
pH	Potential for hydrogen ion concentration
PhD	Philosophy doctor
PIU	Project Implementation Unit
Ppm	parts per million
PPE	Personal Protection Equipment
PR	Performance Requirement
Prof.	Professor
PS	Performance Standard
QHSSE	Quality, Health, Safety, Security and Environment
RPF	Resettlement Policy Framework
SanPiN	Sanitary Rules and Norms
SBS	Socioeconomic Baseline Studies
SEE	State Environmental Expertise
SEEA	State Environmental Expertise Agency
SEP	Stakeholder Engagement Program
SOCAR	State Oil Company of Azerbaijan Republic
SS	substation
SQ	soil sampling point
SSPI	State Service on Property Issues
TP	Traffic intensity monitoring point
TPH	Total petroleum hydrocarbons
TSS	Total suspended solids
UN	United Nations
UNDP	UN Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	UN Environmental Programme

UNESCO	UN Educational, Scientific, and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
USEPA	US Environmental Protection Agency
UTC	Coordinated Universal Time
VU	Vulnerable
WBG	World Bank Group
WHO	World Health Organization
WQ	water monitoring and sampling point

1. INTRODUCTION

1.1. Purpose of the ESIA Report

“Azerbaijan Scaling-Up Renewable Energy Project” (Hereinafter - The AZURE Project) is a significant undertaking in Azerbaijan aimed at expanding the country's renewable energy capacity and infrastructure. It involves the development of a system for transmitting electricity generated from renewable sources, such as solar and wind power plants. This project is crucial for Azerbaijan's commitment to transitioning towards a greener and more sustainable energy future.

Design, construction and operation of any major energy facility tends to be a long and complex project. One of the most important issues to be considered during organization of such projects is the identification and mitigation of all potential environmental and social adverse impacts expected from the performance of all planned activities.

An Environmental and Social Impact Assessment (ESIA) has an ultimate goal to identify and assess all impacts and risks emerging from a development project and propose impact-specific mitigation and management measures. Well prepared ESIAs, i) provide decision-makers with comprehensive information about a project's potential environmental and social impacts, enabling them to make informed choices, ii) promote sustainable development by ensuring projects are designed and implemented in an environmentally and socially responsible manner; iii) safeguard the environment and the well-being of affected communities by identifying and mitigating potential harms; iv) facilitate public participation, offering stakeholders opportunities to voice their concerns and contribute to the decision-making process; v) help enhance project design and implementation by incorporating mitigation measures and environmental and social considerations from the outset. aESIA can be looked at as an early warning system of the impacts that can emerge throughout an entire project lifetime. This will lead to the best chance of identifying all impacts and impact management measures before seeking approval from the respective authorities.

1.2. ESIA Scope and Methodology

This ESIA was developed to address the scope of the AZURE project financed by the World Bank (WB), presented in Section 2. The geographical scope of the ESIA studies covers the following components:

- West-east trending corridors of "Azerbaijan TPP - Navahi SS" (235 km);
- North-South trending corridors of "Alat FEZ SS - Navahi SS" (22 km), "Absheron-Garadagh WPP - Navahi SS" (65 km) and "Absheron-Garadagh WPP - Gobu ES" (19 km) single and double circuit OHLs;
- Construction and operation sites of Navahi SS, "Azerbaijan" TPP, Absheron SS, and Gobu PP

Map of the geographical scope of the studies is provided in Figure 1.1 below.

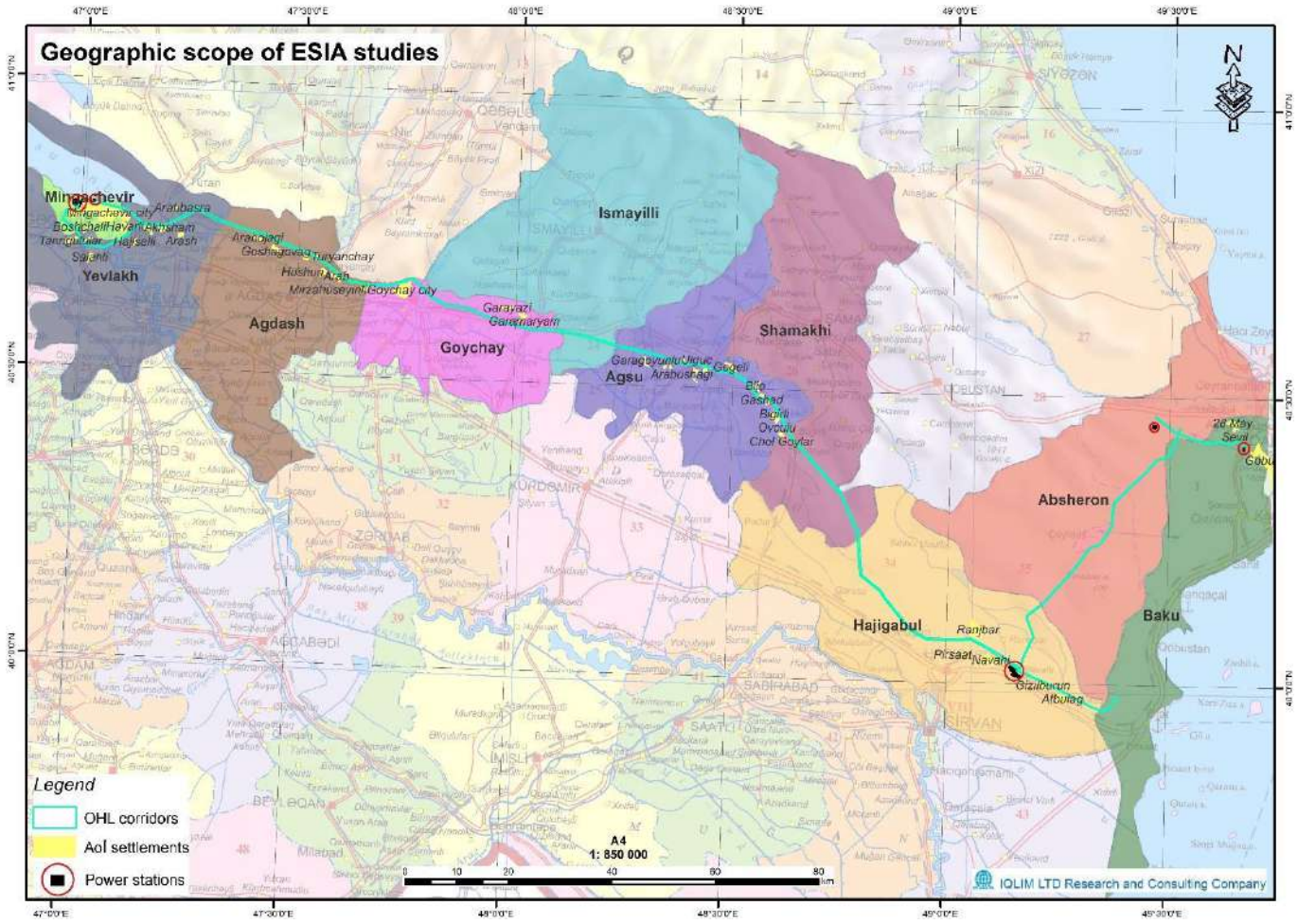


Figure 1.1. Geographic scope of ESIA studies

The objectives of the current ESIA are to achieve the following tasks:

- Comprehensive study of the pre-Project environmental and social baseline of the project sites and the project areas of impact (hereinafter - AoI);
- Study of all feasible alternatives of the Project and its' individual components (including "Zero Project" alternative)
- Regardless of the probability, magnitude and receptor sensitivity of every single impact, identification and complex assessment of all direct/indirect, as well as negative/positive impacts expected from various sources throughout the construction and operation phases of the Project
- Development of appropriate, effective and feasible impact management measures according to the impact management hierarchy (prevention / mitigation / rehabilitation / compensation)
- Preparation of environmental and social management / monitoring plans of the Project, based on the identified impact management activities
- Listing of all Project stakeholders, including Project Affected People (hereinafter, PAP) and the interested parties.

- Preparation of the "Stakeholder Engagement Programme" for the Project
- Throughout the ESIA process, organization of constant consultations with all PAP, key and non-key project stakeholders and general public about the contents, potential benefits and impacts of the Project, recording of received stakeholder feedback, and, if necessary, making changes and additions to the ESIA and Project documentation.

AzerEnerji will make this ESIA available for the respective government agencies and financial institutions. The ESIA will be also available for a general public's review and comments. Ensuring stakeholder engagement in the ESIA process as well as maintaining the two-way communications between AzerEnerji and stakeholders will be organized according to the requirements of both international financial institutions and GoA. Stakeholder engagement outcomes will form one of the cornerstone components of the final ESIA package submitted for the approval by relevant government authorities.

1.3. ESIA Programme

Study programme of the present ESIA was developed based on the study components described in the section above, and covered the period of 11 weeks from July 15 to October 01, 2024 with main studies implemented until August 20, and additional socioeconomic surveys (community group consultations) organized in September 28 – October 01. Main study components and their implementation schedule are shown in Table 1.1 below.

Table 1.1. Programme of ESIA Studies

Study component	Study type	Study methods	Weeks										
			1	2	3	4	5	6	7	8	9	10	11
Regulatory framework	Desktop	Using summary provided in the Scoping report, Desktop study and summarization of applicable international treaties, domestic laws and regulations											
ESIA Methodology	Desktop	Adaptation of ESIA methodology to the Project's needs and its' summarization											
Project description	Desktop	Using the Scoping report and more detailed data provided by the Client, development of detailed project description											
Project alternatives	Desktop	Using summary provided in the Scoping report, analysis and summarization of the Project alternatives											
Environmental baseline studies													
Climate Climate change	Desktop	Based on literature data, description of the below main climate characteristics: *Solar radiation* *Air temperature* *Humidity* *Precipitation* *Snowfall* *Wind regime* *Climate change* *Evaporation*											
Geology	Desktop	Based on literature data, study and summarization of the below main geological and geomorphological characteristics: *Geology* *Hydrogeology* *Seismicity* *Mud volcanism* *Geomorphology* *Disaster hazards*											
Hydrology	Desktop	Based on literature data, study and summarization of the main hydrographic and hydrological parameters of the below main AoI water bodies: *Alijanchay, Turyanchay, Goychay, Girdimanchay, Aghsuchay and Pirsaat rivers*											

Study component	Study type	Study methods	Weeks										
			1	2	3	4	5	6	7	8	9	10	11
		Mil-Garabagh Collector, Upper Shirvan canal											
Water quality	Sample collection and analysis	Collection and analysis of water samples at 8 locations on rivers and 2 locations on the irrigation facilities *Analysis parameters (physiochemical):* *pH, temperature, dissolved oxygen, salinity, transparency, turbidity, BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), nitrates, nitrites, ammonium, phosphates, sulfides, sodium, calcium, magnesium, potassium, chlorine, sulfate, bicarbonate, polycyclic aromatic hydrocarbons, total petroleum hydrocarbons, total coliforms*											
Air quality Noise Vibration	Desktop Onsite monitoring	Desktop study of main air emission sources in AoI, including emissions generated by AzerEnerji Conduct of air quality, noise and vibration monitoring at 14 locations around the residential areas along OHL corridors, and in the vicinities of powerplants and substations *Monitoring parameters:* *CO, O_2, H_2S, SO_2, NO_2, CO_2* *PM2.5, PM10, general dust.* *dBA (L_{eq}, L_{max} və L_{min}).* *Maximum velocity of dust particles*											
Soil types	Desktop	Based on literature data, study and summarization of the soil types developed in the Project AiO											
Land use	Desktop	Based on literature data and data provided by local authorities, study and summarization of landuse in the Project AiO											
Soil quality	Sample collection and analysis	Collection and analysis of soil samples at 8 locations across AoI, identified based on main soil and landuse types *Analysis parameters:* *pH, chloride, calcium, magnesium, arsenic, mercury, cadmium, chromium, copper, cobalt, lead, aluminium, iron, nickel, zinc, oiliness*											

Study component	Study type	Study methods	Weeks										
			1	2	3	4	5	6	7	8	9	10	11
Biodiversity	Desktop	Based on literature data and updated field studies, study and summarization of the below biodiversity features of the Project AoI: *Flora, Fauna, Protected Nature Areas, Key Biodiversity Areas, sensitive and critical habitats, Bird migration routes*											
Ecosystem services	Desktop Onsite	Based on literature data and data provided by local authorities, identification and characterization of ecosystem services in the Project AoI											
Landscape visual perception	Desktop Onsite	Study and summarization of the AoI's landscape diversity											
Wastes	Desktop	Based on data provided by local authorities and AzerEnerji, study of solid, liquid and industrial waste management projects in the Project AoI and in AzerEnerji facilities											
Socioeconomic Baseline Studies													
Socioeconomic baseline	Desktop	Based on data provided by local authorities, study and summarization of the socioeconomic baseline of the Project affected districts and communities (33 settlements)											
Traffic intensity	Onsite	Organization of 1-day traffic intensity monitoring on the following main roads crossed by the Project: *Mingachevir, Yevlakh-Zaqatala-Georgia, Baku-Shamakhi-Yevlakh highway highways* *Mingachevir-Khaldan, Aghdash-Zagatala, Aghsu-Kurdamir-Bahramtapa roads*											
Cultural and historical heritage	Desktop	Based on literature data, study and summarization of cultural and historical heritage of the Project AoI											
Impact assessment	Desktop	Based on detailed Project description, results of environmental and socioeconomic baseline studies, and the summary provided by the											

Study component	Study type	Study methods	Weeks										
			1	2	3	4	5	6	7	8	9	10	11
		Scoping Report, detailed assessment of the Project's potential environmental and socioeconomic impacts											
Environmental and Social Management Plans	Desktop	Based on the results of environmental and socioeconomic impact assessment, development of environmental and social management plans of the Project											
Stakeholder Engagement Programme	Desktop Stakeholder consultations	Development of detailed SEP for the Project											
Final report	Desktop	Development and submission of the draft ESIA Report to AzerEnerji											

1.4. ESIA Team

The following employees of the "IQLİM Ltd." MMC company participated in the ESIA studies, as listed in Table 1.2 below.

Table 1.2. ESIA team members

Name	Role in the project	Position / qualification
Mirzakhan Mansimov	Project Director Hydrology, Environmental Impact Assessment, Project Organization and Management	Director and Project manager, BSc, MSc, PhD.
Ilkin Kangarli	Environmentalist, environmental impact assessment	Project manager, BSc, MSc, PhD.
Gulara Mammadova	Environmental quality specialist, air pollution and waste management	BSc, MSc, PhD.
Gunel Sadikhova	Social and community outreach specialist	BSc, MSc,
Leyla Sadikhova	Preparation and laboratory analysis of samples, Quality control, standardization	Chemical engineer BSc, MSc. PhD.
Hikmet Agayev	Field investigations and environmental monitoring	Environmental engineer. BSc, MSc.
Seymur Gojayev	Hydrogeology and soil investigation	Engineer hydrogeologist. BSc, MSc.
Yusif Abiyev	Assessment of terrestrial flora diversity, survey, baseline and impact assessment	Botany expert. BSc, MSc, PhD.
Aytac Muradova	Assessment of river flora diversity, survey, baseline	Botany expert. BSc, MSc, PhD.
Sabina Bunyatova	Assessment of reptiles and amphibians, survey and reporting	Herpetology expert. BSc, MSc, PhD
Nijat Huseynov	Mammals and bats, field investigation and reporting	Theriologist. BSc, MSc, PhD,
Abidin Abbasov	Ornithology, field investigation and reporting	Ornithologist. BSc, MSc, PhD,
Rafael Alasov	Field investigations and environmental monitoring, transport assessment	Environmental Engineer. BSc
Shamil Najafov	Archaeology and historical-cultural heritage	Expert in archaeology and cultural heritage. BSc, MSc, PhD.
Matanat Musaeva	Meteorology and climate, hydrology	Expert on climate change. BSc, MSc, PhD.
Namiq Mustafayev	River ecosystems	Expert on ichthyology. BSc, MSc, Dr., Prof.
Nesir Qasimov	Data collection and mapping, GIS/	GIS specialist BSc

1.5. Overview of the Project

In recent years, there has been a growing global focus on transitioning towards renewable energy sources as a sustainable and environmentally friendly alternative to traditional fossil fuels. AzerEnerji recognizes the importance of this transition and has embarked on a strategic initiative to promote the integration of renewable energy into the existing energy infrastructure.

The Project initiative aims to address key challenges and opportunities related to the effective integration of renewable energy sources (solar, wind, hydro) into the energy grid. By leveraging innovative technologies, policy frameworks, and stakeholder collaboration, the project seeks to accelerate the adoption and integration of renewables, contributing to a more sustainable and resilient energy ecosystem.

The Project is a part of Azerbaijan's renewable energy portfolio, currently with 50 MW of wind and 30 MW of solar capacity, and is set to expand by 4 GW through a partnership with Masdar. The Project will finance (i) the construction of a 330 kV transmission connection to evacuate power from the 240 MWac Absheron Wind IPP, and (ii) the 500 kV upgrade of Navahi Substation and related infrastructure for the reliable N-1 evacuation of 1 GW of variable renewable energy connected to the Navahi substation, and the enhanced fluctuation management of 1.8 GW of VRE capacity in the system to ensure grid stability.

"Azerbaijan Scaling-Up Renewable Energy Project" (Hereinafter - The AZURE Project) was initiated by the Government of Azerbaijan (hereinafter - GoA) as a significant undertaking in Azerbaijan aimed at expanding the country's renewable energy capacity and infrastructure. It involves the development of a system for transmitting electricity generated from renewable sources.

Key aspects and goals of the AZURE project:

Scaling up renewable energy: The primary objective is to significantly increase the share of renewable energy in Azerbaijan's energy mix. This involves the construction of new solar and wind power plants across the country.

Strengthening transmission infrastructure: To accommodate the increased renewable energy generation, the project focuses on expanding and modernizing the existing electricity transmission network. This includes the addition of new substations and power lines.
Integrating renewable energy into the grid: The AZURE project aims to ensure the smooth and efficient integration of renewable energy sources into the national grid. This involves addressing technical challenges related to the intermittent nature of solar and wind power.

International collaboration: Azerbaijan is collaborating with international financial institutions, such as the World Bank, to secure funding for the project. There are also discussions with neighboring countries like Uzbekistan and Türkiye about potential cooperation in the renewable energy sector.

Socioeconomic and environmental benefits: The AZURE project is expected to bring numerous benefits to Azerbaijan, including increased energy security, reduced reliance on fossil fuels, lower greenhouse gas emissions, and the creation of new jobs in the renewable energy sector. Thus, the construction of the 240 MW Absheron wind power plant will reduce emissions of about 302,000 tons of CO2 eq/year **tCO2eq/year** and save millions of cubic meters of natural gas resources of the country.

The Azerbaijani government, recognizing the importance of scaling up renewable energy and the need for technical and financial assistance, approached the World Bank to explore potential collaboration on the AZURE project. The AZURE Project has been prepared and will be implemented by the "AzerEnerji" JSC. The Project forms part of the AzerEnerji's Strategic Development Plan.

The AZURE project financed by the World Bank comprises the following:

- Connection of Absheron Wind IPP – 330 kV Grid, including:
- 65 km OHL single circuit 330 kV from Absheron wind plant substation to Navahi substation
- 19 km OHL single circuit 330 kV from Absheron wind plant substation to Gobu PP substation and
- 22 km OHL double circuit 330 kV from Navahi substation to Alat substation and
- Expanding 330 kV bays at Gobu PP substation.

500 kV Strengthening, including:

- 235 km single circuit OHL 500 kV from Azerbaijan TPP substation to Navahi substation
- Supply and installation of equipment for 500 kV part of Navahi (2x 500 MVA) substation
- Expanding the 500 kV bays at Absheron and Azerbaijan TPP substations.

Legal and Institutional Framework

The ESIA study for the AZURE Project was carried out considering the requirements of national regulations and the Environmental and Social Standards (ESSs) of the World Bank ESF. The Chapter 2 outlines national institutional arrangements, the national institutional framework, policy and legislation requirements pertinent to the Project as well as WB ESSs relevant to the Project.

ESIA Study Components

The main ESİA components developed for AZURE Project are presented and are briefly described below.

Part A: Implementation frameworks. This component provides the information on Project background, including its' description and regulatory framework. It also discusses the Project's different feasible alternatives and provides a rationale for the selected option.

Part B: Baseline Characteristics. This component summarizes environmental and socioeconomic baseline characteristics of the Project area, and covers the following critical areas:

- Physical geography
- Geology, seismicity, mud volcanoes, natural hazards

- Climate and meteorology
- Hydrology and water use
- Hydrogeology
- Soil quality and land use
- Air quality, Noise
- Climate change
- Biodiversity
  - ✓ River ecosystems
  - ✓ Terrestrial ecosystems (flora, reptiles and amphibians, mammals, birds)
  - ✓ Ornithology
  - ✓ Fish
  - ✓ Nature Protection Areas
- Solid and liquid wastes
- Ecosystem services
- Landscape visual perception
- Socioeconomic baseline
  - ✓ regional and local context
  - ✓ local stakeholders and communities
  - ✓ Community Health and Safety
  - ✓ Traffic intensity
  - ✓ Historical and cultural heritage

Part C: Impact Assessment. Environmental issues of the OHL construction and operation works primarily include the following:

- Changes of terrestrial and river habitats, biodiversity related impacts, landscape perception, ecosystem services
- Surface and underground water quality
- Air emissions
- Noise, vibration, light contamination
- Climate change
- Waste management
- Hazardous materials and fuel management
- Traffic and transportation routes
- Social infrastructure, health and education
- Economy, livelihoods, incomes and vulnerable groups
- Cultural and historical heritage
- Occupational Health and Safety

Part D: Impact management. This component proposes measures to prevent, resolve, minimize, mitigate or compensate adverse impacts, improve environmental and social performance and maximize positive impacts of the Project.

Part E. Conclusions and Management Plans. This component proposes health, safety, environmental and social management plans that include operational mitigation measures during the construction and operational periods.

1.6. Limitations of the Approach to ESIA

Except for limited volumes of onsite monitoring, sampling and laboratory analysis, this ESIA has been developed primarily based on desktop studies, utilizing existing data and literature reviews. While this approach has allowed for a preliminary assessment of potential impacts, it is recognized that fieldwork and further engagement with stakeholders will be necessary to refine the assessment and develop appropriate mitigation measures.

1.7. Report Structure

Section 1 presents an introduction to the report, its purpose, program and team, along with an overview of the project and the legal and institutional framework to which the project is to adhere.
Section 2 presents the Project description.
Section 3 presents the regulatory framework.
Section 4 presents the ESIA methodology.
Section 5 presents the Project alternatives.
Section 6 presents the environmental Baseline.
Section 7 presents the Socioeconomic Baseline.
Section 8 presents the Stakeholder Engagement
Section 9 presents the Impact Assessment.
Section 10 presents the Environmental and Social management plans.
Section 11 presents the Monitoring and Audit plans.
Section 12 presents conclusions and recommendations of the ESIA.

2. PROJECT DESCRIPTION

2.1. Project background and objectives

In recent years, there has been a growing global focus on transitioning towards renewable energy sources as a sustainable and environmentally friendly alternative to traditional fossil fuels. AzerEnerji recognizes the importance of this transition and has embarked on a strategic initiative to promote the integration of renewable energy into the existing energy infrastructure.

The Project initiative aims to address key challenges and opportunities related to the effective integration of renewable energy sources (solar, wind, hydro) into the energy grid. By leveraging innovative technologies, policy frameworks, and stakeholder collaboration, the project seeks to accelerate the adoption and integration of renewables, contributing to a more sustainable and resilient energy ecosystem.

The Project is a part of Azerbaijan's renewable energy portfolio, currently with 50 MW of wind and 230 MW of solar capacity, and is set to expand by 4 GW through a partnership with Masdar.

“Azerbaijan Scaling-Up Renewable Energy Project” (Hereinafter - The AZURE Project) was initiated by the Government of Azerbaijan (hereinafter - GoA) as a significant undertaking in Azerbaijan aimed at expanding the country's renewable energy capacity and infrastructure. It involves the development of a system for transmitting electricity generated from renewable sources. Key aspects and goals of the AZURE project:

Scaling up renewable energy: The primary objective is to significantly increase the share of renewable energy in Azerbaijan's energy mix. This involves the construction of new solar and wind power plants across the country.

Strengthening transmission infrastructure: To accommodate the increased renewable energy generation, the project focuses on expanding and modernizing the existing electricity transmission network. This includes the addition of new substations andpower lines.
Integrating renewable energy into the grid: The AZURE project aims to ensure the smooth and efficient integration of renewable energy sources into the national grid. This involves addressing technical challenges related to the intermittent nature of solar and wind power.

International collaboration: Azerbaijan is collaborating with international financial institutions, such as the World Bank, to secure funding for the project. There are also discussions with neighboring countries like Uzbekistan and Türkiye about potential cooperation in the renewable energy sector.

Socioeconomic and environmental benefits: The AZURE project is expected to bring numerous benefits to Azerbaijan, including increased energy security, reduced reliance on fossil fuels, lower greenhouse gas emissions, and the creation of new jobs in the renewable energy sector.

The Azerbaijani government, recognizing the importance of scaling up renewable energy and the need for technical and financial assistance, approached the World Bank to explore potential collaboration on the AZURE project. AzerEnerji conducted a thorough assessment of the AZURE project. This assessment involved evaluating the project's technical feasibility, economic viability, environmental and social impacts, and its potential contribution to Azerbaijan's sustainable development goals. It was concluded that the AZURE project aligns with important developmental goals, including promoting sustainable development, supporting economic growth, enhancing energy security and improving access to energy. The Project will be implemented by the “AzerEnerji” JSC. The Project forms part of the AzerEnerji’s Strategic Development Plan.

The Project is of high priority for the GoA to support the country’s green energy transition.

A. AZURE project financed by the World Bank

Component 1: Absheron Wind IPP Connection and Transmission Network Strengthening (US$168.4 million IBRD, including US$18.6 million contingencies). This component will support (i) the construction of a 330 kV transmission connection to evacuate power from the 240 MWac Absheron Wind IPP, and (ii) the 500 kV upgrade of Navahi Substation and related infrastructure for the reliable N-1 evacuation of 1

GW of variable renewable energy connected to the Navahi substation and the enhanced fluctuation management of 1.8 GW of VRE capacity in the system to ensure grid stability.

This component comprises the following (See Figure 1 below):

(b) **Subcomponent 1.1: Connection of Absheron Wind IPP – 330 kV Grid** (US$33.8 million), including: (i) 65 km OHL single circuit 330 kV from Absheron wind plant substation to Navahi substation, (ii) 19 km OHL single circuit 330 kV from Absheron wind plant substation to Gobu PP substation, (iii) 22 km OHL double circuit 330 kV from Navahi substation to Alat substation, and (iv) expansion of 330 kV bays at Gobu PP substation.

(b) **Subcomponent 1.2: 500 kV Strengthening** (US$ 134.6 million), including: (i) 235 km single circuit OHL 500 kV from Azerbaijan TPP substation to Navahi substation (ii) supply and installation of equipment for 500 kV part of Navahi (2x 500 MVA) substation (ii) expanding the 500 kV bays at Absheron and Azerbaijan TPP substations.

Component 2: Project implementation support (US$5.1 million IBRD). This component will finance consulting, capacity building and auditing services to support the PIU in project implementation. The consulting services will comprise a Supervision engineer to assist the PIU with the implementation of component 1 and relevant technical consultants to support the achievement of project objectives. In addition, the component will comprise the expenses of the project's external auditor and capacity building to create an enabling environment to enhance the skills and career prospects of women in the energy sector.

The Government of Azerbaijan (GoA) in partnership with Masdar plans to develop 1 GW of Variable Renewable Energy (VRE), including: (i) the 445 MW Bilasuvar Solar Independent Power Project (ii) the 315 MW Banka Solar IPP, and (iii) the 240 MW Absheron Wind IPP. To adhere to the contractual timelines of the Power Purchase Agreements (PPAs) for the two solar IPPs and expedite the implementation of the necessary connection infrastructure, the GoA will finance the minimal infrastructure required for energy evacuation from the solar IPPs during normal operations. The planned infrastructure includes: (i) a 330 kV substation at Navahi, (ii) a 90 km double-circuit 330 kV transmission line from the Bilasuvar Solar IPP to the Navahi substation, (iii) a 80 km double-circuit 330 kV transmission line from the Banka Solar IPP to the Navahi substation, and (iv) a 65 km 500 kV transmission line from the Navahi substation to the Absheron substation.

The establishment and successful development of the AZURE Project will be an important part of the general policy of GoA, allowing Azerbaijan to become an important exporter of green energy to the international markets, with diversified and export-oriented economy creating high-added value, based on a world class attractive business environment, with modern energy, transportation, and logistical infrastructure. The Project will strengthen AzerEnerji's transmission network, making it more reliable and capable of handling increased power flow and the fluctuating generation from the SPPs. It will enable AzerEnerji with integrated

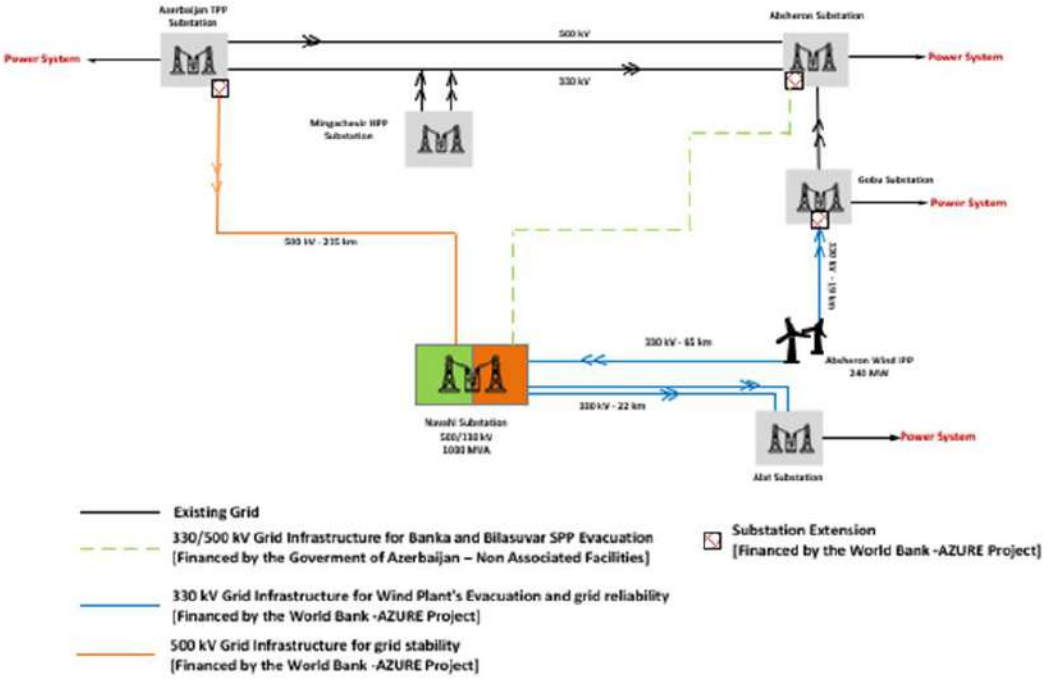
VRE system planning, improve system flexibility, and increase staff capacity to operate and dispatch variable renewable energy.

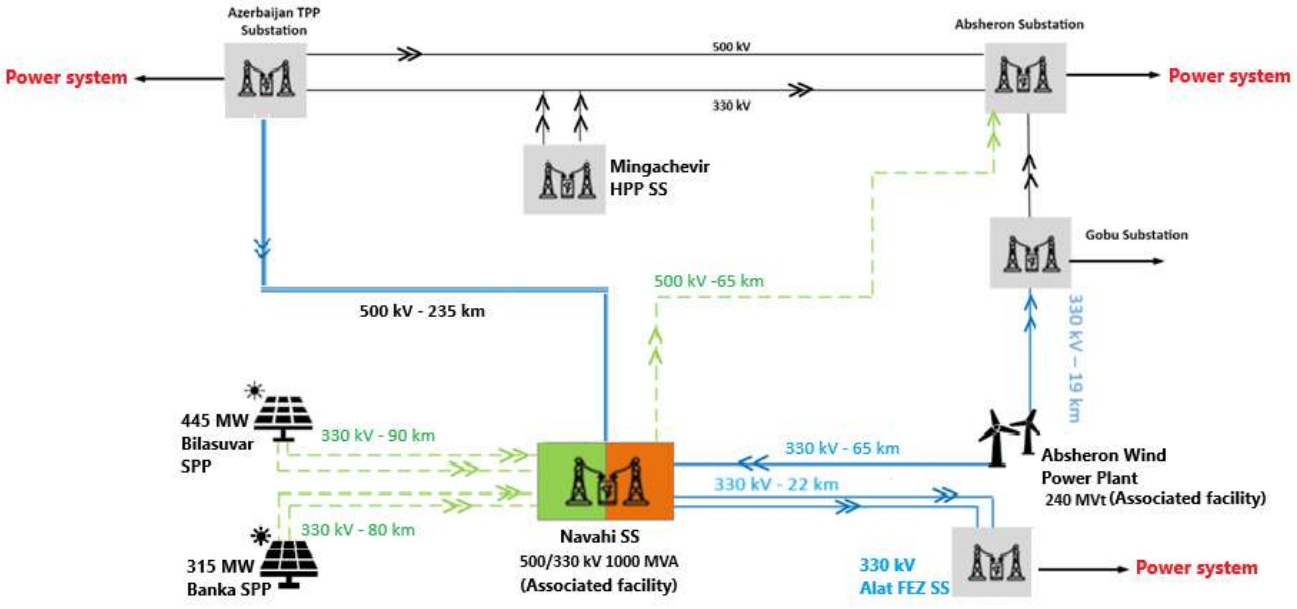
Associated facilities. The 330 kV part of the Navahi substation financed by the Government of Azerbaijan and the Absheron Wind Power Plant financed by Masdar are associated facilities to the AZURE project; accordingly, they would be required to comply with the World Bank Environmental and Social Framework (ESF).

Environmental and Social Framework (ESF). The draft Environmental and Social Impact Assessment (ESIA)/Environmental and Social Management Plan (ESMP), Stakeholder Engagement Plan (SEP), Resettlement Policy Framework (RPF), Labor Management Procedures (LMP) and Environmental and Social Commitment Plan (ESCP) were revised to reflect the finalproject configuration, impact assessment and mitigation measures.

The draft ESIA for the Absheron Wind Power Plant (WPP), including bird monitoring report, is expected to be disclosed by Masdar in April 2025. The draft ESIA will follow the environmental and social policies of Masdar's financiers: ADB, EBRD and AIIB. The Environmental and Social Due Diligence consultants recruited by Azerenerji will be expected to conduct an assessment to identify any gaps with WB's ESF. In case of any divergence, Azerenerji will then be required to update the project's ESIA accordingly.

Figure 2.1: Overview of the AZURE Project scope and associated facilities





Description of infrastructure financed by the AZURE project

The AZURE Project financed by the World Bank will be entirely onshore and consist of the below key activity sets:

1. Connection of the Absheron Wind IPP to the 330 kV Grid:

- 330 kV double-circuit "Alat FEZ SS - Navahi SS" OHL - 22 km
- 330 kV single-circuit "Absheron-Garadagh WPP - Navahi SS" OHL - 65 km
- 330 kV single-circuit "Absheron-Garadagh WPP - Gobu ES" OHL - 19 km
- Expansion of 330 kV bays at Gobu PP substation.

2. 500 kV grid strengthening:

- 500 kV single-circuit "Azerbaijan TPP - Navahi SS" OHL - 235 km
- Supply and Installation of equipment for 500/330/10 kV Navahi SS
- Expansion of 500 kV bays at Absheron substation
- Expansion of 500 kV bays at Azerbaijan TPP substation

The new OHLs are intended to serve two main purposes. First, it will improve reliability of the existing grid. To accomplish this, it will provide necessary backup for existing old lines in the regions that were built in the Soviet period and will help ensure a steady energy supply to west and north-west Azerbaijan and export line to Georgia and Türkiye. Second, the new Navahi substation will increase the capacity for electricity transmission from southern Azerbaijan to western Azerbaijan, and including Alat FEZ, which will further improve reliability of existing supplies. The increase in transmission capacity will be increasingly important as

new renewable projects in southern and central parts of Azerbaijan, as well as ambitious renewable energy projects in newly liberated territories will soon begin to supply additional electricity to the national grid.

AzerEnerji will be responsible for the construction and operation of the energy infrastructure, including OHLs and substations, in line with the requirements of national environmental and social (E&S) regulations and World Bank ESSs. AzerEnerji will provide final engineering design and hire contractors to conduct all civil works and provide and install equipment for the proposed energy infrastructure. AzerEnerji will also hire a supervision consultancy company which will oversee construction and will also monitor the environmental and social compliance of contractor.

2.1.1. OHLs

A. Description of routes

This section provides an overview of existing conditions along the proposed routes for overhead transmission lines.

The routes can be described as follows:

- 235 km length 500 kV single-circuit "Azerbaijan TPP - Navahi SS" OHL runs from Navahi SS to Azerbaijan TPP for evacuation of energy from Navahi SS to Azerbaijan TPP. It will be constructed parallel to Navahi-Mingachevir OHL and has flat and slightly hilly terrain and is easily accessible. It will pass through the administrative territories of Hajigabul, Aghsu, Ismayilli, Goychay, Aghdash, Yevlakh, Mingachevir regions.
- 22 km length 330 kV double-circuit "Alat FEZ SS - Navahi SS" OHL runs from Navahi SS to Alat FEZ SS for evacuation of energy from Navahi SS to Alat FEZ SS. It has flat terrain and is easily accessible. It will pass through the administrative territories of Hajigabul and Garadagh regions.
- 65 km length 330 kV single-circuit "Absheron-Garadagh WPP - Navahi SS" OHL runs from Absheron-Garadagh WPP to Navahi SS for injection of renewable energy to the grid. It has flat and slightly hilly terrain and is easily accessible. It will pass through the administrative territories of Hajigabul and Gobustan regions.
- 19 km 330 kV single-circuit "Absheron-Garadagh WPP - Gobu ES" OHL runs from angle points A1 to A17 for injection of renewable energy to the grid. It has flat and slightly hilly terrain and is easily accessible. It will pass through the administrative territories of Gobustan and Absheron regions.

B. Technical specifications

The distance between the towers will be 250m-300m depending on the relief, as the OHLs are single and double circuit. Depending on the relief, the height of the towers also varies between 40-49 meters. The technical and economic reasoning was taken into account in the selection of towers. The anchor takes up to 95 m^2-190 m^2 of land, depending on the type of support and its resistance in the relief.

Each of the towers is installed on 4 bases. Excavations for tower bases will be limited to the immediate area of the tower legs. At most the footprint of a 500 kV and 330 kV tower would be (about 20 m^2), therefore, the area that would be exposed to the forces of erosion is limited.

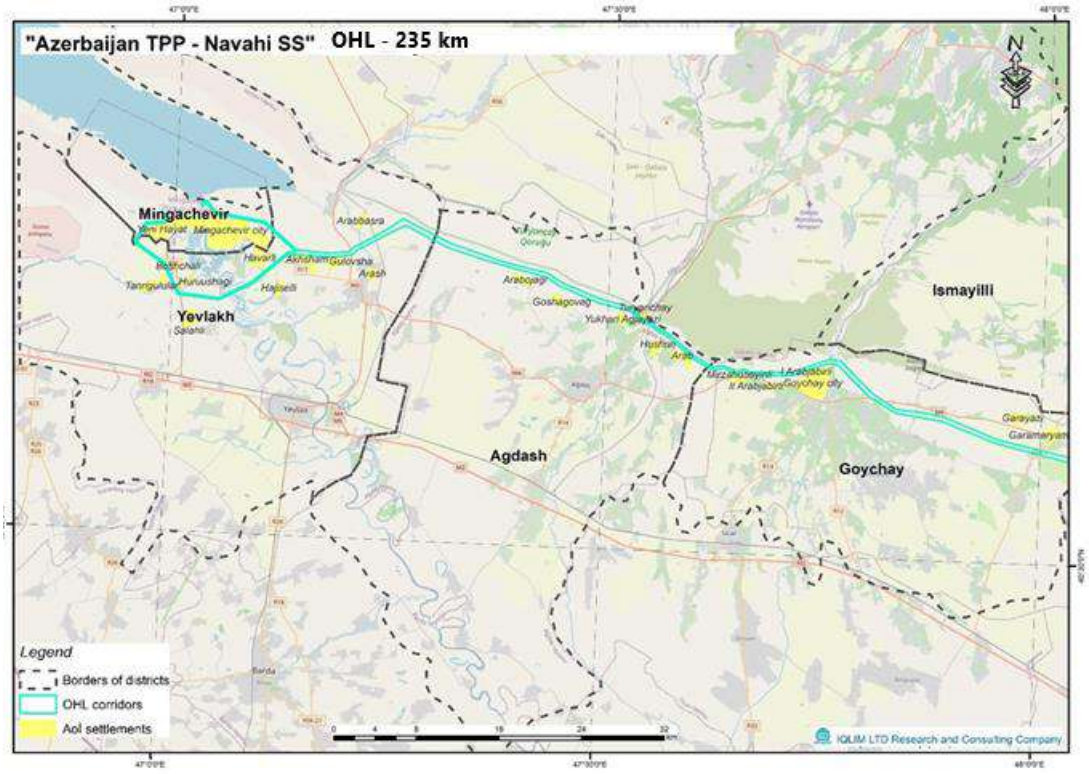


Figure 2.2: Map of "Azerbaijan TPP - Navahi SS" OHL: Mingachevir-Goychay section

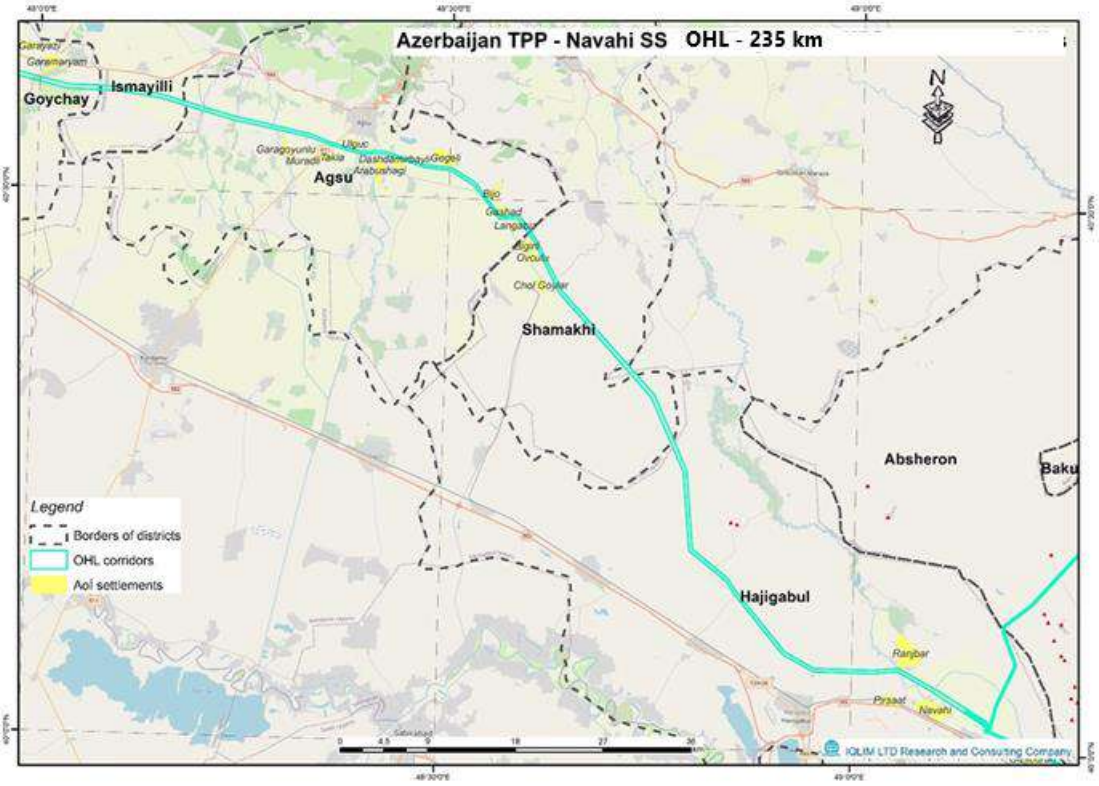


Figure 2.3: Map of "Azerbaijan TPP - Navahi SS" OHL: Goychay-Navahi section

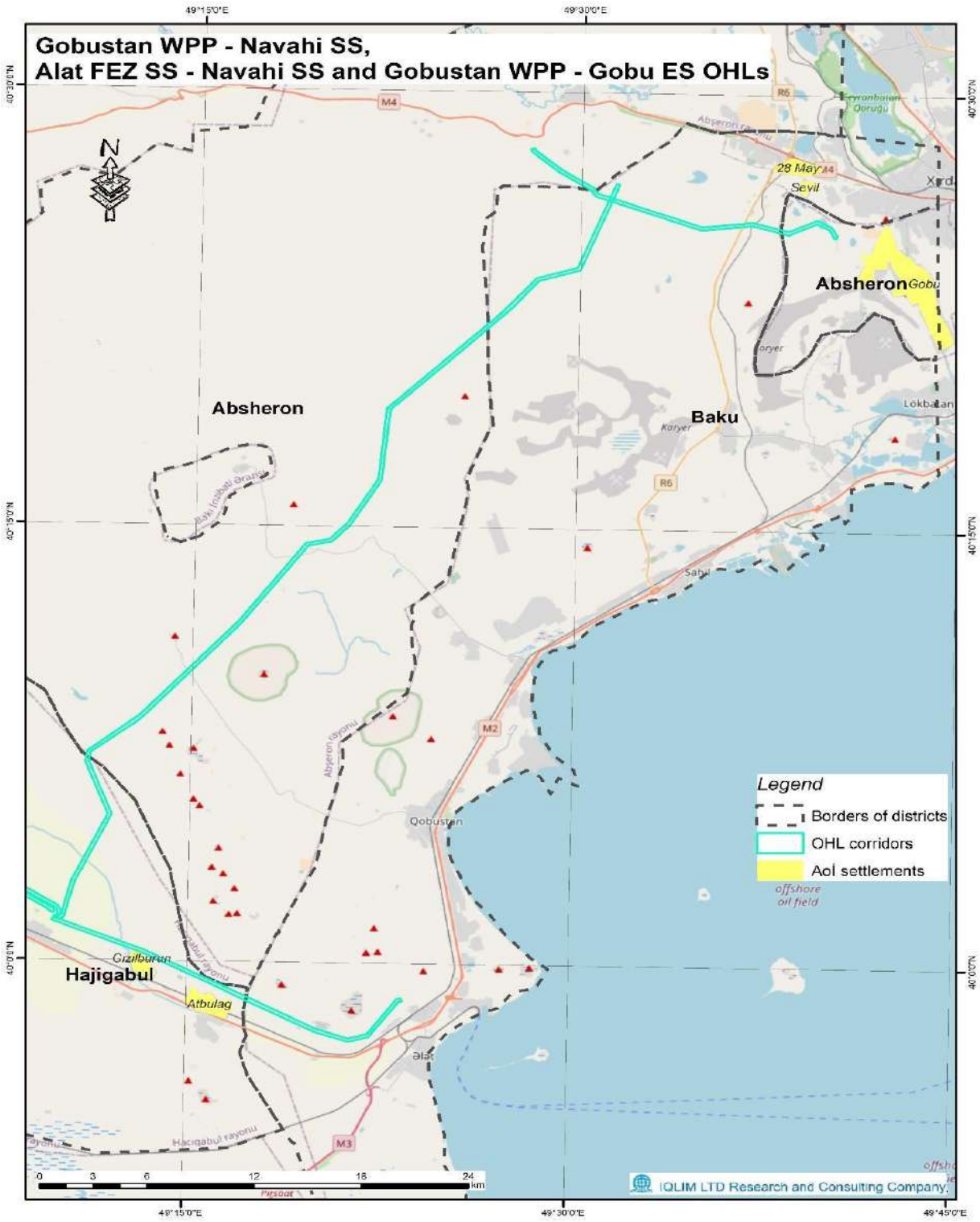


Figure 0.4: Map of "Alat FEZ SS - Navahi SS" OHL, "Absheron-Garadagh WPP - Navahi SS" OHL and "Absheron-Garadagh WPP - Gobu ES" OHL

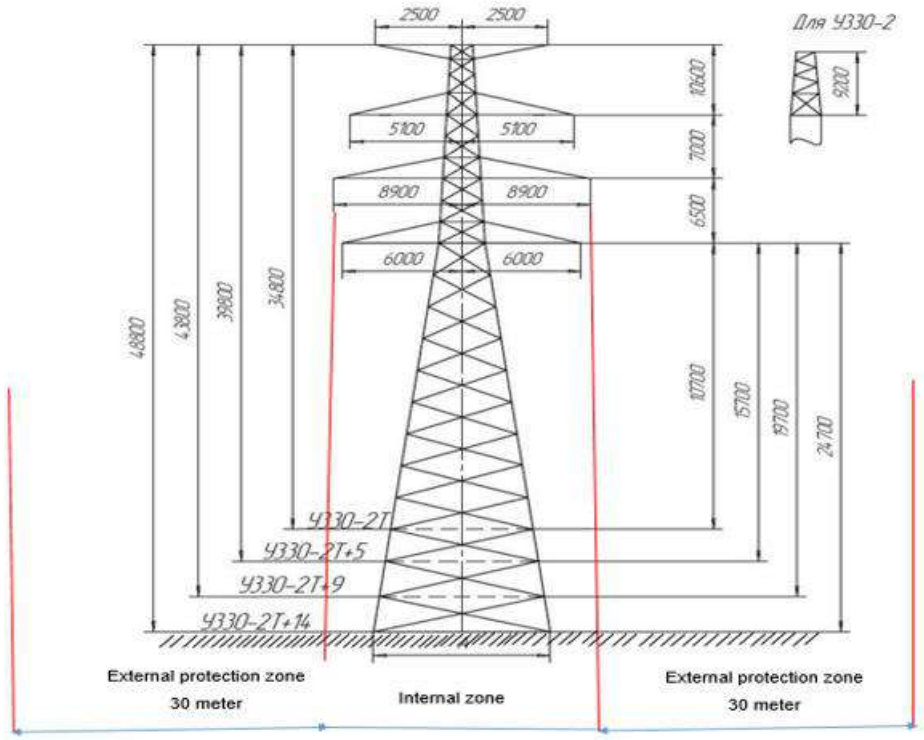


Figure 2.5: Structure of double-circuit 330 kV anchor tower, protection zone and approximate configuration of the corridor

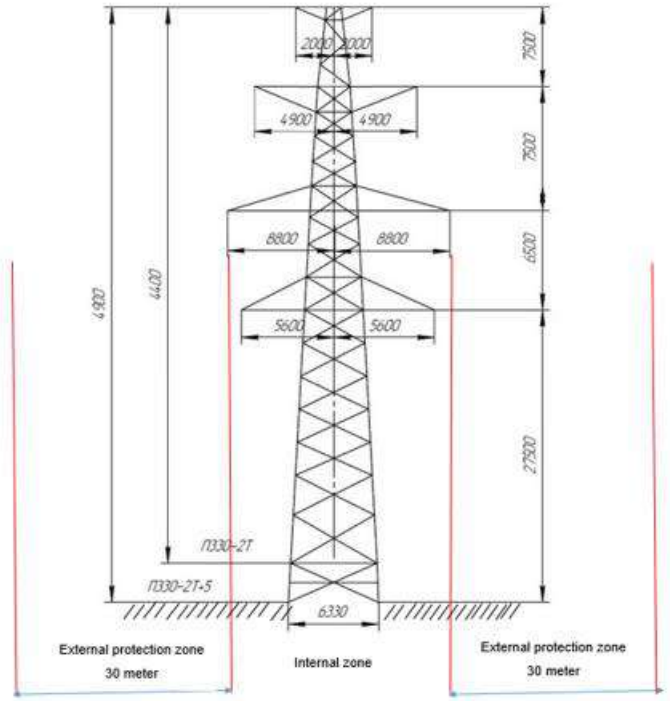


Figure 2.6: Structure of intermediate double-circuit 330 kV support, protection zone and approximate configuration of the corridor

Figure 2.7: A possible general view of the 330 kV double-circuit intermediate tower

Tower parts

Foundations

Installed towers Mounted towers

Figure 2.8: An example of installed and assembled towers

The photos show typical works of OHL construction. After each tower is installed along the route, crews break up the abutment perimeter, ground, soil, etc. it will be levelled, it is made by filling the damaged area with protected soil, and drainage channels are installed if the water flowing from rain causes erosion. Future erosion of plants or plant tissues is prevented. After all the supports are installed, the wires between the supports are laid and tested.

The number of towers and their type as well as the proposed position of each individual tower within the proposed corridor will be identified and confirmed during the upcoming Project reference development stages (detailed design) in line with the relevant Azerbaijani legislation.

The number of conductors and their disposition on each tower type is two circuits with one conductor per phase and one protective wire at the top of the tower.

The maximal footprint area for a tower is approximately up to 100 m2. This land area will need to be permanently acquired in order ensure safe operations and maintenance of the transmission line.
Each tower will have four legs and single foundation per leg, i.e. four foundations for each tower. The foundations will be designed with reinforced concrete blocks with a type of concrete suitable to the specific bearing capacity of the soil, obtained from the respective site-specific geo-technical investigation.

Phase Conductors

The conductors are attached to the cross-arms at OHL towers by insulator strings, which, in the case of suspension towers, hang vertically below the cross-arms. At angle towers the conductors are again attached to the cross arms by insulators but in this case the insulators are in line with the conductors. Conductors for transmission lines are typically manufactured from aluminium with steel core. For the phase conductors for this 110 kV transmission line, pursuant to the current concept in Azerbaijan, Aluminium Conductor Steel-Reinforced (ACSR) conductors will be used with a normal cross section of 240/40 mm2.

Insulators

The transmission line will be connected to the grid with a directly grounded neutral point and nominal lightning impulse with stand voltage of 550 kV.

The insulator that is to be used will be of a type approved for such transmission lines and appropriate assembling procedures will be carried out for the various types of insulator chains. Insulators are typically made of toughened glass.

Earthing

Earthing of the towers will be completed with one ring around each tower foundation and additional Fe (iron) wire ring is laid around the entire tower structure, roughly 1 meter away from existing rings and at depth of 0.8 to 1.0 meter, made from Fe wires of a nominal diameter (Ø) of 10mm. These rings are connected between them and to the tower steel structure. In cases where earthing needs to be reinforced (e.g. for types of soil with lower conductivity), reinforcement is done by adding two legs (extensions) from FeZn wires or FeZn tapes to existing rings on each tower foundation.

Protective Wires

One ground wire will be strung above the towers arms at the tower peak for protection against lightning strikes.

2.1.2. Other Facilities

A. Navahi SS

Navahi SS is geographically located on the eastern side of Navahi settlement in the southern part of Hajigabul region. The land of the area belongs to the state and was given to the use of "AzerBashEnergy" (now "Azerenergy" OJSC) by the Decree No. 166 of the Council of Ministers of the Azerbaijan SSR dated May 18, 1984 (presented in Appendix 3.4 of the State Act). The site was empty when Azerenerji conducted land clearing works in May. The site is located 1.2 km away from Navahi settlement in the north-east of Hajigabul region, 20 km from Hajigabul city, and 90 km from Baku city in the southeast direction. During the Soviet Union, it was planned to build a nuclear power plant in the area. After the accident at the Chernobyl nuclear power plant, the construction of the station was stopped. A brick factory and warehouse buildings are located 500 m from the project area. Baku-Gazakh railway passes 1.25 km away. Figure 4.9 shows project location and 4.10 shows the view of the field.

Construction works started in late September 2024. So far, fencing works, foundation works, storages and bays were completed. The Contractor organized its camp adjacent to construction site with all required infrastructure and conditions for workers. The area is provided with temporary fence and insulated septic tank. Waste management properly handled, all required documents, including site specific ESMP have been prepared.

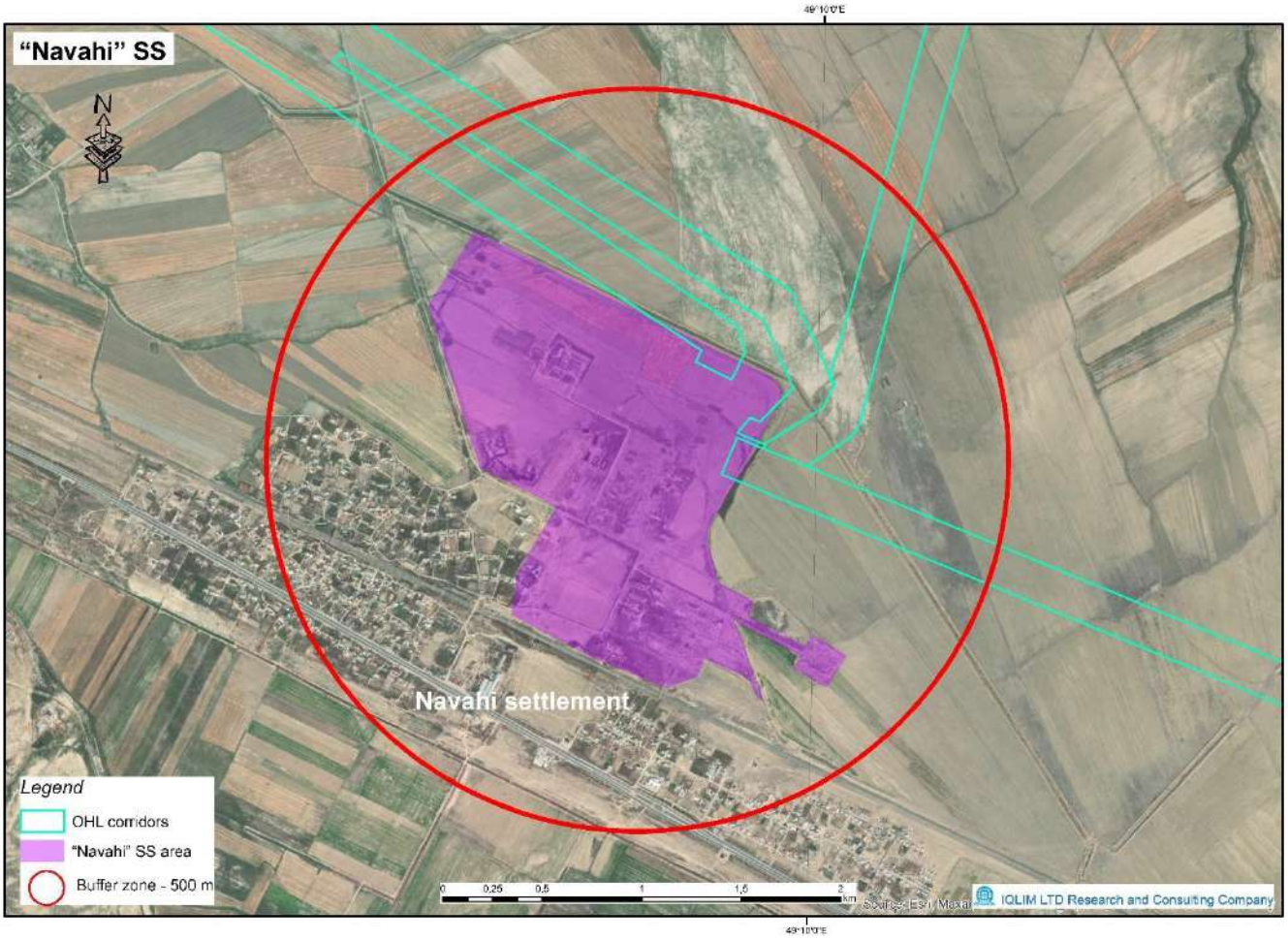


Figure 2.9: Location of Navahi SS

Figure 2.10: Photos from Navahi SS

B. Absheron SS

The substation site is located in the east of Azerbaijan Republic, on the coastal zone of the south-eastern part of the Gobustan plain, in the south-west of the Absheron Peninsula, Absheron administrative region of Baku. The substation will be connected to a new 500kV OHL running to the southwest side of the Project site towards Navahi settlement reaching Navahi substation, to be constructed by AzerEnerji.
"Absheron" energy hub is considered the main base of the energy system not only of Baku and the Absheron peninsula, but also of the country as a whole. Thus, a very large amount of load from the large power plants located in Mingachevir, Shirvan and other cities is transferred to the "Absheron" substation, and from here to the system-important 330, 220 kilovolt substations.

Absheron SS is connected with Azerbaijan's 4 largest thermal power substations - "Azerbaijan" Thermal Power Plant, "Sumgait", "Northern" and "Southern" Power Plant, as well as Mingachevir Hydropower Plant, "Sangachal", "Gobu" Power Plants, "Khachmaz" module type power plant. Thus, this substation is the only nodal substation connected to such large generation sources.

Figure 2.11: Location of Absheron SS

C. Gobu PP

The site of existing 385 MW Gobu Power Plant and the adjacent 330/220/110/10 kV "Gobu" SS is located in the Gobustan-Absheron zone of the Garadagh region, in the northwestern part of the Gobu settlement, on

the western side of the hill called Gosha Yamac. Partially saline gray and gray-brown soils are spread in the area. These lands are spread at an altitude of 16.7-18.3 m above sea level. The characteristic feature of these soils is varying degrees of salinity, high carbonation, presence of 1% humus in the upper layer and the reaction of the solution is strongly alkaline (pH 6.5-6.8). Groundwater environment is 7.1pH. According to its granulometric composition, it is medium granular sand. They are sodium-magnesium soils. Strong water and wind erosion is observed. It should be taken into account that the erosion hazard here is more than 30%. Soil bonitet score is 42. Currently 200 people is working at the station and associated substation.
The substation will be connected to a new 330kV OHL running to the southwest side of the substation towards Absheron-Garadagh WPP (to be constructed by Masdar) and further to Navahi settlement reaching Navahi substation, to be constructed by AzerEnerji.

Figure 2.12: Location of Gobu PP and associated SS

2.2. Description of project activities

2.2.1. Social and transport implications

OHLs. The construction of pylons for the 500 kV and 330 kV OHLs and the associated easement restrictions are expected to have significant social impacts on affected communities. The land take required for the installation of pylons may lead to loss of some portion of agricultural land, which maybe an important source of livelihood for many local families.

The Project, particularly its OHLs (subprojects 2 and 3) will trigger land acquisition for the foundations of towers. The occupied land parcels will vary from 64 m2 to 100 m2 depending on the tower type (intermediate or anchor tower). The tables below indicate the number of parcels, households and PAPs affected by OHLs.

Azerenerji prepared and disclosed a Resettlement Policy Framework (RPF) for AZURE Project, consistent with requirements of the World Bank Environmental and Social Framework (ESF). Its fundamental purpose is to establish terms of agreement between relevant authorities in the Republic of Azerbaijan and the World Bank regarding principles and procedures to be used in subsequent preparation of a Resettlement Action Plan (RAP) or Resettlement Action Plans (RAPs). World Bank approval of a RAP (or RAPs) is required before project authorities invite bids for any contracts in which works are expected to involve physical or economic displacement as a result of land acquisition or restrictions on access or use of natural resources. The number of parcels and households affected by land acquisition plans of the Project is provided in the table below.

Table 2.1. Number of parcels and households affected by the AZURE Project

No	OHL's name	Length	Number of affected parcels		Number of		
			Property	Rental*	Households	Household members	Tenants
1	500 kV single-circuit "Azerbaijan TPP - Navahi SS"	235 km	437	138	314	1241	9
2	330 kV single-circuit "Absheron-Garadagh WPP - Navahi SS" OHL	65 km	12	9	9	45	3
3	330 kV single-circuit "Absheron-Garadagh WPP - Gobu ES" OHL	19 km		5			2
4	330 kV double-circuit "Alat FEZ SS - Navahi SS" OHL	22 km	19	9	9	69	2
TOTAL			**468**	**161**	**332**	**1355**	**16**

Furthermore, the easement zones established around the OHL will impose restrictions on land use, limiting activities such as building construction, tree planting, and certain agricultural practices. These restrictions can disrupt community development plans, hinder local businesses, and affect the overall quality of life for residents. Property values in the vicinity of the transmission line may also be negatively impacted due to the visual intrusion and perceived health risks associated with high-voltage power lines.

Erection of new towers/poles and lines occurs in a progressive manner from location to location such that traffic disruption along the roads where construction crews are unloading materials from trucks will be minor. The contractors will be required to post warning signs and manage traffic to protect the travelling public and its workers as necessary.

In the event that stringing conductors presents a possible risk to traffic on roads or rivers, scaffolds will be constructed to protect pedestrians and vehicles (and the conductor itself) from potential injury /damage during conductor stringing. Contractors will be required to ensure that existing access ways to public and private amenities are maintained throughout the construction period.

Substations. Construction of new substation facilities will be implemented on land slots owned by AzerEnerji, and, therefore, will not imply any interference with third-party lands and facilities.

The proposed new substation site is accessible by public roads and construction traffic to and from the site will be minimal and periodic in nature. The contractors will be required to post signs and manage traffic to protect the travelling public and its workers as necessary. Contractors will be required to ensure that existing access ways to public and private amenities are maintained throughout the construction period.

2.2.2. Land clearing and excavation

Substations. Construction of additional facilities in the substations will require very limited excavation works will be required and confined to soil removal and platform preparation for towers, transformers and substation structures/switchyards etc.

Measures to minimize erosion and sedimentation will be incorporated into contract documents. These will include minimizing removal of existing vegetation and topsoil, re-surface any areas where excavation works are done. Topsoil disturbed during the development of sites will be used to restore the surface of the excavated area. Infertile and rocky material will be dumped at designated, licensed dumping areas or where applicable, used as fill material.

OHLs. Information on soil clearing requirements of the Project OHLs is provided in the tables below.

Table 2.2. Land requirements of overhead transmission lines

No	Tower type	Tower quantity	Land area occupied by 1 tower (sq.m)	Total occupied land area (sq.m)
Azerbaijan TPP - Navahi SS OHL				
1	У2+5	250	300	75000
2	ПБ4	535	230	123050
Total		880		198050
Absheron-Garadagh WPP – Gobu PP OHL				
1	У330-3+9	2	120	240

2	У330-2+5	8	110	880
3	ПС330-5	36	65	2340
4	У330-1+9	14	120	1680
5	У330-1+14	2	150	300
6	У330-3	16	70	1120
7	У330-1+5	17	95	1615
Total		95		8175
Gobu PP – Navahi SS OHL				
1	У330-3+9	2	120	240
2	У330-2+5	8	110	880
3	ПС330-5	153	65	9945
4	У330-1+9	27	120	3240
5	У330-3	30	70	2100
6	У330-1+5	46	95	4370
Total		266		20775
Navahi SS - Alat FEZ SS OHL				
1	У330-3+9	2	120	240
2	У330-3+5	1	95	95
3	ПС330-5	63	65	4095
4	У330-1+9	2	120	240
5	У330-3	1	70	70
6	У330-1+5	15	95	1425
Total		84		6165

In 330 kV OHLs the height of the foundations of intermediate supports is 3.20 m. The height remaining under the ground is 3 m, whereas 20 cm remains above the ground. In 330 kV OHLs the height of the foundations of anchor supports is 3.115 m. The height remaining under the ground is 2.85 m, whereas 26.5 cm remains above the ground. Therefore, the excavation depth of the soils will amount to 2.85-3.0 m depending on the type of foundations.

In 500 kV OHLs the height of the foundations of intermediate supports is 2.70 m. The height remaining under the ground is 2.50 m, whereas 20 cm remains above the ground. In 500 kV OHLs the height of the foundations of anchor supports is 3.115 m. The height remaining under the ground is 2.85 m, whereas 26.5 cm remains above the ground.

Although the total volumes of land clearing and excavation works of the Project is expected to be large, at the local scales they will involve minimal excavation that could contribute to soil erosion and the potential for sedimentation of watercourses. Excavation will be mainly limited to auguring of four holes for each lattice tower concrete support bases in the impact corridor.

Excavations for tower bases will be limited to the immediate area of the tower legs. At most the foot print of a 500 kV and 330 kV tower would be (about 20 m2), therefore, the area that would be exposed to the forces of erosion is limited.

As much as possible existing line maintenance tracks will be used to access the tower/pole sites.

Measures to minimize erosion and sedimentation will be incorporated into contract documents. These will include minimizing removal of existing vegetation and topsoil, re-surface any areas where excavation works are done. Topsoil disturbed during the development of sites will be used to restore the surface of the excavated area. Infertile and rocky material will be dumped at designated dumping areas or where applicable, used as fill material.

2.2.3. Vehicles and equipment

The construction activities will involve temporary and periodic use of powered mechanical equipment over short time periods with much of the work carried out using manual labour. The main noise and dust generating activities will be associated with minor excavation for platform preparation and periodic transport of materials and equipment to the sites. The potential impact of noise, dust emissions and air pollution on nearby communities from these activities are expected to be minor, and periodic in nature. However, good construction practice to minimize these impacts shall be specified in contract documents.

2.2.4. Water management

During construction phase, wastewater will arise from domestic sewage from site workers, contamination due to spillage of oil and other lubricants, contamination due to disposal of construction wastes and wastewater from washing of construction equipment and vehicles. Such wastewater if not properly controlled has the potential to pollute nearby water bodies namely drainage channels and irrigation canals.

The contractors will be required to implement measures to prevent wastewater produced during construction from entering directly into the adjacent drainage channels and irrigation canals. Such measures shall include:

- Provision of adequate on-site sanitation facilities including septic tanks and soak-away pits or alternative sanitary facilities that do not allow untreated disposal of sewage to adjacent water bodies
- Provision of an appropriate domestic solid waste and construction waste collection and disposal system
- Provision of bunded hard standing areas for equipment servicing, refuelling and wash down where drainage is directed through oil and grease interceptors before being discharged into a settling pond prior to discharge into offsite drainage channels.
- Implementation of good operation and maintenance practices for construction equipment
- Preparation of an oil spill response plan

Proper implementation of the above measures will ensure that the potential water quality impacts during construction will be insignificant.

2.2.5. Labour, schedule and working conditions

The Project envisages hiring permanent and temporary workforce the construction, operation and maintenance of the substation and overhead lines. AzerEnerji will select contractor(s) for the design, supply, installation and commissioning of the Project facilities through tender procedures. Due to the size of the contract and the expertise required to carry out the design and construction works, it is expected that construction contracts will be awarded to international or local companies and/or be supported by Azerbaijani subcontractors.

The exact number of project workers to be involved in the project is not yet known. The tender documents for the supply, installation and commissioning of OHLs and substation are currently being developed by AzerEnerji. The number of workers involved in the construction phase is expected to be based on the experience gained from similar projects implemented in Azerbaijan and around the world. It is estimated that the total number of workers for the construction of the new transmission line will be 150-200 people, and about 100-150 people for the substation. No more than 150 people are expected to be involved at any construction site.

The construction phase of the Project is expected to last approximately 30 months. At least two main crews responsible for transmission line construction will each consist of teams for land clearing, foundation excavation, foundation installation, piling and erection, conducting (i.e., running wires between piers), and soil remediation. About fifty percent of the workforce will be in semi-skilled and unskilled positions such as managers, engineers, supervisors, drivers and equipment operators and electricians. Similarly, most of the substation construction workers will be unskilled, at least initially. Once the ground is cleared and the foundations are installed, the electrical equipment will be installed by more qualified personnel.

Workers will be accommodated in the special construction camps situated on the territories of the following facilities operated by AzerEnerji: Azerbaijan TPP, 220 Kv Aghdash SS, 220 Kv Aghsu SS, Navahi SS, Alat FEZ, 220 Kv Sangachal SS, Absheron-Garadagh WPP and Gobu SS. Each camping site will occupy no more than 1 ha of the respective facility's territory. Design of the camps will be developed later before the commissioning of the construction phase. However, it is known that all premises will be of a modular structure, not requiring any land clearing or excavation during their construction. Location map of the facilities is provided in Figure below.

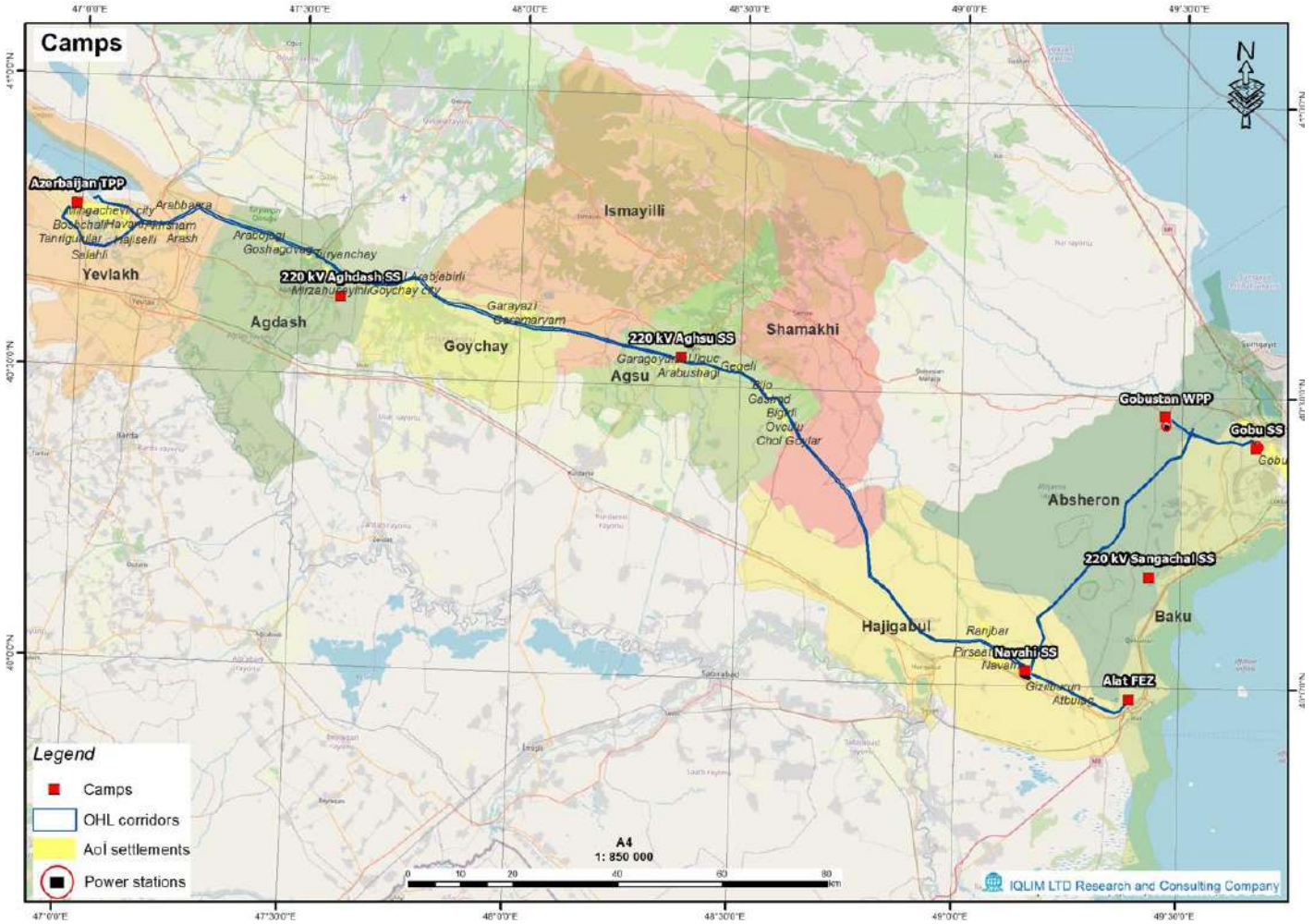


Figure 2.13. Construction camps situated on the territories of the facilities owned by AzerEnerji

It is expected that the Project will involve the following categories of project staff defined by ESS2 of the World Bank's Environmental and Social Framework:

Operational staff: this workforce category includes members of the PIU created for the management of the project on a daily basis (Operational staff), project managers and related specialists (procurement, safeguards, engineers) who are employees of AzerEnerji. The approximate number of operational staff may not exceed 10 people from the international projects department, technical department, transfer and permits department and legal department (if necessary). It is estimated that direct employees will include current Azerenerji employees from various departments to be assigned to work on this Project, and 2-3 new employees may be hired if needed for community-related work. It is expected that the operational staff will include permanent staff seconded to the Project sites and independent consultants specializing in certain professional areas (e.g. social risk management and community relations). These consultants will be employed on the basis of individual contracts, on a part-time basis, with a specific definition of assigned tasks and responsibilities.

Contracted workers will be employed by the design, supply, installation and commissioning contractor(s). Since the tender includes four lots (three lots for OHLs and one for substation), it is likely that four separate contracts will be awarded: Three contractors will design and build the transmission lines, and one contractor will design and build the Navahi substation. Each contractor may be required to engage several subcontractors. The workforce of subcontractors will also be considered contract employees.

Contracted workers will be employed by the design, supply, installation and commissioning contractor(s). Since the tender includes four lots (three lots for OHLs and one for substation), it is likely that four separate contracts will be awarded: Three contractors will design and build the transmission lines, and one contractor will design and build the Navahi substation. Each contractor may be required to engage several subcontractors. The workforce of subcontractors will also be considered contract employees. The project issContracted workers will be employed by the design, supply, installation and commissioning contractor(s). Since the tender includes four lots (three lots for OHLs and one for substation), it is likely that four separate contracts will be awarded: Three contractors will design and build the transmission lines, and one contractor will design and build the Navahi substation. Each contractor may be required to engage several subcontractors. The workforce of subcontractors will also be considered contract employees. The project is estimated to involve between 200 and 250 contracted workers.

Community workers will not be directly employed in connection with this Project. However, the project will give preference to local workers who reside in a particular geographic area, typically near the project sites. Local workers may include skilled and unskilled laborers, technicians, administrative staff, and professionals employed by the project or engaged through local subcontractors.

Primary supply workers: Where local suppliers are involved, contractors are required to carry out due diligence to determine whether there are significant risks of the suppliers exploiting child or forced labor or exposing workers to serious safety issues. When contracting with external suppliers, contractors will be required to ask during the procurement process whether the supplier has been charged or sanctioned for any of these issues, as well as their corporate requirements regarding child labor, forced labor and safety. If any risks and safety related to child and forced labor are identified, AzerEnerji will develop procedures to address these risks.
In terms of point of origin of the labor complement, Priority will be given to hiring local workers, particularly those impacted by the project. A quota of 20% of the total workforce will be allocated to local hires. Besides local workforce, workers from other regions of Azerbaijan and possibly from other countries are expected to participate in the project. Previous experience with power line projects of AzerEnerji shows that the contractor and subcontractors will probably hire workers from different regions of Azerbaijan; these workers already have experience working on high-voltage power lines in different parts of the country.

Job openings will be advertised through local job centers, community organizations, online job portals, and local media. The recruitment process will adhere to principles of non-discrimination and equal opportunity, ensuring diversity and inclusion in the workforce.

Foreign workers are also likely to be employed and are likely to be managerial and skilled technical staff. In addition, there may be several household workers (cleaning, cooking, etc.) from neighboring regions within Azerbaijan. The number of migrant workers will depend on the decisions made by the contractors.
Given the nature of the project workforce (mainly unskilled and semi-skilled construction workers) and the characteristics of the labor market in Azerbaijan, the number of female workers is not expected to be large. As indicated, women are estimated to make up about 5-10 percent of the workforce and will be technical (engineers) and/or workers (maids, cooks, cleaners, etc.) working in operational offices and camps.

Based on experience under the ongoing projects of AzerEnerji aimed to strengthen the transmission grid, all workers will be over 18 and would likely average 25-50 years old.

Azerenerji has a Corporate Social Responsibility Policy where SDG No. 5 "Gender Equality" and No. 10 "Reduction of Inequality" are reflected in the activities of the Company. Azerenerji provides universal services to everyone and adheres to the principles of universality, inclusion and accessibility in its activities. In addition, Azerenerji promotes and protects gender equality in all its operations and activities. The Company focuses on women's social protection and employment and promotes gender equality in human resources policy.

AzerEnerji and its subcontractors will provide all necessary safety appliances such as safety goggles, helmets, masks, boots, gloves etc. to workers and staff. Adequate precautions will be taken to prevent danger from electrocution. Measures such as signboards, danger/red lights, fencing and lights will be provided to protect the public and workers. The contractors will be required to submit Labour Management Plans for approval prior to commencement of construction activities. In addition, the contractors will be required to provide adequate health and safety training for workers.

The construction workforce and the public will face several safety risks due to accidents during construction. These include inter alia: explosions, falls from towers and buildings, unsafe power supply and equipment failure. Potential health risks include inadequate sanitation and communicable diseases. To minimize such risks AzerEnerji will ensure that contractors comply with statutory requirements for worker and public safety related to electric power infrastructure and other internationally recognized safety guidelines.

More detailed information on the labour management procedures of the AZURE Project is provided in the “Labour Management Procedures” (Annex 7).

2.2.6. Emergency response

Within the course of the project, emergency response services will be notified of the location, scope, and any potential hazardous materials encountered during the implementation of construction and maintenance activities. AzerEnerji will enforce emergency response procedures to address any unforeseen incidents during the Project operations. Accidents may include, but are not limited to:

- Collapse or the possibility of collapse of a structure
- Fire and explosion
- Industrial accidents

- Spilling and leakage of hazardous materials
- Electrocution, etc.

Emergency response procedures prioritizing the safety of individuals and minimizing environmental impact will be strictly adhered to. These include:

1. **Prioritizing Human Safety**: The immediate safety of all personnel involved in or affected by an accident is paramount. All necessary measures, as outlined in the Occupational Health and Safety Plan, will be implemented to ensure their well-being.
2. **Minimizing Environmental Damage**: Following the safeguarding of personnel, immediate action will be taken to mitigate environmental damage. Emergency measures will be deployed promptly to contain and minimize any adverse effects.
3. **Notification of Responsible Parties**: Upon ensuring the safety of individuals and initiating damage control measures, the Contractor's Environmental supervisor and/or the Environmental Coordinator (EC) or their designated representatives will be promptly notified of the incident.

These procedures aim to effectively manage emergencies, ensuring a swift and coordinated response that prioritizes both human safety and environmental protection.

2.2.7. Community interaction

Regular engagement with the local communities will be conducted to inform them about the project's SEA/SH policies and reporting mechanisms. Community members will be encouraged to report any SEA/SH incidents involving project workers.

Worker Conduct Training: Workers will receive specific training on appropriate behavior when interacting with community members. This training will emphasize respect, cultural sensitivity, and the importance of maintaining professional boundaries.

Collaboration with Local Authorities: The project will work closely with local authorities and community leaders to address SEA/SH issues promptly and effectively. Joint efforts will be made to raise awareness and foster a safe environment for both workers and community members.

Monitoring and Evaluation: Continuous monitoring and evaluation of SEA/SH risks will be conducted to identify potential issues and implement corrective actions. Feedback from the community will be incorporated into this process to ensure ongoing improvement.

Public Awareness Campaigns: The project will support public awareness campaigns to educate the community about SEA/SH, promoting a culture of zero tolerance and encouraging collective action against such behaviours.

2.3. Potential Interference of the Project Components with Sensitive Impact receptors

The below paragraphs will brief about potential areas where the different Project facilities will potentially interfere with various sensitive impact receptor categories. In order to make the acquaintance with the provided data easier, the information will cover both environmental and socio-economic impact receptors, including environmental parameters, ecosystems, local communities and cultural-historical heritage sites.

2.3.1. 500kV Transmission Line

For both of these subprojects the works involve construction of transmission lines and installation of poles/towers with wires. In some sections the new lines will go in parallel to existing transmission lines operated by AzerEnerji. The lines pass through inhabited and uninhabited areas, agriculture fields and open steppe habitats where land use is unlikely to change in the foreseeable future. Impact on land value is expected subject to verification during detailed ESIA process.

Impacts to migratory and resident birds. Azerbaijan provides breeding and wintering habitats, along with key migration corridors, for a rich diversity of bird species, some of which are globally threatened. Power lines, (including the AZURE-supported new transmission lines) pose a fatal collision risk to birds that accidentally fly into them. Large, heavy-bodied birds are particularly vulnerable to such collisions. In Azerbaijan, the birds considered to be most vulnerable to power line collisions are (i) Little Bustards *Tetrax tetrax*, for which Azerbaijan is a globally significant wintering ground; (ii) large wetland birds such as storks, flamingos, cranes, pelicans, swans, geese, and ducks; and (iii) raptors including vultures, eagles, hawks, and falcons. Raptors are also vulnerable to electrocution when they attempt to perch on power distribution lines (and simultaneously touch a grounded and an electrified element, or two electrified elements); however, this impact is highly unlikely with the specific types of pylons to be used for the AZURE transmission lines. Disturbance from nearby power line construction could also adversely affect the nesting success of sensitive species. The ESIA has identified sensitive segments of the 500 kV line where specific mitigation measures will be used to minimize bird collisions and potential nesting disturbance.

Impact to social and economic values. The construction of the 500 kV OHL is expected to intersect various areas of significant social and economic value, which necessitates careful consideration and management. Key areas of concern include agricultural lands, residential communities, and culturally significant sites. The transmission line route traverses agricultural regions that are important to local food production and livelihoods. Disruption to these areas could result in economic losses for farmers and reduced agricultural output. Cultural heritage sites (Aghsu Town Medieval Archaeological Tourism Complex and Gobustan Mud Volcanos) along the proposed route must also be protected to preserve local traditions and history. Social Impact Assessment (SIA) has been conducted to identify and evaluate these impacts, incorporating stakeholder and focus group consultations to gather input from affected communities and other relevant parties. Mitigation measures, including rerouting, compensation, and community benefit programs, will be developed to minimize adverse effects and ensure that the project contributes positively to the socio-economic landscape.

Interference with other utilities and traffic. As per regulations enacted by Government of Azerbaijan, it is mandatory for AzerEnerji to seek requisite clearance prior to construction from agencies like departments of railways, roads, telecommunication, and wherever necessary, from aviation authorities that could be affected by the construction of power distribution lines. However, it is unlikely that the new lines will result in any interference with other utilities and traffic over and above the current situation.

Whenever the distribution line crosses a railway track, clearance will be sought from the railways department. The new lines will be planned and executed in such a way that adequate clearance is maintained between the distribution lines and railways, civil aviation and civil defence installations. Wherever the distribution lines pass by airports, the poles/towers beyond a specified height are painted in alternate orange and white stripes for easy visibility and warning lights are placed at the top of these towers.

Interference with water drainage patterns. As the lines are constructed aerially and the blockage of ground surface is limited to the area of tower footings, which is very small, impacts on drainage patterns will be negligible. In the infrequent instances where drainage is affected, flow will be diverted and guided to safe zones.

Construction of access roads. There will be no need for construction of access roads for the transmission lines. Clearing and maintenance of access roads for vehicles and equipment to drive to tower locations. Wherever possible, existing roads and tracks will be used. Where necessary, access roads will be constructed. Establishment of roads may require creation of tracks across open land or bulldozing a path. To perform repairs and maintenance, vehicles and equipment may need to come to tower locations. As with initial construction, existing roads and tracks will be used where possible; in some cases, however, temporary roads may need to be used. Any damage to land that occurs during repair and maintenance operations will be reinstated when activities are complete.

2.3.2. 330 kV Transmission Line

The works involve construction of transmission lines and installation of poles/towers with wires. In some sections the new lines will go in parallel to existing transmission lines operated by AzerEnerji. The lines pass through inhabited and uninhabited areas, agriculture fields and barren lands where land use is unlikely to change in the foreseeable future. Impact on land value is expected subject to verification during detailed ESIA process.

Impacts to migratory and resident birds. As with the 500 kV line, the AZURE-supported 330 kV lines pose a collision risk to migratory and resident birds. The ESIA has identified sensitive segments of the 330 kV lines where mitigation measures will also be applied to minimize bird collisions.

Impact to social and economic values. The construction of the 330 kV OHLs is expected to intersect various areas of significant social and economic value, which necessitates careful consideration and management. Key areas of concern include agricultural lands, residential communities, and culturally significant sites. The transmission line route traverses agricultural regions that are important to local food production and livelihoods. Disruption to these areas could result in economic losses for farmers and reduced agricultural

output. Cultural heritage sites (Aghsu Town Medieval Archaelogical Tourism Complex and Gobustan Mud Volcanos) along the proposed route must also be protected to preserve local traditions and history. Social Impact Assessment (SIA) has been conducted to identify and evaluate these impacts, incorporating stakeholder consultations to gather input from affected communities and other relevant parties. Mitigation measures, including rerouting, compensation, and community benefit programs, will be developed to minimize adverse effects and ensure that the project contributes positively to the socio-economic landscape.

Interference with other utilities and traffic. As per regulations enacted by Government of Azerbaijan, it is mandatory for AzerEnerji to seek requisite clearance prior to construction from agencies like departments of railways, roads, telecommunication, and wherever necessary, from aviation authorities that could be affected by the construction of power distribution lines. However, it is unlikely that the new lines will result in any interference with other utilities and traffic over and above the current situation.

Whenever the distribution line crosses a railway track, clearance will be sought from the railways department. The new lines will be planned and executed in such a way that adequate clearance is maintained between the distribution lines and railways, civil aviation and civil defence installations. Wherever the distribution lines pass by airports, the poles/towers beyond a specified height are painted in alternate orange and white stripes for easy visibility and warning lights are placed at the top of these towers.

Interference with water drainage patterns. As the lines are constructed aerially and the blockage of ground surface is limited to the area of tower footings, which is very small, impacts on drainage patterns will be negligible. In the infrequent instances where drainage is affected, flow will be diverted and guided to safe zones.

Construction of access roads. Existing access roads will be used to transport wires and towers to their locations along the alignments of 330kV OHLs.

2.3.3. 500/330/10kV Navahi Substation

This subproject involves construction of a new substation within the boundary of the land parcel owned by AzerEnerji. The site is located in rural area with low environmental values. No impact on land value is expected and the site has largely been cleared and grubbed.

No encroachment into precious ecological areas or areas of historical / cultural value. There are no significant sensitive receptors including ecologically sensitive areas or historical / cultural monuments nearby the substation site that will be impacted from the construction or operation of the substation.

Interference with other utilities and traffic. As per regulations enacted by GoA, it is mandatory for AzerEnerji to seek requisite clearance prior to construction from agencies like departments of railways, roads, telecommunication, and wherever necessary, from aviation authorities that could be affected by the construction of power transmission infrastructure. Given that the new substation will be constructed within

the boundaries of an existing land parcel owned by AzerEnerji, no significant interference with other utilities and traffic is expected.

Interference with water drainage patterns. Construction of new substation infrastructure within the boundaries of land parcel owned by AzerEnerji will include provision of effective drainage design such that there will be minimal changes to the natural flow of storm water entering and leaving the site. Drainage will be designed to route water runoff from the substation to designated places to avoid flooding of access roads and nearby areas. Storm water management shall conform to governmental agency requirements. No significant impacts on water drainage patterns is expected.

Construction of access roads. The road heading to the brick factory located at 500 meter distance from the Navahi substation is the access road to the Project site which is branched from Alat-Gazakh-Georgian Border Highway. It will be necessary for the access road (app. 150 m) to be asphalt paved along its full length to allow HGV traffic (transport trucks, supply or large equipment, etc) to access the site.

2.3.4. Expansion works in existing substations

In all cases the sub-projects involve installation of new extension bays within the boundaries of existing substations.

There will be no encroachment into precious ecological areas or areas of historical / cultural value such that there will be no impacts on these values. All of the expansion works will be implemented and the bays will be installed within the territory of the existing substation.

There will be no impacts on other utilities and traffic. Rather, any existing impacts on other utilities due to the current condition of these service lines will be mitigated by the rehabilitation works.

There will be no impacts on water drainage patterns resulting from these subprojects.

No new access roads will be required since all lines are within existing access roads of the substations.

3. REGULATORY FRAMEWORK

The ESIA study for the AZURE Project was carried out considering the requirements of national regulations and the Environmental and Social Standards (ESSs) of the World Bank Environmental and Social Framework (ESF). This chapter outlines national institutional framework, policy and legislation requirements pertinent to the Project as well as WB ESSs relevant to the Project.

3.1. Constitution

The Constitution is the highest law in the Azerbaijan Republic that prevails over national legislation and international agreements. The following Articles help determine the applicability of national and international requirements for the energy sector:

> **Article 148.II -** International agreements acceded Azerbaijan Republic become an integral part of the legislative system of Azerbaijan;
> **Article 151** - If any conflicts arise between the normative-legal acts which constitute the legislative system of Azerbaijan (except for the Constitution and the acts adopted via referendum) and the international agreements acceded to by the Azerbaijan Republic, the provisions of the international agreements shall apply.

The Constitution of Azerbaijan does not contain specific provisions explicitly addressing energy. However, several articles indirectly relate to the management and utilization of natural resources, which include energy resources:

Article 12 (Ownership): This article establishes the forms of ownership in Azerbaijan, including state, private, and municipal ownership. This is relevant to energy resources, as the state typically owns and manages significant energy reserves.

Article 13 (Protection of Property): This article guarantees the protection of all forms of ownership, including the right to own and use natural resources. This is important for the security of investments in the energy sector.

Article 39 (Environmental Protection): This article mandates that the state take measures to protect the environment and ensure ecological safety. This is relevant to the energy sector, as energy production, distribution and consumption can have significant environmental impacts.

Article 94 (State Budget): This article stipulates that the state budget is funded by taxes and other revenues, which could include revenues from the energy sector.

While the Constitution doesn't directly address energy, these provisions create a legal framework for the management and utilization of energy resources in Azerbaijan.

3.2. National Environmental Legislation

GoA has committed itself to aligning the national environmental legislation with the principles of internationally accepted regulations, particularly with environmental regulations of EU. As this process is on-going, the Project must comply with the intent of current national legal requirements. Framework for the Azerbaijan national environmental legislation is formed by the Law on Protection of the Environment (1999), which addresses the following issues:

- Rights and responsibilities of the State, citizens, public associations and local authorities;
- Use of natural resources;
- Monitoring, standardisation and certification;
- Economic regulation of environmental protection;
- State Environmental Expertise (SEE);
- Ecological requirements for economic activities;
- Education, scientific research, statistics and information;
- Environmental emergencies and zones of disasters;
- Control over the environmental protection;
- Environmental audit;
- Responsibility for the violation of environmental legislation; and
- International cooperation.

According to Article 54.2 of the Law on Protection of the Environment, EIAs are subject to State Environmental Expertise (SEE), which means that the environmental authority Ministry of Environment and Natural Resources (MENR) is responsible for the review and approval of EIA reports submitted by developers. The Law establishes a basis for the SEE procedure, which can be seen as a "standalone" check of compliance of the proposed project with relevant environmental standards (e.g. permittable levels of pollution, discharges and noise). In addition, the law determines that projects cannot be implemented without a positive SEE resolution. SEE approach requires state authorities to formally verify all submitted projects in terms of their potential environmental impacts. Current internationally recognised practice emphasises a proportionate, consultative and publicly accountable approach to the impact assessment process.

On June 12, 2018, the *Law of Azerbaijan Republic "On Environmental Impact Assessment"* was passed by the Decree # 1175-VQ, establishing legal frameworks and procedures for the ESIA process in Azerbaijan.
Table 3.1 below provides a summary of the key national environmental and social regulations.

Table 3.1. Key national environmental and social regulations

Subject	Title	Date	Description / Relevance to the Project
General	Law of Azerbaijan Republic on Protection of the Environment No. 678-IQ.	08/06/1999 (last amendment 30/09/2014)	This Law governs the legal, economic and social framework for environmental protection. The purpose of this Law is to guarantee environmental safety and the ecological balance of the environment, prevent the impact of socioeconomic and other activities, preserve biological diversity, and effectively manage the use of nature. This Law governs mutual relations between society and nature for the purpose of improving the quality of the environment, using and renewing natural resources efficiently, and enforcing environmental protection laws and legal procedures.
	Law of Azerbaijan Republic on Environmental Impact Assessment No. 1175-VQ	12/06/2018	Establishes main principles and procedures for the environmental and social impact assessment, its' development and approval at the level of the state.
	Law of Azerbaijan Republic on Ecological Safety No. 677-IQ.	08/06/1999 (last amendment 01/02/2013)	One of two keystone laws of the country's environmental legislation (along with the *Law on the Protection of the Environment*). Its purpose is to establish a legal basis for the protection of life and health, society, the environment, including atmospheric air, space, water bodies, mineral resources, natural landscapes, plants and animals from natural and anthropogenic dangers. The Law assigns the rights and responsibilities of the State, citizens and public associations in ecological safety, including information and liability. The Law also deals with the regulation of economic activity, territorial zoning and the alleviation of the consequences of environmental disasters.
Biodiversity / ecosystems	Law of the Azerbaijan Republic on Specially Protected Natural Territories and Objects No. 840-IQ	24/03/2000 (last amendment 06/03/2015)	Determines the legal basis for protected natural areas and objects in Azerbaijan. Defines the animal world, property rights over fauna and legal relationships between parties. It also describes issues of State inventory and monitoring, and economic and punitive regulations.
	Law on Protected Areas, No. 540-IQ	2000 (last amendment in 2006)	This Law establishes legal basis for the organization, protection and management of protected areas, based on the following main objects: 1) conservation of biological diversity and ecosystem; 2) purposeful use of protected areas for scientific research, culture and education; 3) recreational use; 4) international cooperation (art. 3).
	Law of Azerbaijan Republic on Fauna No. 675-IQ.	04/06/1999 (last amendment 06/03/2015)	This Law establishes the legal basis for protection of fauna in the Azerbaijan Republic, with the aim of ensuring preservation and rational use of all types of wild animals. It also describes issues of State inventory and monitoring, and economic and punitive regulations
	Law of Azerbaijan Republic on Green Belts, No. 957-IVQ	2014	This Law aims at conservation of greens (trees, shrubs, flowers, grasses and planting materials) and green areas, also by defining the rights and obligations of state agencies, municipalities, legal entities and individuals.

Subject	Title	Date	Description / Relevance to the Project
Water	Water Code of Azerbaijan Republic (approved by Law No. 418-IQ).	26/12/1997 (last Amendment 06/03/2015)	Regulates the use of water bodies, sets property rights and covers issues of inventory and monitoring. The Code regulates the use of water bodies for drinking and service water and for medical treatment, spas, recreation and sports, agricultural needs, industrial needs and hydro energy, transport, fishing and hunting, discharge of waste water, fire protection and specially protected water bodies. It provides for zoning, maximum allowable concentrations of harmful substances and basic rules of industry conduct.
	Rules of Referral of Specially Protected Water Objects to Individual Categories, Cabinet of Ministers Decree No. 77.	01/05/2000 (last amendment 10/05/2012)	This resolution requires special permits for disposal if there are no other options for wastewater discharge. The resolution allows for restrictions to be placed on the use of specially protected water bodies, and for further development of regulations related to these water bodies. It requires consent from MENR for activities that modify the natural conditions of specially protected water bodies and includes provisions for permitting of any discharges to water that cannot be avoided. There are also special requirements for the protection of water bodies designated for recreational or sports use.
	Rules for Protection of Surface Waters from Waste Water Pollution, State Committee of Ecology Decree No. 1.	04/01/1994	Under this legislation the *Permitted Norms of Harmful Impact Upon Water Bodies of Importance to Fisheries* require discharges to meet several specified standards for designated water bodies in terms of suspended solids; floating matter; colour, smell and taste; temperature; dissolved oxygen; pH; Biological Oxygen Demand (BOD) and poisonous substances. Limits are based on Soviet era standards and are to be achieved at the boundary of the facility (specific "sanitary protection zone limits") rather than "end-of-pipe" limits. End of pipe limits are defined in facility-specific "eco-passports" and are established with the intent to ensure compliance with applicable ambient standards.
	ISR (Interstate Construction Regulations) 3.04-101-2005. Determination of basic calculated hydrological characteristics	15./12.2005	Instead of SNiP 2.01.14-83. AR State Building and Architecture Committee 15.12. Entered into force on 01.01.2006 in the territory of AR with the decision of 13 of 2005
	GOST 2874-82 Drinking water.	1985	Drinking water. Hygienic requirements and quality control
	ISR (Interstate Construction Regulations) 2.1.5.1315-03. Maximum allowable concentrations (MACs) of chemical substances in water of water objects of domestic and drinking water and cultural and domestic water use.	2003	Maximum allowable concentrations (MACs) of chemicals in the water of water objects used for drinking and domestic-recreation purposes. 2003

Subject	Title	Date	Description / Relevance to the Project
Air	Law of Azerbaijan Republic on Air Protection No. 109-IIQ.	27/03/2001	Establishes the legal basis for the protection of air, thus implementing the constitutional right of the population to live in a healthy environment. It stipulates the rights and obligations of the authorities, legal and physical persons and non-governmental organisations (NGOs) in this respect, sets general requirements for air protection during economic activities, establishes norms for mitigating physical and chemical impacts to the atmosphere, establishes rules for the State inventory of harmful emissions and their sources and introduces general categories of breaches of the Law that will trigger punitive measures.
	Methodology to Define Hazard Categories and need to develop Projects' maximum permissible emissions.	04/09/1990	Under this methodology the maximum permissible concentrations of harmful substances and their hazard classes are provided. Limits are based on Soviet era standards.
	ISR (Interstate Constriction Regulations) 2.04-03-2005. Protection from noise	06/08/2008	Norms of vibration and noise pollution that adversely affect the environment and human health. Approved by the Decree of the President of the Republic of Azerbaijan No 796 of 08.06.2008
Waste	Law of Azerbaijan Republic on Industrial and Domestic Waste No. 514- IQ.	30/06/1998 (last amendment 12/06/2012)	Describes State policy in environmental protection from industrial and household waste including harmful gases, waste water and radioactive waste. It defines the rights and responsibilities of the State and other entities, sets requirements for the design and construction of waste-treatment installations, licensing of waste generating activities, and for the storage and transport of waste (including transboundary transportation). The Law also encourages the introduction of technologies for the minimisation of waste generation by industrial enterprises. There is a general description of responses to infringements. This law is specified by Resolutions of the Cabinet of Ministers on the rules of certification of hazardous wastes, state strategy on management of hazardous wastes in Azerbaijan and by Instructions on the Inventory. Rules and Classification System of the Wastes generated by Industrial Processes and in the Field of Services approved by the MENR.
	SanPiN 2.01.28-85.	28.01.1985	Landfills for neutralization and disposal of toxic industrial waste. Basic provisions for design.
	Toxic industrial waste disposal and landfills for disposal. Design norms	01.01.2013	Approved by State Committee for Urban Planning and Architecture of the Republic of Azerbaijan 2013
	SanPiN № 4631-88.		Sanitary rules and norms for protection of coastal waters of the seas against pollution in places of water use of the population. Moscow – 1988
	GOST 2761-84. Interstate standard.		Sources of centralized economic-drinking water supply. Sanitary and technical requirements and rules of selection. МКС 13.060

Subject	Title	Date	Description / Relevance to the Project
Energy	Law on Energy Resources Utilization, No. 94-IQ	1996	The Law on Energy Resources Utilisation defines the legal, economic and social fundamentals for State policy on the use of energy resources as well as the main directions for policy implementation. The Law includes provisions on the certification and standardisation of energy consuming installations, facilities, etc..
	Law on Energy, No. 541-IQ	1998	This law covers the regulation of the exploration, exploitation, production, processing, storage, transportation, distribution and use of all energy materials and products, including gas.
	Law on Power Engineering, No. 858-VIQ	2023	The Law on Power Engineering provides the legal background for the generation, transmission, distribution and sale of electricity and heating, aiming at ensuring rational utilisation of power resources as well as environmental protection. The Law appoints the Ministry of Energy as the authority responsible for licensing and regulating electricity generation, transmission, distribution, sale, and import-export activities.
	Law on Heat and Electric Power Plants, No.784-IQ	2000 (last amended in 2019)	This Law determines the legal framework for the design, construction and operation of power plants including independent power plants. Any natural or legal entity has the right to construct, rehabilitate and operate power plants, and activities related to “industrial power plants” (i.e. excluding small power plants) must be licenced by the Ministry of Energy. The Law also provides for the process and conditions of negotiated access and connection of such licenced facilities to the grid
Subsoil	Law of the Azerbaijan Republic on Subsoil No. 439-IQ.	13/02/1998 (last amendment 25/12/2007)	Regulates the exploitation, rational use, safety and protection of subsurface resources. The Law lays down the principal property rights and responsibilities of users. It puts certain restrictions on the use of mineral resources, based on environmental protection considerations, public health and economic interests.
Information	Law of the Azerbaijan Republic on Access to Environmental Information No. 270-IIQ.	12/03/2002 (last amendment 20/10/2006)	Establishes the classification of environmental information. If information is not explicitly classified “for restricted use” then it is available to the public. Procedures for the application of restrictions are described. Law aims to incorporate the provisions of the Aarhus Convention into Azerbaijani Law.
Health & Safety	Law of the Azerbaijan Republic on Sanitary-Epidemiological Services (authorised by Presidential Decree No. 371).	10/11/1992 (last amendment 30/09/2014)	Establishes sanitary and epidemiological requirements for industrial entities to be met at design, construction and operational stages, and for other economic activities. Aims to protect the health of the population. It addresses the rights of citizens to live in a safe environment and to receive full and free information on sanitary-epidemic conditions, the environment and public health.
	Law of the Azerbaijan Republic on Protection of Public Health No. 360-IQ.	26/06/1997 (last amendment 02/02/2015)	Sets out the basic principles of public health protection and the health care system. The Law assigns liability for harmful impact on public health, stipulating that damage to health that results from a polluted environment shall be compensated by the entity or person that caused the damage.

Subject	Title	Date	Description / Relevance to the Project
	Law of the Azerbaijan Republic on Public Radiation Safety No. 423-IQ.	30/12/1997 (last amendment 03/03/2006)	Includes requirements for ensuring radiation safety in industrial entities. The Law establishes the main principles of government policy on radiation safety, as well as environmental norms protecting the safety of employees and populations in areas potentially affected by the use of radKOActive sources. The Law provides for compensation for damage to health, property and life due to accidents.
	Law of the Azerbaijan Republic on Technical Safety - 733-IQ	02/11/1999 (last amendment 30/09/2014)	The current law sets legislative, economic and social basis of PDF (Potential Dangerous Facilities) exploitation.
Employment	Labour Code of the Azerbaijan Republic No. 618-IQ	February 1, 1999,	The Labour Code, through the relevant legal norms, defines the labour, social, economic rights of employees and employers, as well as the principles and rules for ensuring the right to work, rest, work in safe and healthy conditions, as well as other fundamental rights and freedoms of citizens of the republic.
	Law on employment, No.1196-VQ	2018 (last amendment in 2019)	This Law establishes the legal, economic and organizational foundations of state policy in the field of employment assistance, as well as social protection of unemployed citizens.
	Law on unemployment insurance, No. 765- VQ	2017 (last amendment in 2018)	This Law establishes the basic principles of relations in the labour market of Azerbaijan, the creation of new mechanisms for financing the lost wages of insured citizens, payment of compensations to them and strengthening social protection of the population.
	Law on State Guarantees of Equal Rights for Women and Men.	10 October 2006	The law aims to eliminate all forms of gender-based discrimination and ensure gender equality in the political, economic, social and cultural spheres. All human rights are guaranteed to women and men.
Land management and acquisition	The Civil Code	Adopted in 1999	Articles 246, 247, 248 and 249 include provisions for acquisition of lands for state needs. The Code requires the Decree on acquisition of lands for state needs should be registered in state real estate registration. It also states that Executive Agency should; a) send official notifications to all affected persons about land acquisition; b) pay full compensation to the affected persons within 90 days after the transaction agreement made; c) assist relocated people; and d) pay compensation for affected assets on the market rates (in case it is not possible to identify market rates, replacement prices are used). The Civil Code states as well that affected person can select one or more type of compensations. It also states that any rights to real estate must be registered with the State, and that land may be acquired from owners for state needs as approved by the relevant courts. It also states that the legality of ownership is established through the registration certificate issued by the Real Estate Land Registry Service based on the cadastral information (survey numbers) obtained from the State Land and Cartography Committee (SLCC) where the land is located.
	The Land Code dated June 25, No. 695-IQ	1999 (last amendment in 2019)	The Land Code is aimed at regulating land relations, fulfilling the obligations of landowners, users and tenant farmers and protecting their rights to land, creating conditions for the rational use of lands and their protection, restoration and improvement of land fertility.

Subject	Title	Date	Description / Relevance to the Project
			Article 101 states that, all damages caused by acquisition of land (compulsory purchase) or temporary detention, as well as limiting the rights of owners, users and lessees or deterioration of the quality of soil should be fully paid to landowners or users. In addition, costs derived from early termination of its obligations against third parties should also be paid to the affected person. Disputes relating to compensation, is being considered in a court in accordance with the procedure established by the legislation.
	The Land Acquisition Law	April 2010	Specifically address matters related to involuntary resettlement (IR), including the process and institutional arrangement for land acquisition, compensation and valuation, consultation requirements, entitlements of various categories of displaced persons and grievance mechanism. The law considers various categories of displaced persons, including those without state registration, renters, non-formal long-term users of land, and persons who have no legal rights on the land that they live in. The law entitles persons who have no legal rights on the land to resettlement assistance and compensation for their non-land assets. It includes provision of compensation for loss of business/income, transition allowance and transportation support, and compensation for loss assets based on replacement cost. As per the LAL, in case of physical displacement, the acquiring authority needs to send notification to DPs at least 60 days before resettlement.
	Law on Acquisition of Lands for State Needs	2011	The Decree stipulates additional provisions for the implementation of the Land Acquisition Law. It also assigns government agencies for each case of relevant executive body.
	Law on the state land cadastre, land monitoring and land management No.593	22.12.1998. Last amended on 31.05.2018	This Law defines the legal framework for ordering the state land cadastre, land monitoring and land management works in the Azerbaijan Republic.
	Law on land lease dated December 11, No.587-IQ	Last amended on 31.05.2018	This law defines the legal framework for the lease of lands in state, municipal and private ownership, and lease relations in the Azerbaijan Republic. The law states that (Article 16) when the leased land is acquired for state needs, another land plot having a same size and a same quality can be provided to lessee. Losses incurred in this land shall be paid in accordance with the legislation.
	Law on the management of municipal lands No.160-IIQ	29.06.2001. Last amended on 19.06.2020	This Law regulates the general rules for the transfer of municipal lands to ownership, use and lease, taking into account the peculiarities of their management, legal relations in the field of their use and protection.
	Law on land market, No.665-IQ	1999 (last amendment in 2018, No.1287-VQD)	This Law establishes general rules for land market relations in the Azerbaijan Republic and ensures the protection of property rights to land.
	Cabinet of Minsters' Resolution	2012	Approving of guidelines for preparation of Resettlement Plan and Resettlement Guideline.

Subject	Title	Date	Description / Relevance to the Project
	No.45 24		
	Rules for assigning lands to categories and transferring them from one category to another", approved by Decision No. 10 of the Cabinet of Ministers	2017	Agricultural lands (arable lands) are specially protected and their transfer to other categories for non-agricultural purposes is permitted in exceptional cases in accordance with the Land Code of the Republic of Azerbaijan and on the basis of the requirements of the "Rules for assigning lands to categories and transferring them from one category to another".
Liability	Law on Mandatory Insurances.	24/06/2011	Identifies requirements for the mandatory insurance of civil liability for damage caused to life, health, property and the environment resulting from accidental environmental pollution.
Permitting	A System of Standards for the Environment Protection and Improvement of Natural Resources Utilisation. Industrial Enterprise Ecological Certificate Fundamental Regulations, GOST 17.0.0.04-90.	01/07/1990	The MENR issues ecological documents on the impact on the environment of potentially polluting enterprises. The documents include maximum allowable emissions, maximum allowable discharges, and an “ecological passport.” The last item is specific to countries of the Former Soviet Union and contains a broad profile of an enterprise’s environmental impacts, including resource consumption, waste management, recycling, and the effectiveness of pollution treatment. Enterprises develop the draft passport themselves and submit it to MENR for approval.
Cultural heritage	Law of the Azerbaijan Republic on the Protection of Historical and Cultural Monuments.	10/04/1998	Specifies the responsibilities of state and local authorities, and lays down principles for the use, study, conservation, restoration, reconstruction, renovation and safety of monuments. The Law declares that cultural objects with national status, historical and cultural monuments, cultural goods stored in state museums, archives, libraries, as well as the territories where they are situated, are not subject to privatisation. Requires archaeological studies prior to construction works in areas with archaeological significance.

3.3. National Energy Regulations

Azerbaijan has dedicated, comprehensive laws governing the various aspects of renewable energy development. The existing legal and regulatory framework for energy also considers specific provisions for the use of renewable energy, such as the following secondary laws aimed at promoting the use of renewable energy through special concessions.

Relevant laws and normative legal acts have been adopted in order to develop the renewable energy sector in the country, to improve the legislative and institutional environment in this area. In recent years, the work carried out in the field has been continued and the law of the Republic of Azerbaijan No 339-VIQ, dated 31 May 2021 On the use of renewable energy sources in the production of electricity, which makes a special contribution to the development of renewable energy has been approved.

The State Program on the Use of Alternative and Renewable Energy Sources, adopted in 2004, aims to determine the potential of alternative energy sources in the production of electricity, increase the efficiency of national energy sources, guarantee national energy security, decrease CO2 emissions, and support job creation via renewable energy sector development.

The amendments of March 2014 to the two Cabinet of Ministers Decrees on Rates of custom duties for export–import operations in Azerbaijan Republic and List of goods exempted of VAT imported to Azerbaijan Republic territory state that the import of equipment, facilities, parts and tools used in the renewable energy industry and in achieving energy efficiency are exempt from customs duties and VAT.
The Decree of the Cabinet of Ministers On determination of electricity production and power limits for the commissioning of electrical installations (No. 482/2016) states that special permits for alternative and renewable energy power plants are required only for power plants with a capacity of more than 150 kW, and for hydropower plants and biogas power plants with a capacity of more than 500 kW.

As shown in the Figure 3.1 below, the permitting procedure for renewable energy in Azerbaijan is complex, as involving fragmented division of responsibilities across Ministries and local administration.

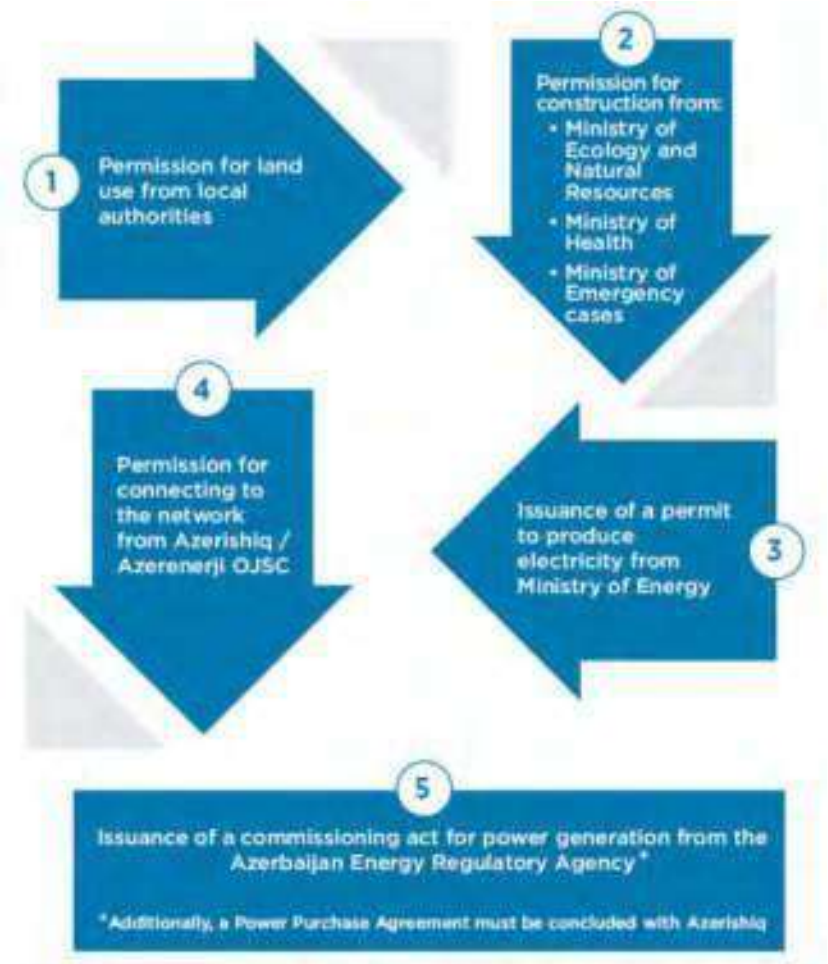


Figure 3.1: Overview of Existing Renewable Energy Permitting Procedures (IRENA, 2019)

3.4. National ESIA Legislation

Regulatory requirements on the EIA process in Azerbaijan are set by the Law on Environmental Impact assessment. The purpose of the Law on EIA is to enact Article 54.2 of the Law "On Environmental Protection" by defining the legal, economic and organizational bases of the process of assessing the environmental and health impacts of economic activities implemented by private and public sector entities. Fundamental principles established by the law say that the EIA process shall:

- be based on the analysis of environmental, social and economic impacts of the planned activity;
- ensure the accuracy, transparency and reliability of the activity's environmental security related information;
- take into account the need to maintain the ecological balance and protect the biodiversity;
- accurately identify all possible environmental impacts and assess the levels of risks;
- ascertain that effects of the impacts will stay within the restrictions set by the respective standards.

- Ensure that, in addition to consultations with government and municipal authorities, the EIA process and findings are disclosed to, consulted with and reviewed by a wider list of stakeholders, including individuals, firms and NGOs;
- Ensure that the EIA is open for the state control transparent for the general public.

Requirements as to the EIA procedures are described in Article 4 of the Law. According to this Law, in order to coordinate the planned activity with the State Ecological Expertise of the MENR, it is necessary to develop and submit the EIA report to the representatives of MENR. The purpose of the Law "On EIA" is to create the legal basis for the functioning of the mechanism for the environmental impact assessment of public and private projects or the types of planned activities to ensure the prevention or reduction of negative impacts on the environment and public health at the earliest stages. The development of the EIA report is mandatory.

In accordance with the provisions of this Law, the EIA is carried out based on the following principles: an integrated environmental, social and economic assessment of the impact of the proposed activity on the environment and human health; ensuring the integrity, transparency and reliability of information about the environmental safety of the proposed activity; the preservation of ecological balance and biodiversity; not to exceed the impacts of the proposed activity on the environment to acceptable standards; forecasting of possible environmental consequences and assessment of the level of environmental risks; ensuring transparency in the EIA, informing the public and taking into account public opinion.

Specifically, the EIA report should include:

- Assessment of the initial and expected state of the environmental and socio- economic environment.
- Determination of the environmental impacts of construction, reconstruction and operation of facilities.
- Environmental Management Plan, combining a system of measures to reduce and mitigate environmental impacts.
- Environmental Monitoring Plan providing for the effectiveness of environmental measures.
- Summary of the EIA process, including mandatory requirements, is presented in Table 3.2 below.

Table 3.2. Summary of the active EIA requirements in Azerbaijan

EIA coverage and requirements	
Activities that require EIA	Activity types for which EIA is required are listed in the Annex to the EIA Law. Among others, the list includes exploration and development of mineral resources.
EIA Scoping	A party responsible for the assessment is required to carry out the EIA on the proposed activity after initial consultation with the relevant competent authority (MENR). Preliminary consultations are required to pre-determine the contents, scope and methods of the assessment, and to ensure the completeness and accuracy of the information to be reflected in the EIA document.
EIA Report	

General	In accordance with the Law "On Environmental Protection", the EIA report must be prepared at the project development stage and submitted to the relevant competent authority. The report should be prepared in an easy-to-understand style, characterize environmental baseline of the area where the proposed activity will take place, identify possible potential environmental and health related impacts of the activity, determine ways to eliminate these impacts, and suggest recommendations for minimizing adverse effects.
Project description	Description, purpose, stages, types of environmental impacts and environmental risk assessment methods of the proposed activity should be provided.
Project alternatives	At least two alternatives to the proposed activity (including the zero activity option), as well as an environmental justification for the most effective technological solutions, must be provided.
Regulatory requirements	Regulatory framework referred to during the preparation of the EIA document and a summary of the legal acts should be included.
Environmental and socioeconomic baseline	Environmental and socioeconomic baseline of the area must be studied and described.
Impacts and mitigation measures	All impacts (direct and indirect, localized and broader scale, acute and chronic, one-time and cumulative, emergency and irregular, temporary and permanent) should be identified and assessed according to their magnitude and severity, and measures should be proposed to prevent, reduce and mitigate these impacts.
Transboundary and emergency impacts	In case cross-border impacts are identified, they should be assessed in accordance with procedures and conditions established (not yet adopted) by the relevant authority (Cabinet of Ministers). Emergency impacts should also be addressed in the ESIA report.
Environmental management and monitoring	General information on the environmental management plan adopted for all phases of the project, including relevant management and monitoring plans, should be included.
Residual impacts	A summary of the residual effects and their significance should be included.
EIA Disclosure	
Public participation	The law requires that the public affected by the planned activities be informed on the EIA process. The Client is expected to engage the affected community in discussions regarding the proposed activities.
State environmental expertise	The Law on Environmental Protection requires that the EIA report is reviewed by MENR (within 3 months) and the MENR prepares an expert opinion. The opinion must be published and submitted to the

	relevant executive authorities in the area where the proposed activities will be carried out.

State approval of the EIA by the MENR creates a compliance mechanism, including environmental and social standards that the organization must comply with. The law requires that an EIA document be prepared by at least three EIA assessors – qualified and certified specialists included in the expert list of MENR. As of the time the current ESIA was prepared, there weren't any acts regulating certification and registration procedures in Azerbaijan.

3.5. Regulatory Agencies

The ministries, agencies and institutions having key functions with responsibility for the environmental and social aspects of the Project are listed in the Tables 3.3 and 3.4 below.

Table 3.3. Overview of Relevant Institutions at Government Level

Entity	Functions
Ministry of Ecology and Natural Resources (MENR)	Representing the central state authority overseeing the environmental protection. The Decree No.485/2001 sets forth provisions on duties and authorities, activities and organization of the MENR, which is seen as the executive central body in carrying out activities in the field of environment such as ensuring environmental protection, developing efficient use of natural resources, groundwater and mineral resources, observing hydrometeorology processes, improving soil fertility, to this end monitoring, surveying and mapping.
Ministry of Energy	Responsible for regulation of activities in the mining and energy industries of the Republic of Azerbaijan, covering the functions of both the abolished Ministry of Industry and Energy and Ministry of Fuel and Energy. The Ministry is responsible for the design and implementation of state policy and regulation in the energy sector, mainly concerning natural gas production, transportation, processing, distribution and supply; electricity generation, transmission, distribution and supply; and energy saving and efficiency. Moreover, the Ministry controls relevant state-owned enterprises. The Ministry has a dedicated department that is responsible for increasing the deployment of energy efficiency and renewable energy policies.
Ministry of Emergency Situations (MES)	It is a central executive body responsible for the civil defense and the protection of the population from natural and man-made disasters.
Ministry of Health	It is the state institution controlling the sanitary-epidemiological situation in the country and regulation of health protection in the

Entity	Functions
	workplace. To be involved to issue permit to construct. It has a role during the permit process.
Tariff (price) Council	This is the implementing body for energy prices, service fees and collections across all regulated entities in the economy. The Council is chaired by the Ministry of Economic Development and has 12 members.
Azerbaijan Renewable Energy Agency (AREA)	Agency driving the development of the country's renewable energy resources and related projects, by preparing state policy, legal acts, regulatory documents and implementing state policy for creation and development of renewable energy sources. The status of the Agency was altered by a Presidential Decree No. 464 of 14 January 2019.
Azerbaijan Energy Regulatory Agency (AERA)	This recently established Agency (December 2017) is the Public Legal Entity under the Ministry of Energy in charge of bringing utility services in line with the requirements of the market economy; achieving sustainable development by further improving control mechanisms; maintaining transparency and flexibility in energy supply; and ensuring accessibility of these services for entrepreneurs.
Ministry of Labour and Social Protection of Population	Government structure contributing to high-levelled execution of social policy strengthening and improvement of welfare state of country population.
State Tourism Agency of the Republic of Azerbaijan	The agency is the central executive body implementing the state policy and regulation in the field of protection of historical and cultural monuments located in the territories of the state reserves under its subordination. The State service is the executive body exercising state control on usage of immovable historical and cultural monuments (except State Historical-Architecture of "Icheri Sheher" and "Qala" State Historical Ethnographic Reserve) that are under state protection, restoration, reconstruction and protection.
Ministry of Culture (State Service for Protection, Development and Restoration of Cultural Heritage under the Ministry of the Culture of the Republic of Azerbaijan)	Governmental agency within the Cabinet of Azerbaijan in charge of regulation of the activities and promotion of Azerbaijani culture.
The State Land and Cartography Committee of Azerbaijan Republic (SLCC)	In charge of implementing land cadastral, monitoring and reforms; restoration and increasing of land productivity, setting territorial units in Azerbaijan Republic. The Department on Land structure, land reform and Work with regions under SLCC is responsible for coordination of Land acquisition and resettlement works with executive agencies.

Entity	Functions
Ministry of Science and Education, Institute of Geology and Geophysics	The Institute of Geology and Geophysics (IGG) of the Azerbaijan National Academy of Sciences has a broad mission encompassing fundamental and applied research, scientific expertise, education and training.
Azerbaijan National Academy of Sciences, Institute of Archaeology and Ethnography	The Institute of Archaeology and Ethnography of the Azerbaijan National Academy of Sciences (ANAS) has a multifaceted mission that centers around research and preservation of historical and archaeological heritage.
Azerbaijan National Academy of Sciences, Institute of Zoology	This institute focuses on research in zoology, with particular emphasis on the fauna of Azerbaijan. Their work covers various aspects of animal life, including biodiversity, ecology, evolution, and conservation.
Azerbaijan National Academy of Sciences, Institute of Botany	The institute is dedicated to the study of plant life in Azerbaijan. Their research encompasses the diversity, distribution, ecology, and conservation of the country's flora, as well as the exploration of plant resources and their potential applications.
District / city level Executive Authorities	They are representative offices of the President of Azerbaijan in places. Within the limits of their authority, they manage a city (region), adopt acts of regulatory and normative nature, dispose of state-owned lands, develop and implement programs for socio-economic development in the territories entrusted. The Executive Authorities are responsible for the local management of state lands within the Districts territories, and for the supervision of municipal land management.
Municipalities	They are a form of local self-government and non-state system for organizing the activities of citizens within the territories established by the laws of Azerbaijan. Municipalities, within their powers, design and implement programs for social protection and social development, economic development and local environmental programs.

Table 3.4. Overview of Relevant State Energy Entities

Entity	Main Functions
AzerEnerji JSC - Electricity generation and transmission	Electricity generation and transmission. Discussion with the Company ongoing defining Project's details and implementation.
Azerishiq JSC - Electricity distribution and supply	Electricity distribution and supply.
State Energy Agency of the Nakhchivan Autonomous Republic	Electricity generation, transmission, supply and distribution in the territory of the Nakhchivan Autonomous Republic of Azerbaijan (regional energy exchanging with Turkiye and Iran).
Azalternativenergy LLC	Under the structure of the State Agency on Alternative and Renewable Energy Sources, this 100%-state-owned company was established to implement renewable energy projects; generate, transmit and distribute electricity from alternative and renewable energy; and provide

	construction and engineering services to both the government and the private sector.

3.6. HSE Norms and Standards

Information on this section of the regulatory framework is presented in Annex 11, so as to streamline the main section of the report.

3.7. International Conventions, Protocols and Agreements

Table 3.5 below presents the list of the main international and regional conventions which Azerbaijan has ratified over years and are relevant to the Project. Many of the international ones are incorporated into the EPs, IFC PSs, EBRD PRs, ADB Safeguard Policy and associated guidance.

Table 3.5. International and regional conventions

Name of convention	Year of Ratification
International Labour Organization (Fundamental)	
C029 - Forced Labour Convention, 1930	1992
C087 - Freedom of Association and Protection of the Right to Organise Convention, 1948	1992
C098 - Right to Organise and Collective Bargaining Convention, 1949	1992
C100 - Equal Remuneration Convention, 1951	1992
C105 - Abolition of Forced Labour Convention, 1957	2000
C111 - Discrimination (Employment and Occupation) Convention, 1958	1992
C138 - Minimum Age Convention, 1973. Minimum age specified: 16 years	1992
C182 - Worst Forms of Child Labour Convention, 1999	2004
Pollution prevention	
Stockholm Convention on Persistent Organic Pollutants	Acceded in 2004
Convention on the Transboundary Effects of Industrial Accidents*	Acceded in 2004
Basel Convention on the Control of Transboundary Shipment of Hazardous Wastes	2001
Kyoto Protocol, 1997	Acceded in 2000
UN Convention on the Protection of the Ozone Layer (Vienna Convention)	Acceded in 1996
Montreal Protocol on Substances that Deplete the Ozone Layer, 1987	Acceded in 1996
United Nations Framework Convention on Climate Change, 1992	Acceded in 1992
UNECE Geneva Convention on Long-Distance Transboundary Air Pollution*	2002
UN Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposals	2001
International Carriage of Dangerous Goods by Road*	2000

Name of convention	Year of Ratification
Espoo Convention* (To promote environmentally sound and sustainable development through the application of ESIA, especially as a preventive measure against transboundary environmental degradation)	Acceded in 1999
Aarhus Convention* (To guarantee the rights of access to information, public participation in decision-making and access to justice in environmental matters)	Acceded in 2000
Biodiversity Protection	
UNESCO Convention on Wetlands of International Importance especially as Waterfowl Habitat / RAMSAR Convention	2001
UN Convention on Biological Diversity, 1992	2000
Bern Convention on conservation of wild flora and fauna and their natural habitats	In force since 2002
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1999
Cultural Heritage	
Convention for the Safeguarding of the Intangible Cultural Heritage. Paris 2003	2007
Convention concerning the Protection of the World Cultural and Natural Heritage. Paris, 16 November 1972.	1993
European Convention on the Protection of the Archaeological Heritage	2000
Human Rights	
European Convention for the Protection of Human Rights and Fundamental Freedoms	2002
UN Convention on the Elimination of All Forms of Discrimination against Women	1995
UN Convention against Torture and Other Cruel, Inhuman or degrading treatment or punishment	1996
UN International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families	1999
UN International Covenant on Economic, Social and Cultural Rights	1992
UN Convention on the Rights of the Child / Protocol Faculty in connection with the participation of children in armed conflicts	1992/2002
UN Convention on the Elimination of All Forms of Racial Discrimination	1996
Regional Framework Convention for the Protection of National Minorities	2000
UN Convention on the Rights of Persons with Disabilities	2009
UN International Covenant on Civil and Political Rights	1992
The high-level conference on the future of the European Court of Human Rights. Interlaken Declaration	2010
The high-level conference on the future of the European Court of Human Rights. Izmir Declaration	2011
The high-level conference on the future of the European Court of Human Rights. Brighton Declaration	2012

Name of convention	Year of Ratification
*UNECE agreement; Azerbaijan became a member of the UNECE in 1993. The major aim of the UNECE is to promote pan-European integration through the establishment of norms, standards and conventions.	

3.8. International Environmental and Social Performance Standards and Guidelines

World Bank requires the projects that it finance to meet the Bank's Environmental and Social Standards. Beyond Azerbaijan's legal requirements, the World Bank requirements are detailed in the following documents:

1. WB Environmental and Social Framework (ESF)
2. IFC Performance Standards on Social and Environmental Sustainability, 2012.
3. World Bank Group Environmental, Health and Safety General Guidelines, 2007.
4. World Bank Group Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution, 2007.

3.8.1. Equator Principles

The Equator Principles were initially developed in June 2003 by a group of leading financial institutions to provide an approach to determine, assess and manage environmental and social risk in project financing. By August 2012, over 77 financial institutions were signatories to the Equator Principles (thus referred to as Equator Principle Financial Institutions, EPFIs) to ensure that the projects that were financed were developed in a manner that is socially responsible and reflect sound environmental management practices.

The Principles apply to all new project financings globally with total project capital costs of US$10 million or more. The ten Equator Principles as adopted in July 2006 are:

- **Principle 1** – Review and Categorization: Obliges the categorization of projects based on the magnitude of potential impacts and risks in accordance with the social and environmental screening criteria of the IFC.
- **Principle 2** – Social and Environmental Assessment: Requires the evaluation of social and environmental impacts and risks and the identification of mitigation and management measures that are needed to reduce impacts to acceptable levels.
- **Principle 3** – Applicable Social and Environmental Standards: Establishes the IFC Performance Standards and Environmental, Health and Safety (EHS) Guidelines to complement the host country legislation as the basis for social and environmental performance.
- **Principle 4** – Action Plan and Management System: Requires the development of a plan for implementing the mitigation measures, corrective actions and monitoring measures necessary to manage the impacts and risks identified by the Assessment.
- **Principle 5** – Consultation and Disclosure: Obliges free, prior and informed consultation and the facilitation of informed participation for projects that may have significant adverse impacts to local

communities and the public disclosure of the Assessment and Action Plan in a culturally appropriate manner.

- **Principle 6** – Grievance Mechanism: Requires that an appropriate grievance process be included as part of the management system and that affected communities are informed of the process. Will be confirmed as part of the impact assessment process.

Principle 3 expressly cross references and incorporates the IFC's Performance Standards and the World Bank Group (WBG) Environmental, Health, and Safety (EHS) Guidelines, thus obliging projects seeking financing from EPFIs to apply IFC Performance Standards/ EHS Guidelines, including applicable WBG/IFC Industry-Specific EHS Guidelines.

The IFC has developed its own policies which apply specifically to IFC investments. These include i) the Policy on Disclosure of Information which defines IFC's obligations to disclose information about itself and its activities; and ii) the Policy on Social and Environmental Sustainability which defines IFC's role and responsibility in supporting project performance in partnership with project sponsors.

At the project level, which applies to both IFC and EPFI investments, the Performance Standards, Guidance Notes, EHS Guidelines, and best practice materials are applicable.

On 13 August 2012, the Equator Principles (EP) Association released the draft of the updated Equator Principles (EP III) for stakeholder consultation and public comment. Key themes and areas of development proposed in the EP III draft include:

- an extension in the scope of the EP to Project-Related Corporate Loans and Bridge Loans;
- changes reflecting the recent update of the International Finance Corporation (IFC) Performance Standards;
- new requirements related to managing impacts on climate;
- greater emphasis on human rights considerations in due diligence and an acknowledgment of the UN "Protect, Respect and Remedy" Framework for Business and Human Rights and Guiding Principles on Business and Human Rights; and
- a strengthening of reporting and transparency requirements.

Categorisation of projects is based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. According to the IFC classifications, projects fall into one of three categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. The Category definitions are as follows:

- Category A – projects with the potential for significant adverse impacts, which are diverse, irreversible or unprecedented.
- Category B – projects with limited potential adverse impacts which are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures.
- Category C – projects which have minimal or no potential impacts.

3.8.2. WB ESF Environmental and Social Standards

Sub-projects to be supported by the World Bank through Investment Project Financing under AZURE and by the GoA are required to meet the following Environmental and Social Standards (ESSs). The WB also requires the associated facilities to meet the WB's E&S requirements through ESDD and corrective measures that will be applied to ESIA/ESMP to be developed for GoA funded project:

- **Environmental and Social Standard 1:** Assessment and Management of Environmental and Social Risks and Impacts - This establishes the importance of integrated assessment to identify the social and environmental impacts, risks, and opportunities in the project's area of influence. This standard requires that social and environmental assessment and management systems are in place for managing social and environmental performance throughout the project life cycle. Its main elements include: (i) social and environmental assessment; (ii) management program; (iii) organizational capacity; (iv) training; (v) stakeholder engagement; (vi) monitoring; and (vii) reporting.
- **Environmental and Social Standard 2**: Labour and Working Conditions - It requires that the worker-management relationship is established and maintained, compliance with national labour and employment laws and safe and healthy working conditions are ensured for the workers. This standard is very important as the project will employ workers to execute the project.
- **Environmental and Social Standard 3**: Resource Efficiency and Pollution Prevention and Management - This gives an approach to pollution prevention and abatement in line with Internationally accepted technologies and practices with objectives to a) avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from activities; and b) promote the reduction of emissions that contribute to climate change. Under this standard, a project is required to avoid, minimize, or reduce adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. This standard is relevant in that there is a possibility of pollution into the water resources as well as air quality.
- **Environmental and Social Standard 4**: Community Health and Safety – It outlines the responsibility to be undertaken by the client to avoid or minimize the risks and impacts to the community's health, safety and security that may arise from project activities. The project activities for the AZURE Project are likely to cause health and security risks if not managed properly.
- **Environmental and Social Standard 5**: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement - This standard requires that the project does not result in involuntary resettlement or at least, if unavoidable, it is minimized by exploring alternative project designs. It also requires that the project ensures that social and economic impacts from land acquisition or restrictions on affected persons' use of land are mitigated. The AZURE Project may involve the acquisition of land.
- **Environmental and Social Standard 6**: Biodiversity Conservation and Sustainable Management of Living Natural Resources – This standard aims to protect and conserve biodiversity, the variety of life in all its forms, including genera, species and ecosystem diversity and its ability to change and evolve, which is fundamental to sustainable development. The AZURE Project will evaluate the biodiversity features in compliance with ESS6, through consideration of Critical Habitat amongst others and will try to avoid or mitigate threats to biodiversity arising from project activities and where this cannot be avoided relevant mitigation measures will be in place in accordance with ESF risk mitigation hierarchy.

Seasonal onsite biodiversity studies are planned to address gaps, particularly for bird migration and species near protected areas, including wetlands that support bird populations. The study will include bird and bat collusion and bird electrocution risk assessment in addition to other relevant ESS6 assessments.

- **Environmental and Social Standard 7**: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities – This standard is not relevant as there are no indigenous peoples who meet the definition of this Standard in Azerbaijan.
- **Environmental and Social Standard 8**: Cultural Heritage - It aims to protect the irreplaceable cultural heritage and to guide project proponents on protecting cultural heritage in the course of project operations. In cases where the project finds items of cultural importance, notification procedures will have to be followed to ensure protection of cultural heritage of the area and the country.
- **Environmental and Social Standard 9**. Financial Intermediaries – This standard is not relevant as The Project does not support any financial intermediaries.
- **Environmental and Social Standard 10**: Stakeholder Engagement and Information Disclosure: This ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. The proposed AZURE project will require extensive stakeholder engagement because its success will depend on how it is received by the communities. In addition, its design will have to be informed by the involvement of the affected communities and other stakeholders.

In accordance with the WB's Environmental and Social Framework (ESF), the WB assesses the environmental and social risk of AZURE as **Substantial**, indicating that the potential adverse environmental and social risks and impacts are site-specific, largely reversible, and can be readily mitigated through standard management practices. This classification is due, in part, to the sensitive environments that may be affected, and the need for land acquisition and involuntary resettlement. The scoping process identified key risk areas including habitat disruption, air and water quality degradation, and impacts on local communities. These risks were assessed through preliminary site visits, stakeholder consultations, and baseline environmental and social data collection. Mitigation strategies will be developed in alignment with World Bank Environmental and Social Standards (ESS), particularly ESS1 (Assessment and Management of Environmental and Social Risks and Impacts) and ESS4 (Community Health and Safety), to ensure sustainable and responsible project implementation.

3.8.3. IFC Performance Standards and Guidelines[1]

The IFC Performance Standards on Social and Environmental Sustainability, previously published in April 2006 and updated in January 2012, are considered to be the most comprehensive standards available to international finance institutions working with the private sector.

The Performance Standards define a project's role and responsibilities for managing health, safety, environmental, and community issues to receive and retain IFC and/or Equator-participating lender support.

[1] IFC Performance Standards on Environmental and Social Sustainability. 2012

The IFC Performance Standards are supported by Guidance Notes giving further information on the requirements of the Performance Standards, and on good practice to enable improved project performance. IFCPerformanceStandards1 to 6 and 8 are all relevant to the Project. Where 'the client' is used, this refers to the owner/operator of the Project.

The Performance Standards are summarised below, followed by more detailed content definitions:

- **Performance Standard 1** – Assessment and Management of Environmental and Socials Risks and Impacts: This standard seeks to identify and assess the social and environmental impacts of the Project, including cumulative and/or sectoral impacts and technically and financially feasible alternatives, and to avoid, minimize, and manage any unavoidable adverse impacts to people, their communities, and their environment. It requires the development of a formal environmental and social policy reflecting the principles of the PS. It clarifies levels of stakeholder engagement under different circumstances and required engagement beyond affected communities. It promotes improved environmental and social performance through effective management systems and periodical performance review by senior management. Finally, it refers to private sector responsibility to respect human rights.
- **Performance Standard 2** – Labour and Working Conditions: This standard seeks to establish, maintain, and improve the working relationship between workers and management. It mandates equal opportunity and fair treatment of workers and protects against child and/or forced labour practices. It demands that the workplace offer safe and healthy working conditions that promote the health and welfare of the employees. It establishes requirements for comparable terms and conditions for migrant workers, compared to non-migrant workers, and introduces the quality requirements for workers' accommodation. Additionally, it requires on-going monitoring of primary supply chain and introduces "safety" trigger for same. Updates to the PS require the inclusion of monitoring construction contractors.
- **Performance Standard 3** – Resource Efficiency and Pollution: This standard is intended to minimize adverse impacts on human health and the environment by minimizing pollution and reducing emissions that contribute to climate change. It introduces a resource efficiency concept for energy; water (including unacceptable water stress), and core materials inputs. Requirements on energy efficiency and greenhouse gas measurement are important, similarly on the concept of "duty of care" for hazardous waste disposal. The 2007 EHS Guidelines give guidance for evaluating and selecting pollution prevention and control techniques for projects. These Guidelines contain the performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from the levels and measures presented in the EHS Guidelines, project proponents will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the proponent will provide full and detailed justification for any proposed alternatives. This justification will demonstrate that the choice for any alternate performance levels is consistent with the overall requirements of this PS. Updates to the PS have reduced the annual threshold for reporting GHG emissions down to 25,000 tonnes.

- **Performance Standard 4** – Community Health, Safety, and Security: This standard limits risks and impacts to the local communities associated with all phases of the Project, including unusual conditions. It requires that the health and safety risks be evaluated during all phases of the Project and that preventative measures be implemented to a level that is commensurate with the risk. It considers risks to communities associated with use, and/or alteration of natural resources and climate change through an ecosystem approach. It also gives consideration for the risks posed by security arrangements. Security arrangements must be guided by the principles of proportionality, good international practices in terms of hiring, rules of conduct, training, equipping and monitoring of such personnel, and applicable law. The use of force is typically not sanctioned and a grievance process must be established to allow affected communities to express concerns about the security arrangements and acts of security personnel. Updates to PS 4 have introduced requirements to consider construction workers accommodation.
- **Performance Standard 5** – Land Acquisition and Involuntary Resettlement: This standard seeks to avoid and minimize involuntary resettlement and to mitigate unavoidable adverse impacts through compensation for loss of economic assets an economic and standard of living restoration measures. Land use issues are key to sustainability and requirements regarding consultation are essential. Resettlement measures are intended to aim at improving economic and livelihood conditions. PS updates have changed the scope of application of PS 5 to include resource users e.g. fisheries, land users etc.
- **Performance Standard 6** – Biodiversity Conservation and Sustainable Management of Living Natural Resources: This standard calls for the balancing of conservation of biodiversity and the promotion of sustainable management of natural resources. It explains in details definition of and requirements for various types of habitat. It introduces clear requirements for biodiversity offsets, with updates in 2012 requiring projects to develop a net positive gain for critical habitats. The Project site is host to certain sensitive ecosystems or habitats that are important to fauna and flora species of international concern and the ESIA will fully consider ecosystems services.
- **Performance Standard 7** – Indigenous Peoples: This standard ensures that Project development respects the dignity, human rights, and cultures of indigenous peoples and avoids adverse impacts to their traditions and values. It seeks to establish and maintain on-going relationships and to foster good faith and informed participation of indigenous peoples when projects are located on traditional or customary lands and to respect and preserve those cultures and practices. It introduces the concept of Free, Prior, and informed Consent (FPIC) under certain circumstances. Based on the IFC definition of Indigenous Peoples, this Performance Standard is not applicable to the current Project.
- **Performance Standard 8** – Cultural Heritage: This standard protects cultural heritage sites from Project-related impacts and promotes the equitable sharing of benefits from the use of cultural heritage in business activities. It requires clients to allow access to cultural sites. Items of local cultural importance that will be affected by the Project include old tombs and artefacts in the lowlands. Changes to this PS in 2012 relate to access to information policy.

These Performance Standards, and all IFC reference documents, are included at http://www.ifc.org and are supported by Guidance Notes for each Performance Standard. The Table 3.6 below provides a brief summary of how each Performance standard shall applies to the potential ore exploration Project.

Table 3.6. A brief summary of how each Performance IFC standard applies to the Project

IFC Performance Standard	Brief summary of how each Performance Standard applies to the potential project
1 - Assessment and Management of Environmental and Socials Risks and Impacts:	• Social and environmental impact assessments must be undertaken and mitigation measures outlined to avoid, minimise, compensate/offset and manage adverse impacts. • On-going stakeholder engagement must be provided, including use of SEP. Involvement and communication with stakeholders throughout the project, including beyond the scope of directly affected communities. • Provision of guidance and recommendations towards ensuring on-going public and stakeholder participation in the Project. This includes recommendations referring to participatory monitoring programmes with relevant NGOs and community members. • Development of effective and integrated management systems. • Responsibility to respect human rights should be undertaken.
2 - Labour and Working Conditions:	• Establish and maintain high standards of relationships between workers and managers. • Fair treatment of employees, no child and/or forced labour. • Safe working conditions for all employees, including contractors. • Consideration and on-going monitoring of supply chain.
3 - Resource Efficiency and Pollution:	• Minimise adverse impacts on human health and the environment by reducing pollution. • GHG emissions must be calculated within the ESIA and require on-going monitoring.
4 - Community Health, Safety, and Security:	• Risks to communities and employees must be considered throughout all impact assessment process. Monitoring is required through all phases of the Project to ensure preventative measures are in place to reduce risks. • The ESIA must outline the necessity for on-going training to employees and the steps that need to be taken to support community health, safety and security. • Project impacts on ecosystem services must be addressed.
5 - Land Acquisition and Involuntary Resettlement:	• Once Project development requires resettlement and has a direct effect on livelihoods, all these measures must be taken into due consideration. • If a land rental is required, AzerEnerji must communicate promptly and clearly with local farmers and herders to ensure that Project activities, specifically the fencing-off of some land, will not alter livelihoods of local residents.

IFC Performance Standard	Brief summary of how each Performance Standard applies to the potential project
6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources:	• Project EBS must assess the area's biodiversity baseline and ecosystems services. • Project ESIA has to make clear recommendations relating to on-going considerations and actions recommended for minimising the future Project's impact on sensitive animal and plant species. Ongoing monitoring and review are highly recommended.
7 - Indigenous Peoples:	• Local society, research and assessment of the social situation in AoI settlements, the contribution of the project to the socio-economic situation of the local population.
8 - Cultural Heritage:	• Project ESIA have to include an archaeology and cultural heritage baseline and a cultural heritage impact assessment and have respective 'cultural heritage management plan'.

Documents relevant to various aspects of Project implementation include, but are not limited to, IFC and WB Group publications, itemised in Table 3.7 below.

Table 3.7. IFC and WB Group Guidance Publications Relevant to the Project

Title	Date
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	2018
ESS2: Labor and Working Conditions	2018
ESS3: Resource Efficiency and Pollution Prevention and Management	2018
ESS4: Community Health and Safety	2018
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	2018
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	2018
ESS8: Cultural Heritage	2018
ESS10: Stakeholder Engagement and Information Disclosure	2018
WB Good Practice Note for Energy Sector Adaptation	2019
Pollution Prevention and Abatement Handbook	1999
Assessing Private Sector Contributions to Job Creation: IFC Open Source Study	2012
IFC Investing in People: Sustaining Communities through Improved Business Practice	2001
Good Practice Note: HIV/AIDS in the Workplace	2002
Good Practice Note: Addressing Social Dimensions of Private Sector Projects	2003
Good Practice Note Number 4, Managing Retrenchment	2005
Good Practice Note: Non-Discrimination and Equal Opportunity	2006
A Guide to Biodiversity for the Private Sector, IFC	2006
Stakeholder Engagement: IFC guide on Good Practice Handbook for Companies Doing Business in Emerging Markets	2007
IFC Introduction to Health Impact Assessment	2009

Title	Date
Developing a Transparent System for Local Contracting, IFC	2008
Developing SMEs Through Business Linkages, IFC	2008
Projects and People: A Handbook for Addressing Project-Induced In-Migration, IFC Guide to Human Rights Impact Assessment and Management; IFC, Global Compact, International Business Leaders Forum	2009
Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	2012
Guidance Note 8: Cultural Heritage	2012
Stakeholder Engagement: A Good Practice Handbook for Companies doing Business in Emerging Markets	2007

The Environmental Health and Safety (EHS) Guidelines are technical reference documents designed to assist a wide range of users including project proponents, financiers, facility managers, and other decisionmakers by providing relevant industry background and technical information. This information supports actions aimed at avoiding, minimizing, and controlling environmental, health, and safety impacts during the construction, operation, and decommissioning phases of a project or facility.
The General EHS Guidelines are organized to capture common themes which are applicable to any industry sector and project. The General EHS Guidelines and the Industry Sector EHS Guidelines are designed to be used jointly. On complex initiatives like mine exploration projects, multiple industry-sector guidelines are applicable (Table 3.8).

Table 3.8. EHS Guidance Publications relevant to the Project

Title	Date
Environmental, Health, and Safety Guidelines for Waste Management Facilities	2007
Environmental, Health, and Safety Guidelines for Water and Sanitation	2007
Environmental, Health, and Safety Guidelines General Guidelines	2007
Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution	2007
Environmental, Health, and Safety Guidelines for Wind Energy	2015

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities at reasonable costs by existing technology. The applicability of the EHS Guidelines may need to be established for each project based on the results of an environmental, health, safety and social assessment where site-specific variables, such as host country context, assimilative capacity of the environment, and other project factors are taken into account. The applicability of specific technical recommendations should be based on the professional opinion of qualified and experienced persons.

Stakeholder engagement is an important part of complying with Equator Principles (Principle 5), IFC Performance Standards (PS 1) and EBRD Performance Requirements (PR1). The purpose of stakeholder engagement is to build and maintain a constructive relationship with affected communities. The nature and

frequency of engagement should be in-line with the risks to and adverse impacts on the communities. Engagement must be free of external manipulation, interference, or coercion, and intimidation, and conducted on the basis of timely, relevant, understandable and accessible information.

Disclosure of relevant project information helps affected communities understand the risks, impacts and opportunities of the project. If communities may be affected by risks or diverse impacts from the project, the project proponent must provide such communities with access to information on the purpose, nature and scale of the project, the duration of proposed project activities, and any risks to and potential impacts on such communities.

If affected communities may be subject to risks or adverse impacts from a project, consultation must be undertaken in a manner that affords affected communities the opportunity to express their views on project risks, impacts, and mitigation measures and have due consideration given to that input in project decision-making. This consultation should begin early in the ESIA process, focus on the risks and adverse impacts and the measures and actions envisaged for their mitigation, and be carried out in a manner that is inclusive and culturally appropriate.

For projects with potentially significant adverse impacts on affected Communities, an Informed Consultation and Participation (ICP) process should be conducted, which will result in the affected Communities' informed participation. ICP involves a more in-depth exchange of views and information, and an organized and iterative consultation, leading to the client's incorporating into their decision-making process the views of the affected Communities on matters that affect them directly, such as the proposed mitigation measures, the sharing of development benefits and opportunities, and implementation issues. The Stakeholder Engagement Plan (SEP) outlines how AzerEnerji will engage with stakeholders, in accordance with international good practice such as the IFC Stakeholder Engagement guide which covers stakeholder engagement.

AzerEnerji's HR management system will include policies and provisions to ensure the required quality standards for workers' accommodation and basic services, as per IFC PS 2. This includes ensuring that accommodation follows principles of non-discrimination and equal opportunity, and that accommodation arrangements will not restrict workers' freedom of movement or of association.

3.8.4. Gap analysis: World Bank's ESS and Azerbaijan's Legislation

The Table 3.9 below provides an analysis of the WB's Environmental and Social Standards (ESSs) relevant to AZURE in comparison with relevant Azerbaijani legislation. As noted, the more stringent of the requirements will apply.

Table 3.9. High-level summary of key gaps between the Bank's requirements and Azerbaijan's requirements

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts			
Scope of application	ESSs apply to Associated Facilities to extent of Borrower's control/influence	Associated facilities not covered by Azerbaijan EIA law	An ESIA covering the entire project prepared for this project
E&S Assessment	• E&S screening is required for all activities financed under the WB loan; • E&S impact assessment (ESIA), is required for all activities involving high and substantial risks of impact on social and physical environment; • equal requirements for assessment and management of social and environmental conditions and impacts; • Application of national framework, ESSs, EHSGs is required; • Offset significant residual impacts; • Sets up differential measures for vulnerable or disadvantaged people; • Consider E&S requirements for primary suppliers	• E&S screening is required only for the listed in Annex I of the law of EIA; • E&S impact assessment (EIA) is required for the activities provided in Annex I of law of EIA, and those included Annex I and determined as subject to EIA according to the screening procedure; • Law of EIA has much less emphasis on social conditions and impacts, however includes a provision on complex assessment of social and economic impacts. • Law on Protection of Public Health partly fill this gap, but do not fully cover social impacts mainly focusing on assessment of health impacts • Application of EHSGs is not required; • Do not offset significant residual impacts; • No differential measures for vulnerable and disadvantaged people are provided; • E&S requirements for primary suppliers are not considered	• ES screening is performed for all activities in accordance with ESS1 • An ESIA was prepared for this project • Social impacts and mitigation measures are included in the ESIA and E&S management and monitoring plans • Implementation of EIAs will be monitored in the project • In accordance with the ESIA, residual impacts will be mitigated where necessary • The project will take differential measures to ensure that vulnerable and disadvantaged groups are not disproportionately affected and can benefit equitably from the project. • The project considers requirements for key suppliers

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
		• No coverage of primary suppliers	
Project monitoring & reporting	• Permanent monitoring of the activities proportionates to nature of project, risks and impacts, and application of measures as per ESMP is required; • Several levels and timing of reporting, including to the World Bank is required	• Permanent monitoring of the activities and application of measures as per ESMP is not required. Monitoring is carried out randomly; • Majorly focused on quantitative monitoring paying less attention to other performance and compliance issues; • Requirement for reporting and its timing is determined by environmental decision, no permanent reporting on ESMP implementation is required	• As outlined in this document, all activities will require ongoing E&S monitoring and reporting. • Performance and compliance monitoring will be subject to particular attention throughout the project
Stakeholder engagement and information disclosure	For all projects involving E&S risks of impacts and benefits as well, information disclosure and engagement of the stakeholders is required through the life cycle of the project	• The EIA Law requires disclosure of information and public involvement during the EIA period. There is no requirement to involve stakeholders throughout the project life cycle • The processes required by law concerning public participation and consultations are also more limited under national practices than those envisioned by ESS1, not specifying, for example, engagement with academia and NGOs.	For this project, stakeholder engagement will adhere to both national regulations in Azerbaijan and the World Bank's Environmental and Social Framework (ESF). In Azerbaijan, stakeholder engagement is governed by the Law on Environmental Protection and the Public Participation in Decision-Making Process Law, which mandate public consultations and information disclosure for environmental projects. These national requirements align with the World Bank's Environmental and Social Standard 10 (ESS10), which emphasizes meaningful consultation, timely disclosure of relevant project information, and ongoing communication with stakeholders throughout

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
			the project lifecycle. To ensure compliance, the project will implement a Stakeholder Engagement Plan (SEP) that incorporates both local legal requirements and ESS10 guidelines, focusing on inclusive engagement, addressing stakeholder concerns, and ensuring transparency and accountability in the decision-making process.
ESS2: Labour and Working Conditions			
Scope of application	ESS2 applies to workers employed by AzerEnerji who work on the project and to contracted workers, primary supply workers, and community workers	Labour code of Azerbaijan applies to an employer's direct employees and contracted workers	LMP was developed for the Project which will be applicable to all workers related with Project and its sub-projects
Working conditions and management of labour relations	• Written labour management procedures • Terms and conditions of employment • Non-discrimination and equal opportunity • Worker's organizations	• Written employment contract required, including procedures and employment conditions • Specific non-discrimination and equal opportunity requirements • Organizations are allowed • Government's moratorium on labour inspections since November 2015, impedes active supervision or enforcement mechanism to monitor labour regulation implementation or apply remedial actions as needed to labour	LMP was developed for the Project which will be applicable to all workers related with Project and its sub-projects
Worker Health and Safety	• ESF provides detailed requirements for Labour and Working Conditions	• Azerbaijan's Labour Code are aligned with the ESF's standard for Labour and Working	• Lack of requirement to establish grievance mechanisms for employees;

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
	and application of World Bank Group and sector-specific EHS Guidelines is required; • Clear clarifications of overtime work, compensation and benefits, working conditions is required;	Conditions, but the Labour Code lacks an enforcement mechanism; • Clear Legal provisions on overtime work, compensation and benefits, assessment of young workers' working conditions are not provided; • No requirement for establishment of grievance mechanisms for employees;	• The OHS requirements of national legislation and ESS2 will be followed as specified in the Project LMP and EMP
Occupational Health and Safety (OHS)	• Measures relating to occupational health and safety applicable to the Project: • Apply World Bank Group General and sector-specific EHS Guidelines • Requirements to protect workers, train workers, document incidents, emergency preparation, addressing issues • Provide safe working environment • Workers allowed to report safety issues and refuse to work under certain circumstances • Provide appropriate facilities (canteens, toilets, etc.) and ensure accommodations meet needs of workers • All employers to collaborate on applying OSH requirements	• New (2018) law is generally in line with WB requirements but implementation requirements are not yet fully developed • Current legislation does not set minimum requirements for worker accommodations although it does require per diem for work at distances from home; the amount is low and payments over that level is subject to taxation. • OHS-related risks and non-compliances beyond the supervision by government authorities due to above said moratorium.	• Provisions of LMP will be applied to the Project related works • Expected lifting of the moratorium will enable for supervision and enforcement of labour legislation in line with good international practice.

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
	• Monitor OSH performance		
Protecting the work force	• Child labour • Forced labour	• The minimum working age in Azerbaijan is 15, children under 18 are not allowed to do dangerous work. • Employment is allowed between 15-18 years (with permission of parents/guardians). • A stricter application of the terms of the law is required.	• LMP was developed for the Project which will be applicable to all workers related with Project and its sub-projects • In this Project, employment will be offered to those who are at least 18 years old to work in AZURE project related work which may have hazardous potential. • Given that the Labour Code will be followed, which also prohibits child and forced labour, the risks related to labour flows and related gender-based violence (GBV) and labour resources, including child labour, are low. Mitigation measures to address GBV risks are included in the Company's Social Responsibility Policy and Discrimination, Harassment and Retaliation Policy. The LMP includes a generic sample Code of Conduct to be adopted by all contractors and other employers in the Project.
Contracted workers	• Reasonable efforts to verify contractors have labour management procedures to meet requirements of ESS2 (except those that apply to community and primary supply workers)	Azerbaijan national law applies to contracted workers including employees of subcontractors	Grievance mechanism will be developed for contracted workers specified in the Project LMP and EMP

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
	• Procedures for managing and monitoring performance • Access to grievance mechanism		
Community workers	Requirements for working conditions and OHS applied to community labour	No such requirements	Provisions specified in LMP will be applied to community workers
Primary supply workers	Depending on level of GSE/contractor control/influence assess risk of child labour, forced labour, and safety issues and require suppliers to address significant risks	No such requirements, although Azerbaijan law would apply to the suppliers	Provisions specified in LMP will be applied to primary supply workers
ESS3: Resource Efficiency and Pollution Prevention and Management			
Resource Efficiency			
Scope of application	Borrowers must apply feasible resource efficiency and pollution prevention measures in accordance with mitigation hierarchy	No specific requirements, however Azerbaijan law is generally consistent with EU legislation and directives	
Energy use	Adopt measures in EHSGs if project is significant energy use	There are not specific standards and rules for the efficient use of energy.	Project will follow EHSG requirements.
Water use	Assessment of water use needs and related impacts to the environment and communities and adopting relevant mitigation measures is required	National legislation prioritizes municipal water supply for domestic consumption over other types of water use. No specific requirements and principles of water sharing and prioritization (e.g. for irrigation, power generation, etc.) are stipulated explicitly.	Water use needs and associated impacts are assessed in the current ESIA and appropriate mitigation measures consistent with ESS3 will be implemented

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
Raw material use	Use GIIP to reduce significant resource usage	No specific requirements.	Not relevant for this project and no action will be considered for this item.
Pollution prevention and management			
General requirements	Avoid, minimize, and control release of pollutants, apply the more stringent of EHSGs and national law Historic pollution and non-degradation requirements	In general, requirements are consistent with ESS	
Management of air pollution	Requires assessment of potential air emissions and implementation of technically and financially feasible and cost-effective options to minimize emissions for all type activities	The requirement for assessment of potential air emissions and implementation of relevant mitigation measures for the activities where stationary air pollution sources do not exist, are not established;	The project assesses potential air emissions and will implement technically and financially feasible and cost-effective options to minimize emissions for all types of activities.
Management of hazardous and non-hazardous wastes	• Apply mitigation hierarchy to waste management • National and international conventions for hazardous waste management and movement • Verify hazardous waste management contractors are licensed and disposal sites operate to meet standards	• Mechanisms for non-hazardous waste separation and management are not developed • No significant gaps, but enforcement is not consistent • No specific requirements to verify contractor haulers or disposal sites	• A mitigation hierarchy will be applied to waste management • Contractors will be requested to develop Waste Management Plan in consistent best international practice
Management of chemicals and hazardous materials	• Minimize use of hazardous materials Avoid use of	No gaps identified. Little or no relevance to this project.	

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
	internationally controlled materials		
ESS4: Community Health and Safety			
Community health and safety			
Community health and safety	• Evaluate risks to community health and safety and apply mitigation hierarchy and GIIP to reduce risks • Consider third-party safety risks in designing infrastructure and equipment, with regard to high-risk locations • Ensure safety of services provided to communities Identify traffic/road risks, assess risks if needed, consider safety in fleet decisions, take measures to protect public • Assess and avoid impacts on provisioning and regulating ecosystem services as appropriate • Avoid or minimize potential for disease transmission and communication, considering vulnerable groups • Address risks to community of hazardous materials management • Prepare of and respond to emergencies, consider in EIAs, prepare response plans	EIA law requires assessment and control • No specific requirements for design, or GIIP • No services to be provided • General traffic laws apply, and EIA law requires assessment of risks • No specific requirement for ecosystem services • No specific requirements for labour influx, including genderbased violence, communicable diseases, etc. • General health requirements generally meet ESS, but no requirement for vulnerable groups • Detailed requirements for emergency planning	• Projects' Environmental and Social Management Plans (ESMPs) will should include requirements for establishing a • code of conduct for all project staff that includes sexual exploitation, • abuse, and harassment (SEAH) prevention and mitigation • The contractors will be requested to draft rules and practices, as well as mechanisms to engage with and inform communities of the potential risks and hazards early in the project cycle and throughout implementation.

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
Security personnel	• Assess and address risks of security arrangements • Apply principles of proportionality, GIIP, and law • Verify contracted workers are not implicated in past abuses and are trained Investigate incidents, report unlawful acts to authorities	No specific requirements, however limitations on armed security personnel	ESMP will include measures to manage the security risks of the Project, including the risks of engaging security personnel to safeguard project workers, sites, assets.
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement			
Applicability	• Assessment of needs for Land Acquisition, Restrictions on Land Use and Involuntary Resettlement during ESIA process is required; • Applies to permanent and temporary displacement, listing types of infringements • Assessment of impacts, compensation and rehabilitation measures consistent with ESS5 will be applied, as outlined in the Project Resettlement Action Plan. • Applies to land users (formal and informal) and owners	• Assessment of needs for Land Acquisition, Restrictions on Land Use and Involuntary Resettlement during EIA process is not required. Only environmental impacts resulting to social impacts are included; • Applies only to the legal and 'legalizable' owners (i.e., ones with legitimate claims to land and property that may be registered under national law), not to illegal land users	Assessment of impacts, compensation and rehabilitation measures consistent with ESS5 will be applied, as outlined in the Project's Resettlement Policy Framework.
General	• Design project to avoid/minimize displacement; • Provide replacement cost and assistance (including	• No specific requirement to avoid displacement • Provide replacement cost and offer land for-land payments where possible, no	• As outlined in the Project Resettlement Policy Framework, ESS5-compliant impact assessment, compensation and

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
	livelihood restoration), disclose standards, offer land-for-land where possible, pay compensation before displacing people where possible; • Engaged with affected communities, including women and other vulnerable groups; • Establishment of GM is required; • Census, cut-off dates, notices; detailed plan and monitoring is required; • Require audit if significant displacement	requirements for livelihood restoration or other allowances; • No requirements for public consultations, and no additional requirement to women and other vulnerable groups; • No requirement for establishment of GM (beyond measures envisioned in the Administrative Code of Azerbaijan); • No requirements for cut-off dates, notices; detailed plan and monitoring; • No requirement for displacement audit	rehabilitation measures will be implemented. • The complaint handling mechanism will be created and implemented by AzerEnerji JSC in accordance with ESS5
Displacement	Detailed requirements for assessment of physical and economic displacement, including special consideration for vulnerable people consultations, livelihood restoration and development relevant mitigation measures	• Detailed requirements for physical and economic displacement, compensation of the loss of houses, lands and goods, • No special consideration for vulnerable people	Assessment of impacts, compensation and rehabilitation measures consistent with Azerbaijani legislation and ESS5 will be applied, as outlined in the Project's Resettlement Policy Framework
Collaboration with other responsible agencies or subnational jurisdiction	Provides requirements for all involved agencies to be involved and support PIU in Land Acquisition and Involuntary Resettlement procedures, including development and implementation of Resettlement Action Plan (RAP)	For Land Acquisition and Involuntary Resettlement procedures involvement of other parties are also required, but specific collaboration and support requirements are not provided	Assessment of impacts, compensation and rehabilitation measures consistent with ESS5 will be applied, as outlined in the Project's Resettlement Policy Framework

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
Grievance handling	Complaints and grievances are resolved with community participation at the Grievance Commission (GCC), Local government bodies and NGOs and/or Community Based Organizations (CBOs) at the local level.	Grievance Redress Committee (Land Acquisition for State Purposes - TDEA Act, Section 75, 2010) will be appointed in large scale projects as necessary. The Executive Body, Land Acquisition Group, Supervisory Body, local Executive Authority, municipalities and the PIU shall receive, investigate and resolve complaints and grievances.	This project implies compliance with ESS5
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources			
General	• ESS 6 classifies habitats into transformed, natural and critical habitats. ESS requirements apply to all groups equally and requires relevant mitigation and compensation measures for expected impacts; • Sets strict requirements for affecting critical habitats, requires Biodiversity Management Plan (BMP)	• Azerbaijan has a strong regulatory framework for protecting, conserving, and restoring biodiversity. However, less attention is given to preserving habitats. There is no differentiated approach for transformed, natural, and critical habitats • No requirements for affecting critical habitats and developing BMP	ESS6 requirements will apply to the Project, including assessment of critical habitats and development of a BMP where applicable
Primary suppliers	Requirements when Borrower purchases natural resource commodities	Not relevant for this project	
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities			
	Not applicable for the project		
ESS8: Cultural Heritage			

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
Application	Covers tangible and intangible (limited) cultural heritage, whether legally protected or not and whether previously identified or not	Equivalent applicability. Intangible cultural heritage can be registered, and it is protected similarly to other cultural heritage objects, although assessments for impacts is generally not required or practiced.	The alignment of OHLs was designed in a manner to avoid or minimize encroachment with tangible and intangible (limited) cultural heritage
General	Requires development and following the chance find procedure if a find is encountered; Requires involvement of Cultural Heritage experts if project provides risks of impacts to the monuments of Cultural Heritage	Azerbaijan Law on Cultural Heritage provides required procedures in case of chance findings. No requirements for developing project specific chance find procedures	Public cultural heritage sites at village level were identified through online stakeholder consultations, focus group consultations and field surveys. The identified objects were highlighted in the ESIA and subsequent protection measures were proposed
Stakeholder consultation and identification of cultural heritage	• Identify and consult with affected and interested stakeholders • Maintain confidentiality if needed • Allow continued access to affected sites	• No specific requirements for stakeholder identification and consultation • No provisions for confidentiality	Local government representatives and cultural heritage protection agency were consulted regarding the presence and value of culturally important objects along the OHL's alignment
ESS9: Financial Intermediaries			
	Not applicable for the project as the Project does not have any financial intermediaries		
ESS10: Stakeholder Engagement and Information Disclosure			
Requirements	• Engage stakeholders throughout project life cycle, determine how they wish to be engaged Provide stakeholders with information,	• Basic legal background exists in Azerbaijan concerning public participation and information disclosure. • ESIA legislation requires scoping as well as disclosure of and consultation on EIA	SEP prepared for the Project will be followed throughout the implementation of the Project

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
	Maintain documented record of engagements		
Engagement during project preparation	• Requires identification and analysis of stakeholders, including disadvantaged or vulnerable groups; • Disclosure, timing of consultations, measures for disadvantaged or vulnerable groups, etc. preparation of a Stakeholder Engagement Plan (SEP) with detailed requirements is required; • Early disclosure of information to allow consultation in design phase • All stakeholders will be meaningfully consulted and their input will be taken into account during the design and implementation stages of the project.	• Absence of special requirements for stakeholder identification and analysis; • Stakeholder engagement and information disclosure requirements are included in the screening, scoping and EIA process. SEP development is not required; • Disclosure and consultation are not required at the initial design stage	• Stakeholders, including vulnerable and disadvantaged groups, were identified and analyzed during project development. • Stakeholder Engagement Plan (SEP) was prepared in accordance with the guidelines of ESS10. • As outlined in the project's SEP, meaningful consultation and information will be shared with stakeholders throughout the life of the project.
Engagement during project implementation and external reporting	Engagement and disclosure of information to continue throughout implementation, following Plan	No similar requirement	SEP prepared for the Project will be followed throughout the implementation of the Project
Grievance Redress Mechanism General	• Build and implement a fast, effective, culturally appropriate and flexible GM; • Both informal and formal complaints should be dealt with equally. Procedures for handling	• Absence of requirements for establishment and maintenance of GRM; • Only official correspondence and claims are recorded and responded to.	• The AZURE project will operate a grievance redress mechanism in accordance with the requirements of ESS10 and as described in SEP. • A GRC will be formed by AzerEnerji-PIU at the local level which shall consist, as a minimum, of representatives

ESS &Topic	Major requirements	Key requirements/gaps in Azerbaijan Legislation	Rules to be applied to the project
	anonymous complaints are required		from: (i) the people, through recognized local leaders (e.g., officials of local executive power); (ii) the Contractor; (iii) Owner's Engineer (OE), to represent AzerEnerji-PIU). The GRC will act as the mediator between aggrieved parties and will make efforts to resolve conflicts through mutual consent. • The court of the law will be the last resort. In principle, the Project- Affected Parties can appeal to a relevant court anytime they disagree with the activity or inaction of the Project Implementors. • The protocols and procedures for serious grievances will be developed

The project will be prepared and implemented under the WB ESF/ESS. In particular, in the event of any inconsistency, that of the World Bank ESF/ESS will prevail.

3.9. Regional Processes

3.9.1. European Union

EU relations with Azerbaijan are governed primarily by the EU-Azerbaijan Partnership and Cooperation Agreement (PCA) and the European Neighbourhood Policy (ENP). The PCA entered into force in 1999. Under Article 43: "The Republic of Azerbaijan should endeavour to ensure that its legislation will be gradually made compatible with that of the Community".

As part of the PCA an EU assessment of Azerbaijan's environmental legislation against EU Directives identified a number of recommendations for the approximation of national legislation with EU Directives[2]. Based on this, a draft national programme was developed that emphasises a flexible approach to amending national legislation to take account of institutional capacity and cost[3].

Following the enlargement of the European Union, the EU launched the ENP and Azerbaijan became part of this policy in 2004. The current National Indicative Programme for implementing the ENP4 includes a commitment to support legislative reform in the environmental sector, including:

- Approximation of Azerbaijan's environmental legislation and standards with the EU's;
- Strengthening management capacity through integrated environmental authorisation;
- Improved procedures and structures for environmental impact assessment; and
- Development of sectoral environmental plans (waste / water management, air pollution, etc.).

3.9.2. EU4Environment

EU4Environment[5] is a partnership of member states, including Azerbaijan, and other organisations within the UNECE region. Under the auspices of the Environment for Europe a series of ministerial conferences on the environment were held which resulted in the establishment of UNECE conventions.

3.10. Stakeholder Engagement Standards

A. National Framework

Pertinent to the Stakeholder Engagements, the Constitution of Azerbaijan as the fundamental law of the land, among others, establishes the legislative principle for the engagement of the citizens in political and civil life of Azerbaijan; thus, provides for the following:

- The Right to civil participation is stipulated in Article 54.1 - "right of citizens of the Republic of Azerbaijan to participate in the political and civic life without impediments".
- Freedom of Information – The Constitution guarantees the right to information in three aspects:

2 Mammadov, A. & Apruzzi, F. (2004) Support for the Implementation of the Partnership Cooperation Agreement between EU- Azerbaijan. Scoreboard Report on Environment and Utilisation of Natural Resources. Report prepared for TACIS.
3 SOFRECO (undated) Support for the Implementation of the PCA between EU-Azerbaijan, Draft Programme of legal Approximation.
4 European Commission, 2007. European Neighbourhood and Partnership Instrument, Azerbaijan National Indicative Programme (NIP).
5 United Nations Economic Commission for Europe UNECE (2008) Environment for Europe. Available at: http://www.unece.org/env/efe/welcome.html Accessed August 2015.

- Article 39 (Right to live in a healthy environment) – "Everyone has the right to gain information about the true ecological situation and to get compensation for damage done to his/her health and property because of violations of ecological requirements";
- Article 50 (Freedom of Information) – provides that − Everyone is free to look for, acquire, transfer, prepare and distribute information; − Freedom of mass media is guaranteed. State censorship in mass media, including press is prohibited.
- Article 57 para 1 - which gives citizens the right to petition state bodies.

Law of the Republic of Azerbaijan No 1308-IVQ dated September 30, 2015 "On Citizens' Appeals"

According to the law, any citizen has a right to appeal to state and municipal bodies, and to legal entities owned by state or municipality, in written or oral form and these appeals have different procedure from appeals to Ombudsman or information requests, and may not be anonymous.

Law of the Republic of Azerbaijan dated September 30, 2005 "On the right to obtain information".

This Law establishes the legal framework for ensuring free, unrestricted and equal information access as prescribed by Article 50 of the Constitution, whereby any person is entitled to apply directly or via his /her representative to the information owner and to choose the type and form for obtaining the information.

Law of the Republic of Azerbaijan № 816-IVQ (November 22, 2013) "On public participation".

This law provides the framework and regulates the involvement of citizens in the implementation of state management in accordance with the Article 49 (Freedom of assembly) of the Constitution. The law stipulates that public participation consists of:

- Participation in various areas of state and public life, the preparation and implementation of the state policy and the adoption of national and local decisions;
- Participation in public control over the activity of central and local executive authorities, local self-government bodies;
- Participation of civil society institutions in the process of consultations of state and local selfgovernment bodies with the public and in the study of public opinion (through Public Councils).

The law considers the following forms of public participation:

- Public Councils under central and local executive authorities, local self-government bodies;
- Public discussions during the adoption of decisions of public important;
- Public hearings on draft legal acts and different issues of state and public life;
- Study of public opinion;
- Public discussion of draft legal acts;
- Written consultations on the study of opinions of civil society institutions on draft legal acts.

In addition to the described legislative acts, the environmental and social impact assessment process also should include disclosure and stakeholder engagement activities, as per Azerbaijan legislation.

The Law on Environmental Impact Assessment (EIA Law, 2018) covers scope, procedure and responsibilities for Environmental Impact Assessment, as well as public consultation and disclosure requirements during environmental assessment.

According to the Law the Client (Implementing Agency) has to inform the local population and society in the project area through the media and public hearings and inform them of the results of the EIA before committing the intended activity (Article 12.1.4).

The Client should conduct public hearings in accordance with the Law of the Republic of Azerbaijan “On Public Participation” and involve individuals, legal entities, as well as property owners (Article 4.10). Information on the results of the public hearings and discussions should be included in the EIA document (Article 5.3.12).

The law also specifies the responsibilities of municipalities for the public hearing activities (Article 11). Thus, the relevant municipality in the area, where the project (or intended activity) is implemented, must take part in the implementation of the EIA and provide the necessary information required for the preparation of the EIA document.

In addition, the municipalities should assist people and legal entities, real estate owners, as well as other stakeholders (non-governmental organizations, citizens' initiative groups and neighborhood committees of municipalities, etc.) to participate in public consultations, if requested by them. In addition, people and civil society institutions have the right to request the client and the planning organization to hold public hearings on the EIA (13.2.2).

In addition, people and civil society institutions have the right to request the client and the planning organization to hold public hearings on the EIA (13.2.2).

Similarly, Article 15 of the Law on Acquisition of Land for State Needs (2010) requires public meetings on social impacts. Public meetings should be organized and documented by the Client. The objectives of these consultations are to listen and record any statements or objections made by local residents, interested person or representative of the organization on the issues related to the proposed project, and to discuss alternative proposals, as well as to inform the society on the grievance redress process and other related matters.

The law also stipulates a requirement for disclosure of the land acquisition and resettlement related information and documents through public consultation and official announcements. Specifically, article 14 demands the Client to disseminate an official announcement on the affected land/property in the area where the affected lands are located and shall take all measures to deliver this announcement to the affected persons.

The above legislations are considered positive steps in ensuring engagements of the general citizenry on matters of public interest. However, a study6 on Public Participation in Environmental Decision-Making in Azerbaijan stated the following observations:

Notwithstanding reference to Public Environmental Review (PER), the Law on Environmental Protection does not provide any connection between public participation process and decision-making other than stating that "Findings of PER have recommendational and informational character.

Legislative and regulatory frameworks also lack clear procedures for holding public hearings on environmental matters

The study further recommends that these gaps require existing legislative and regulatory frameworks' further revision and development for conforming to the Århus Convention.

As a step forward, Azerenerji shall take cognizance of the above relevant legislations and notations to ensure that legal requirements on citizen engagement and disclosure are complied with.

B. World Bank

The World Bank's Environmental and Social Framework (ESF) came into effect on October 1, 2018. The Framework includes Environmental and Social Standard (ESS) 10, "Stakeholder Engagement and Information Disclosure", which recognizes "the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice". ESS10 emphasizes that effective stakeholder engagement can significantly improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. As defined by ESF and ESS 10, stakeholder engagement is an inclusive process conducted throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project's environmental and social risks. Key elements of ESS10 include:

Stakeholder engagement is most effective when initiated at an early stage of the project development process, and is an integral part of early project decisions and the assessment, management and monitoring of the project.

Borrowers will engage with stakeholders throughout the project life cycle, commencing such engagement as early as possible in the project development process and in a timeframe that enables meaningful consultations with stakeholders on project design. The nature, scope and frequency of stakeholder engagement will be proportionate to the nature and scale of the project and its potential risks and impacts.

6https://www.academia.edu/44606336/Public_Participation_in_Environmental_Decision_making_The_case_of_Azerbaijan

Borrowers will engage in meaningful consultations with all stakeholders. Borrowers will provide stakeholders with timely, relevant, understandable and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination and intimidation.

The process of stakeholder engagement will involve the following, as set out in further detail in this ESS: (i) stakeholder identification and analysis; (ii) planning how the engagement with stakeholders will take place; (iii) disclosure of information; (iv) consultation with stakeholders; (v) addressing and responding to grievances; and (vi) reporting to stakeholders.

The Borrower will maintain and disclose as part of the environmental and social assessment, a documented record of stakeholder engagement, including a description of the stakeholders consulted, a summary of the feedback received and a brief explanation of how the feedback was taken into account, or the reasons why it was not.

ESS10 par. 21 stresses on the need for meaningful consultation "in a manner that provides stakeholders with opportunities to express their views on project risks, impacts, and mitigation measures, and allows the Borrower to consider and respond to them Meaningful consultation will be carried out." ESS10 par. 21 elucidates "meaningful consultation" as a two-way process, that:

- Begins early in the project planning process to gather initial views on the project proposal and inform project design;
- Encourages stakeholder feedback, particularly as a way of informing project design and engagement by stakeholders in the identification and mitigation of environmental and social risks and impacts; on an ongoing basis as the nature of issues, impacts and opportunities evolves;
- Continues on an ongoing basis, as risks and impacts arise;
- Is based on the prior disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information in a timeframe that enables meaningful consultations with stakeholders in a culturally appropriate format, in relevant local language(s) and is understandable to stakeholders;
- Considers and responds to feedback;
- Supports active and inclusive engagement with all project-affected parties;
- Is free of external manipulation, interference, coercion, discrimination, and intimidation; and
- Is documented and disclosed by the Borrower.

C. IFC

The IFC Performance Standards stress that public consultation should be started early in project development and that the stakeholder engagement at every stage should be free of intimidation or coercion, timely and aimed at providing relevant, understandable and accessible information. IFC has published a handbook titled "Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets". The handbook provides a comprehensive overview of good practices in stakeholder engagement, with a dedicated focus on stakeholder groups that are "external" to the projects, such as affected communities,

local government authorities, non-governmental and other civil society organizations, local institutions, and other interested or affected parties.

Specific requirements set out by the IFC Guidelines are divided into the following categories with respective recommendations:

1. Stakeholder identification and analysis

Stakeholder identification process must first of all address directly and indirectly affected stakeholders. Identification shall use a systematic approach based on zoning of the Project impacts followed by identification and mapping of all potentially affected stakeholders.

Stakeholders that are rather interested in the Project than affected by it shall be identified, mapped and analyzed.

All identified stakeholders must be prioritized, depending on who they are and what interests they might have in the Project, figuring out the most appropriate ways to engage them. Prioritization must consider how a stakeholder will be affected by the project or will affect the project itself, the level of stakeholder vulnerability, its' interests in and attitude towards the Project, etc.

If a project is an expansion of a prior investment or operation, reference shall be made to the stakeholder information and consultations made in the past. Possible sources of prior information include existing stakeholder databases, consultation and grievance logs, previous ESIA studies and consultations, annual monitoring reports, community investment plans of the company, local government, or other businesses in the same locality.

As part of the stakeholder analysis, socioeconomic fact sheets - descriptions of the social and cultural dimensions of the project area, should be developed with a focus on vulnerable groups. The fact sheets shall include information on demographic characteristics of the local population, the status of women, economic livelihoods, land tenure, social organization and power dynamics, education and healthcare, ability to access technical information, cultural values and perceptions.

To make data dissemination and receiving stakeholder feedbacks effective, representatives of each stakeholder group should be selected and analyzed for their ability to serve as a liaison between the Project staff and respective stakeholders.

During stakeholder identification and analysis, the studied stakeholders shall be engaged with in a venue which is suitable and comfortable for themselves (e.g. affected communities, interested organizations, etc.).

It should be remembered that a key stakeholder of any project is the government. Keeping this in mind, good working relationships shall be established and maintained with different level governmental authorities, and they must be kept informed of the project's activities and anticipated impacts.

Another key stakeholder category which shall not be ignored, are NGOs and CBOs, particularly those who represent the project affected communities.

Stakeholder identification and analysis should seek advice from those Project staff members who are the representatives of the Project affected communities.

2. Information disclosure

Types of information requiring to be disclosed as part of the stakeholder engagement process, include (i) the purpose, nature and scale of the project; (ii) duration of the proposed activities; (iii) any risks to and potential impacts on such communities and the relevant mitigation measures; (iv) the envisaged stakeholder engagement process; and (v) the grievance mechanisms.

Steps should be taken to increase transparency and accountability as a means of promoting understanding about the project and engendering public trust. When disclosing the information, it has to be remembered that a lack of information can lead to the spread of misinformation about a project that can be both damaging to a company's reputation, and undermine efforts to engage in an informed dialogue with stakeholders.

Information that needs to be disclosed as part of the stakeholder engagement process, must be delivered as early as possible, be objective, meaningful, easily accessible, and open for feedback and consultations.

When selecting information for the disclosure, all possible risks and benefits of disclosure must be identified and considered. Information may be not disclosed for the reasons of commercial confidentiality and proprietary issues, personal privacy, safety and security, or at the situations where releasing information very early might raise unnecessary public expectations or cause speculative behaviour. However, considerations for non-disclosure need to be weighed against the need for stakeholder groups to be informed in order to protect their interests.

Information on sensitive and controversial issues (e.g. land acquisition and resettlement) must be communicated and managed effectively. It can be obtained by disclosure during face-to-face consultations, explaining the associated uncertainties and ways to prevent them, etc.

3. Stakeholder consultation

For projects that have environmental and social impacts, consultation should not be a single conversation but a series of discussions enabling understanding about the project among those it will likely affect or interest, and to learn how these external parties view the project and its attendant risks, impacts, opportunities and mitigation measures.

Stakeholder consultation must be conducted in an interactive and adequately planned way, ensuring that it is known who needs to be consulted, over what topics, and for what purpose, and that there is comprehensive information on hand regarding every specific discussed topic.

Consultation must be context specific. This means that techniques, methods, approaches and timetables will need to be tailored for the local situation and the various types of stakeholders being consulted. Ideally, a

good consultation process must be targeted, early, informative, meaningful, two-way, gender-inclusive, local context aware, free from manipulation, properly documented and ongoing.

Informed Consultation and Participation process must be conducted through enabling a more in-depth exchange of views and information, leading to joint analysis and decision-making. With this purpose in mind, stakeholders must be properly informed and encouraged to participate in matters that have direct bearing on them, including proposed mitigation measures, the sharing of development benefits and opportunities, and implementation or monitoring issues.

Consultation process must capture both men's and women's views regarding impacts, mitigation mechanisms, and benefits of the project.

Consultation must be tailored to the language preferences of the affected communities, and the needs of disadvantaged or vulnerable groups.

Consultation process and results must be properly documented and reported back to the stakeholders together with information on how concerns have been considered.

4. Negotiation and partnerships

Negotiations with stakeholders should be conducted in "good faith", be transparent, considerate of the available time of the negotiating parties, and deploy negotiation procedures and language readily understood and agreed to by all parties. Key principles to keep in mind during negotiations are the involvement of legitimate representatives, willing engagement free from coercion or intimidation, joint exploration of key issues of importance, equal access to the best available information, use of participatory approaches, accessibility in terms of timing and location, provision of sufficient time for decision-making, mutual respect and sensitivity for cultural and other differences, flexibility, consideration of multiple options, and the willingness to compromise.

All negotiation outcomes must be properly documented and reported.

A grievance mechanism shall be established to address any issues arising from the implementation of the achieved agreement.

The project shall lie strategic partnerships with communities and/or other stakeholders, such as government or NGOs. Strategic partnerships are about joint activities and collaborative efforts which can lead to bringing different parties together in resolving various challenging issues, e.g. environmental stewardship, public health, social inclusion, community investment, etc.

5. Grievance management

A grievance mechanism must be established for the Project to receive and facilitate resolution of stakeholder concerns and grievances about the environmental and social performance. Ideally, the mechanism should be in place from the beginning ESIA process and exist throughout construction and operations through to the end of project life.

Developed mechanism shall be transparent and fair.

Grievance mechanism should be designed to fit the context and needs of the project. Thus, large and more complex projects need a more formalized process and mechanism, and a higher level of dedicated resources for receiving, recording, tracking, and resolving complaints.

Grievance procedures should be put into writing, publicized, and explained to relevant stakeholder groups.

If needed, grievance responses can be ensured through involving third party consultants to serve as mediators between the project and the stakeholders.

To make grievance procedures easily accessible, the project must hire special employees to manage received grievances, and ensure that there are specialized people working in the affected communities to receive grievances at place.

Certain time frame should be set and followed for responding the recorded complaints (could 48 hours, one week or 30 days).

All received complaints, as well as the measures undertaken to resolve them, shall be properly recorded and reported back to the stakeholders.

The Project must issue periodic (not less than annual) grievance reports and disseminate them between the stakeholders.

If the project is unable to resolve a complaint, it may be appropriate to enable complainants to resort to external experts.

6. Stakeholder engagement in project monitoring

To satisfy stakeholder concerns and promote transparency, it is suggested that project-affected stakeholders are involved in the monitoring of the implementation of mitigation measures or other environmental and social programs of the Project.

If necessary, stakeholder representatives selected for monitoring shall go through capacity building and training to increase their respective technical skills.

Monitoring shall be organized in a participatory manner, ensuring physical presence of the affected individuals at the time that monitoring takes place.

Additionally, external monitor can be involved to strengthen project accountability and credibility of monitoring results. For particularly complex or controversial projects, where objectivity and transparency are key, it can be good practice to establish an independent monitoring panel or group to oversee and report on the project's environmental and social performance.

7. Sustainability reporting

In addition to reporting back to project-affected groups and other stakeholders as part of the consultation process, it is recommended to develop sustainability reports, providing companies with an opportunity to communicate information to a much wider range of stakeholders about the environmental, social, economic, and governance performance of the projects. Sustainability reporting also offers a platform to report back on the process of stakeholder engagement itself.

Stakeholder consultation results and commitments shall be tracked, for which it is recommended to use specialized software packages developed for such purposes and listed in the Handbook.

Sustainability reports must be developed and communicated in a way that is compliant with respective international standards, listed in the Handbook.

8. Management functions

Project managers need to identify critical points in the life of the project where stakeholder engagement will be needed and determine who will deliver these actions and how they can be integrated with core business functions. This involves trying to work out how best to deliver and integrate a number of different aspects of engagement, including:

- ongoing stakeholder analysis and the assessment of stakeholder concerns from a "risk" perspective.
- hiring and training of community liaison officers.
- planning consultation processes in a way that meets the company's own policies and/or compliance requirements of lenders and regulators.
- input and suggestions received from stakeholders on project design and proposed mitigation measures.
- grievance mechanisms that capture and respond to stakeholder concerns.
- involvement of local stakeholders in project monitoring.
- reporting information to stakeholders.

As the IFC information disclosure and stakeholder engagement requirements are more comprehensive than the requirements that are valid in Azerbaijan, compliance with national requirements will be fulfilled through the implementation of IFC requirements.

C. European Union

Primary aspects related to stakeholder engagement are linked to the EIA Directive (85/337/EEC), adopted in line with the requirements of Aarhus Convention on Public Participation in Decision-making and Access to Justice in Environmental Matters and the Espoo Convention on EIA in a Transboundary Context. Aarhus and Espoo Conventions have been ratified by Azerbaijan in 1999.

It is important for the Project to comply with the following principles raised by the Aarhus Convention:

Access to information: it will be ensured that the stakeholders have timely access to all kinds of the information related to the Project design and implementation.

Public participation: from the very early stage of design, stakeholders will be given an opportunity to contribute to the Project's decision-making process.

Access to justice. In case there will occur the violations of the above two principles, there will be a legal mechanism established to allow stakeholders appeal to the courts.

As there are no transboundary impacts expected from its' implementation, requirements set by the Espoo Convention are not considered actual within the current Project's framework.

Aarhus and Espoo Conventions differ from international standards below in that the responsibility for disclosure, participation and access to justice resides with the host government and not the project sponsor. However, government representatives can only fulfil the requirements of the Conventions if a project sponsor has fully disclosed all information relating to environmental and social impacts.

D. OECD Common Approaches

Common Approaches for Officially Supported Export Credits and Environmental and Social Due Diligence (the 'Common Approaches') of the OECD includes following stakeholder related recommendations:

- ESIA reports and related information should be made available to affected communities in language accessible to them for at least 30 days
- OECD member countries should encourage protection and respect for human rights and foster transparency, predictability and responsibility in decision-making by encouraging disclosure of ESIA information.

E. Equator Principles

The Equator Principles are a set of guidelines that aim to help financial institutions identify, assess and manage environmental and social risks when financing projects. One of the key aspects of the Equator Principles is stakeholder engagement. The Equator Principles provide the following guidance on stakeholder engagement:

- Stakeholder engagement should be inclusive, meaningful, culturally appropriate, and tailored to the specific context and needs of the stakeholders.
- Stakeholder engagement should start early in the project development process and continue throughout the project lifecycle.
- Stakeholder engagement should be based on disclosure of relevant and understandable information about the project, its potential impacts and mitigation measures, and the grievance mechanism.
- Stakeholder engagement should involve consultation with the stakeholders to solicit their views and feedback, and to address their concerns and expectations.
- Stakeholder engagement should include informed consultation and participation (ICP) for projects with significant adverse impacts on affected communities.
- Stakeholder engagement should be documented and reported to demonstrate how the stakeholder views and feedback have been taken into account and how the issues raised have been addressed.

3.11. Red Book of the Republic of Azerbaijan

A “Red book” of Azerbaijan Republic7 is carried out according to the law No. 675-İQ dated on June 4, 1999 of Azerbaijan Republic “On animal world” and the law No. 678-İQ dated on June 8, 1999 of Azerbaijan Republic “On protection of environment”. According to existing legislation, animal and plant species that live in natural condition in country’s territory and which considered rare and have the threat of extinct of generation are specially protected and entered into “Red book” of Azerbaijan Republic. “Red book” of Azerbaijan Republic, being official document, reflects in itself the condition of animal and plant species (subspecies, populations), their existence and protection measures in all territory of Azerbaijan Republic, as well as, section of the Caspian Sea (lake) that belongs to Azerbaijan Republic.

The third edition of the "Red Book" was published in 2023. The edition contains information on 460 higher and primitive plants, as well as 47 fungi and 241 fauna species, their distribution, number and decline trends, as well as their bioecological and phytocoenological characteristics, limiting factors and protection measures. Also, 51 species of plants, 49 of which are higher and 2 are primitive, were included in the pink list, which was compiled for the first time in 2023. With the use of the GIS system (ArcGIS10 software), species distribution maps were drawn up and a modern assessment of their conservation status in nature was carried out according to the categories and criteria of the International Union for Conservation of Nature (IUCN).

7 https://www.azerbaijans.com/content_1706_en.html

3.12. IUCN Red Data Book

In 1948, the International Union for Conservation of Nature and Natural Resources (IUCN) was established to bring together state, scientific and public organizations for the conservation of wildlife in many countries around the world. One of the main decisions of this organization was made in 1949 with the establishment of the Species Survival Commission. The main tasks of the Commission are to study endangered and rare plant and animal species, to develop international and regional conventions, agreements and projects for their protection, to prepare a species inventory, and to develop relevant protection recommendations. The main purpose of the commission is to compile a list of endangered animals. This list was later renamed the International Red Data Book. The Red Data Book has been published several times. Thus, 1978-1987 edition included 226 species and 79 subspecies of mammals, 181 species and 77 subspecies of birds, species and 21 subspecies of reptiles, 35 species and 5 subspecies of amphibians, 168 species and 25 subspecies of fish.

The Red Data Book (ICRC) is updated continuously. This document is a permanent, updated and valid document. In 1996, a new version of the Red Data Book was published. For more than 20 years, the status of species and subspecies has been assessed on a general (global) scale, depending on the degree of threat of their extinction. The last update has been made in 2007.

IUCN has classified the Red List animals into the following categories:

- Extinct (EX)
- Extinct in the Wild (EW)
- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near Threatened (NT)
- Least Concern (LC)
- Data Deficient (DD)
- Not Evaluated (NE)

The fauna and flora of a country included in the International Red Book must be included in the national Red Book of that country.

3.13. Environmental Policy of AzerEnerji

AzerEnerji, the main electricity generation and distribution company in Azerbaijan, does not have a publicly available environmental policy document specifically outlining its commitments and goals. However, their practices and initiatives suggest a focus on the following environmental considerations:

1. **Modernization and Efficiency**: AzerEnerji has invested in modernizing its power plants and infrastructure to improve energy efficiency and reduce environmental impact. This includes upgrading equipment, implementing advanced technologies, and optimizing operations.

2. **Renewable Energy Integration**: While the majority of Azerbaijan's energy generation comes from fossil fuels, AzerEnerji has expressed interest in increasing the share of renewable energy sources in its portfolio. This aligns with the government's broader goals to diversify the energy mix and reduce reliance on fossil fuels.
3. **Environmental Impact Assessments**: For new projects and expansions, AzerEnerji conducts environmental impact assessments (EIA) to identify and mitigate potential negative environmental effects. This process involves evaluating potential impacts on air and water quality, biodiversity, and other environmental factors.
4. **Compliance with Regulations**: AzerEnerji operates in accordance with national environmental regulations and standards. This includes adhering to limits on emissions, waste disposal, and other environmental aspects of its operations.
5. **Community Engagement**: The company engages with local communities and stakeholders to address environmental concerns and ensure that its operations are conducted in a socially responsible manner. This includes informing the public about its activities, addressing complaints, and participating in community development initiatives.

3.14. Project Standards and Assessment Criteria

AZURE project will be implemented and managed in accordance with the relevant national and international environmental standards as described in Chapter 3 of the ESIA.. The project standards for ensuring environmental and social compliance of project activities are considered to be the World Bank ESF ESSs, and the standards in the following sections, including those below, are consistent with the World Bank ESSs :

- Background pollutant concentrations. Relevant for fertile soil cover.
- Maximum allowable concentrations (MACs) of toxic and potentially toxic chemical elements, compounds and substances. Valid in Azerbaijan. Relevant for air, soil and drinking water.
- International environmental quality standards for the air, soil, settlements and drinking water. Valid in the Commonwealth of Independent States (CIS). In some cases, when the drinking water MACs are absent, reference is made to the relevant EU and WHO standards;
- The World Bank’s environment, health, safety, pollution prevention and reduction guidelines.

In line with the WB ESS 3, the Project standards were established for each of the identified sources of pollution and wastes, taking into account capacity of the environmental agents to accept, disperse and absorb the pollutants.

The following tables compare international standards for each environmental quality component. The applied Project standards are highlighted in bold and described in the following tables.

3.14.1. Water quality

The project will comply with WBG EHS guidelines water quality standards, highlighted in bold in the Table 3.10 below.

Table 3.10. Water quality standards

Parameter	Azerbaijan (drinking water)[8]	WHO, drinking water[9]	EU Health[10]
pH	6-9	-	6.5-8.5
Temperature, oC	-	-	-
Turbidity, NTU	2.6	5	-
Dissolved oxygen, mq/l O2		-	
TDS, mq/l	<1000	-	500
Nitrates, mq/l NO3-N	45	50	50
Nitrites, mq/l NO2-N	5	3	0.50
Ammonium, mq/l NH4-N	-	1.5	0.2
Phosphates, mq/l PO4-P	3.5		1
Chlorides, mq/l	350	250	350
Sulphates, mq/l SO4-S	500	250	250
BOD, mq/l		-	100
COD, mq/l		-	10
Free cyanides, mq/l			0.05
Total cyanides, mq/l			0.05
WAD cyanides #, mq/l			

8 AZS 929:2023. Drinking water. Hygiene requirements and quality control.

9 WHO's Guidelines for Drinking-water Quality, Geneva, 1993

10 European Union Drinking Water Standards. Council Directive 98/83/EC on the quality of water intended for human consumption. Nov 1998.

Parameter	Azerbaijan (drinking water)[8]	WHO, drinking water[9]	EU Health[10]
Hardness, mq/l CaCO3	>30	-	180
Calcium, mq/l	250	-	130
Magnesium, mq/l	50	-	30.
Potassium, mq/l	-	-	200
Aluminium, mq/l	-	0.2	0.2
Arsenic, As, mq/l	0.3	0.05	0.01
Copper, mq/l	1	1	2.0
Cadmium, mq/l	0.001	0.003	0.005
Chrome, mq/l	-	0.05	0.05
Iron, mq/l	0.3	0.3	0.2
Manganese, mq/l	0.1(0.5)	0.1	0.05
Mercury, mq/l	0.0005	0.006	0.001
Lead, mq/l	0.03	0.01	0.01
Zinc, mq/l	5	3	5
Nickel, mq/l	0.1	0.02	0.02
Oil, mq/l	0.05	-	100
Faecal coliforms #/100 ml	0	0	0
Total coliforms #, per 100 ml	0	0	0

3.14.2. Air quality

International ambient air quality standards were established by the World Health Organization (WHO). There are also standards in force in Azerbaijan (Table 3.11).

Table 3.11. Air quality standards

Parameter	Averaging period	IFC (WHO) standards µg/m3	EU Directive 2008/50/EC11 µg/m3	Azerbaijan MAC12 µg/m3
Solids – PM10	1 hour	-	-	300
	24 hours	4513	50	-
	Annual	1514	40	-
Solids – PM2.5	24 hours	25	25	-
	Annual	10	10	-
Arsenic	One time	-		30
	24 hours	-		3
	Annual		0.006	
Nitrogen dioxide (NO2)	1 hour	200	200	-
	24 hours	25	25	25
	Annual	10	10	10
Sulphur dioxide (SO2)	1 hour			-
	24 hours	40	40	125
	Annual	-	-	-
	1 hour	30,000	-	-

11 EU Directive 2008/50/EC
12 GOST 17.2.3.02-78 “Təbiəti mühafizə. Atmosfer. Sənaye müəssisələrindən atmosferə atılan zərərli maddələrin yol virilən həddləri”. GOST 17.2.3.01 - 77 “Yaşayış Stationlərində havanın keyfiyyətinə nəzarət qaydaları”(GOST 17.2.3.02-78 “Nature protection. Atmosphere. Permissible limits of harmful substances released into the atmosphere from industrial enterprises. GOST 17.2.3.01 - 77 "Rules of air quality control in residential areas")
13 World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile. Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.
14 These standards are not included in the WHO Air Quality Guidelines Global Update 2005 but can be found in the WHO Air Quality Guidelines for Europe (WHO, 2000).

Parameter	Averaging period	IFC (WHO) standards µg/m3	EU Directive 2008/50/EC11 µg/m3	Azerbaijan MAC12 µg/m3
Carbon monoxide (CO)	24 hour	4	10,000	-
	Annual	-	-	-

3.14.3. Noise and vibration

Noise and vibration standards of the Project will be based on the "Norms of vibration and noise pollution, which have negative impact on the environment and human health" accepted in Azerbaijan[15]. Detailed breakdown of the limits is shown in Table 3.12 below.

Table 3.12. Maximum allowable noise levels in residential and public buildings, as well as other places of concentration in Azerbaijan

Object	Noise standards (max.), dBA	
	Daylight (07:00-23:00)	Night (23:00-7:00)
Residential areas	40	30
Commercial areas	55-60	55-60
Hotels and shared households	45	35
Industrial areas		
High-specialization facilities	50	50
Equipment locations or permanent work places inside buildings	80	80
Work places drivers and maintenance of trucks	70	70
Work places for drivers and maintenance of tractors and other similar agricultural / irrigation mechanisms	80	80

[15] Decree of the President of the Republic of Azerbaijan No. 796 of July 8, 2008 on approval of "Norms of vibration and noise pollution adversely affecting the environment and human health". http://www.e-qanun.az/framework/15124#_edn1

Object	Noise standards (max.), dBA	
	Daylight (07:00-23:00)	Night (23:00-7:00)
Vulnerable areas		
Hospitals and sanatoriums	35	25
Schools, libraries and conference halls	40	40

Measurements will be made at noise receptors located outside the project facilities. It should be noted that the national noise limits given in Table 3.12 are intended for maximum instantaneous noise effects. Therefore, adjustment limits should only be used to assess the sound impact of an instantaneous noise such as an explosion. As these limits do not cover the mean day and night noise levels, it is considered appropriate to assess the impact of night and day noise in accordance with the IFC HSE Guidelines.

IFC Environmental Health and Safety Guidelines; General HSE guidelines

The International Finance Corporation (IFC) has developed General EHS Guidelines for Noise (Table 3.13). They refer to noise from facilities and fixed noise sources and are commonly used as design standards for industrial facilities. Although the document provides general guidelines on noise effects, the IFC noted that they were not directly related to transport or mobile noise sources.

Table 3.13. IFC Noise Guidelines

Receptor	Maximum allowable noise levels, LAeq,1Time, dBA, free area	
	Daylight 07:00-22:00	Night 22:00-7:00
Residential, administrative and education buildings	55	45

Therefore, 55 dB (A) and 45 dB (A) absolute noise levels will be accepted by the Project as compliance criteria for both day and night periods.

Noise at workplaces

WBG EHS Guidelines for noise[16] provide a summary of noise exposure standards for employees (Table 3.14). These standards will be accepted as the Project standards.

Table 3.14. Allowable noise levels at workplaces

Location/work type	Equivalent level, LAeq,	Maximum level, LAmax, ani
Heavy production (crushing line, open pit and mechanized areas, stationary devices and mobile equipment)	85 dBA	110 dBA
Light production (limited number of stationary devices and mobile equipment in a limited area)	50-65 dBA	110 dBA
Open offices, control rooms, service stations or similar	45- 50 dBA	-
Individual offices (no annoying noise)	40-45 dBA	-
Classrooms, auditoriums	35-40 dBA	
Hospitals	30-35 dBA	40 dBA

Vibration

Due to the remoteness of the project area and its facilities from the residential areas and other and facilities, vibration impacts on the environment and the population have not been considered.

Vibration at workplaces

Allowable limits of the effects of vibration on workers' hands were set by the American State Conference on Industrial Hygiene (ACGIH), as well as the EU Directive on the Permissible Impact of Vibration on the Human Body17. The allowable limits are presented in Table 3.15 below.

16 IFC. Environmental, Health, and Safety (EHS) Guidelines. GENERAL EHS GUIDELINES: OCCUPATIONAL HEALTH AND SAFETY

17 Directive of the European Parliament and the Council of the EU 2002/44 / EU dated 25 June 2002 on minimum requirements for safety and protection of health of workers from risks associated with the action of physical factors (vibration).

Table 3.15. Comparison of ACGIH limit values (TLVs) for hand vibration exposure in X, Y or Z direction and daily exposure in EU Directive 2002/44/EC

Total daily impact duration (hours) ACGIH	Maximum velocity level measured from any direction (m/s2).
4-8 hours	4
2-4 hours	6
1-2 hours	8
Less than 1 hour	12
Daily impact (AB Directive - 2002/44/EC)	The maximum value of acceleration measured with frequency in any direction (m/s2)
8-hour value of the daily impact	5
Daily exposure limit	2.5

There is no direct comparison between these two sets of instructions. This is because ACGIH has values that depend on the duration of exposure and is based on any single axis greater than 4 m/s2. The EU has set a daily exposure limit of 5 m/s2 as the vector sum of the three axes and is based on an 8-hour exposure time. There is no significant difference in the standard of the two guidelines, so the Project will use the EU's Daily Impact Limit as it has multidisciplinary compliance criteria.

All body vibrations defined as ACGIH limits are defined by Z and XY vector graphs; ACGIH also refers to the EU Impact Limit of 0.5 m/s2 activity level. The EU Directive (2002/44 / EC) uses limits in any of the three axes and the Project will use EU Impact Limits as a criterion for compliance (Table 3.16).

Table 3.16. EU Vibration Directive (2002/44/EC): Impact limits

Type	Daily activity exposure limit (m/s2)	Daily exposure limit (m/s2)
All body vibration	0.5	1.15

3.14.4. Soils and land use

Maximum allowable soil contamination in Azerbaijan are determined by the MACs of harmful substances in the soil. Table 3.17 below presents the MACs accepted in Azerbaijan, as well as internationally accepted MACs of the following agencies:

- UK common assessment criteria guidelines;
- USEPA Guidelines for Comprehensive Regional Level Assessment. The assessment of permissible limits in this document is based on an analysis of risk factors throughout human life.

Reference values for the soil concentrations of potential contaminants

MACs accepted in Azerbaijan and the background values were used to assess the content of potential contaminants. For comparative purposes, the concentrations were also compared with the UK General Assessment Criteria Guidelines. The Guidelines are in line with EU directives and are constantly updated. They provide values for specific groups that differ in their methods of impact, and therefore provide a more informative assessment than the MACs accepted in Azerbaijan.

Table 3.17. Allowable concentration levels of potential soil contaminants (ppm)

Parameter	Azerbaijan MAC	Technical Guidelines for Contaminated Soil Impact Assessment (UK)	
		Gardens	Residential lands
Copper (Cu)	500	520	2400
	3	-	-
Lead (Pb)	32	80	200
	6	-	-
Zinc (Zn)	500	620	3700
	50	-	-
Arsenic (As)	2	43	37
Manganese (Mn)	1500	-	-
Cadmium (Cd)	0.5	1.9	11
Vanadium (V)	150	91	410
Mercury (Hg)	2.1	21	1.2
Fluoride (F)	2.8	-	-
Nickel (Ni)	30	53	130
	4	-	-
Boron (B)	-	45	290

Parameter	Azerbaijan MAC	Technical Guidelines for Contaminated Soil Impact Assessment (UK)	
		Gardens	Residential lands
Berillium (Be)	-	35	1.7
Cobalt (Co)	5.0	-	-
Chrome	6.0	15300	627
	0.05	1.8	6
Iron (Fe)	-	-	-
Molibdenum (Mo)	-	-	670*
Selenium (Se)	-	88	250
Hydrocarbons	500	1200	1600

3.14.5. Ionizing radiation

The Law of the Azerbaijan Republic "On Radiation Safety of the Population" (December 30, 1997) regulates the issues of ensuring radiation safety of the population to protect human health from the harmful effects of ionizing radiation.

To compare radiation doses, current ESIA uses internationally accepted criteria presented in the IFC EHS Guidelines (2007)18. Permissible effective doses of radiation hazards for workplaces are based on the IFC criteria (2007) and the norms of the British Agency for Public Health.

The criterion for the maximum effective annual allowable radiation dose for employees is 20 mSv per year, and for cadets aged 16-18 years - 6 mSv per year.

The limit of the population's exposure to radiation-causing activities is 1 mSv per year. According to the UK legislation and recommendations of the International Radiological Protection Commission, the limit of the population's exposure is set as 300 µSv (0.3 mSv) per year, when exposed to ionizing radiation from single object/source.

Recommendations on personnel's radiation protection developed by the International Radiological Protection Commission are taken into account in the basic safety standards of the IAEA.

18 IFC Environmental, Health, and Safety (EHS) Guidelines GENERAL EHS GUIDELINES

Table 3.18 presents the IFC criteria for maximum radiation exposure. Maximum exposure limits of the EU and IFC will be used as eligibility criteria for the Project.

Table 3.18. Maximum effective radiation doses allowed for workplaces

Duration	Workers above 19 years old	Students and probationers (16-18 years old)
5 years of continuous effective doze	20 mS/year	
1 year of continuous effective doze	50 mS/year	6 mS/year
Impact on eyes	150 mS/year	50 mS/year
Impacts on extremities and skin	500 mS/year	150 mS/year

3.14.6. Waste management

International Good Practices / Solid Waste Utilization Guidelines for Lenders

International best practices in solid waste management are reflected in IFC EHS guidelines and the policies of the EBRD. The IFC EHS are technical guidelines that provide examples of both general and industry-specific best practice.

Guidelines of IFC regarding management of hazardous materials and waste are given in Sections 1.5 and 1.6 of the general document19. The IFC EHS Guidelines also include additional methodological guidance for waste recycling facilities and mines.

The IFC EHS Guidelines provide international waste management practices for the industries as a consistent strategy for waste prevention, reduction, reuse, recovery and recycling. In this strategy, non-hazardous wastes that have been approved and listed should be collected, processed or disposed of at the facility. The provided examples include composting of non-hazardous organic wastes, construction of appropriately designed and licenced landfills or incinerators, as well as the use of other known reliable waste disposal methods, such as biodegradation. On the other hand, social and environmental policies of EBRD require that wherever waste cannot be recycled or reused, the customers must process or dispose of it in an environmentally friendly manner.

Best International Industrial Practice for Solid Waste Management

19 IFC Environmental, Health, and Safety (EHS) Guidelines GENERAL EHS GUIDELINES

It is required to organize transportation and disposal of the industrial and other wastes. Other waste types include construction, household and hazardous wastes. The waste should be classified according to specific treatment needs, and special strategies should be developed for waste collection and disposal.

Detailed Waste Management Plan will be developed for the Project. The following is an overview of the Project's waste management concept. When managing waste, an enterprise should strive to:

- reduce volumes of the wastes generated from its' sources;
- maximize waste reuse and recycling;
- practice safe handling of non-reusable or non-recyclable waste.

These targets can be achieved with the help of:

- Inclusion of concrete technical requirements in the Project design before the beginning of the construction works;
- Inclusion of waste management requirements in the equipment specification;
- reuse / recycling of excess materials and wastes;
- proper storage and utilization of wastes;
- administrative control over the implementation of waste management programs.

Waste flow identification

The waste management plan must cover waste streams that may arise during the construction and operation phases of the AZURE Project. Examples of waste streams:

- construction waste (inert waste such as plastic, glass, building materials);
- household and hazardous waste;
- Waste generated on the energy production and transmission facilities:
- wood, ferrous and non-ferrous metal; general non-hazardous waste, food waste, plastics, dry paint cans
- hazardous waste (oily waste), cargo residues, paper and cardboard, tires
- Waste paint (hazardous). This includes paints, varnishes, all types of industrial coatings and surface protection materials, including oil- and water-based paints, waste solvents, wood preservatives and their containers (empty and dry paint containers are not considered paint waste) and paint.
- Methods for managing each waste stream are typically described in the Project's Waste Management Plan.

4. ESIA METHODOLOGY

4.1. Introduction

Considering the requirements and risk categorizations under World Bank's Environmental and Social Framework (ESF), OHL construction projects typically fall under substantial. This categorization indicates that these projects may have potential adverse environmental and social impacts that are site-specific, largely reversible, and readily addressed through mitigation measures.

The WB ESS1 requires inclusion of the following specific elements in the ESIA methodology:

- **Scoping:** Clearly defining the boundaries of the assessment and identifying the key issues to be addressed.
- **Baseline Data Collection**: Gathering relevant environmental and social baseline data.
- **Impact Identification and Assessment**: Identifying and assessing the potential positive and negative environmental and social impacts of the project.
- **Mitigation and Management Measures**: Developing and proposing feasible mitigation measures to avoid, minimize, or compensate for adverse impacts.
- **Environmental and Social Management Plan (ESMP):** Preparing an ESMP detailing the mitigation and management measures, monitoring plans, and institutional arrangements for implementation.
- **Stakeholder Engagement Plan:** Outlining the process for meaningful consultation and participation of affected communities and other stakeholders.
- **Disclosure**: Making the ESIA report and other relevant documents publicly available.
- **Review and Approval**: Ensuring independent review and approval of the ESIA by relevant authorities.
- **Monitoring and Evaluation**: Implementing monitoring and evaluation programs to track the project's environmental and social performance and ensure compliance with the ESMP.

4.2. Scoping

In order to determine the initial physical and biological state of AoI, a variety of primary and secondary data were gathered and examined for the ESIA study, in conformance to ESS10 B, and SEP engagement methods through community meetings, online interviews with the village and town executive representatives and municipalities, focus group discussions with the stakeholders in all affected communities, filed visits to collect information on sensitive receptors, public consultations on ESF documents to include the views of and encourage participation by vulnerable groups. This included site visits and the execution of several specific studies, such as those on water quality, riverine and terrestrial biodiversity, soil quality, and socioeconomic baseline. The latter involved discussions with a range of pertinent organizations, such as government authorities, local municipalities (through interviews) and community members (through focus group consultations). The planned further work includes ESIA disclosure within the first decade of November.

The primary purpose of scoping is to determine the framework for carrying out the ESIA. The scoping process consists of the following stages:

- identification and initial coverage of the regulative framework applicable for the Project and the ESIA studies
- collection and initial analysis of data available on the project components and their implementation area,
- identification of the Project Are of Influence (AoI)
- definition of major potential impacts and management approaches
- identification of data gaps
- development of a roadmap and a plan for the detailed baseline studies and impact assessment.

The scoping is a collaborative process involving all key Project team categories, including planning, design, ESIA and stakeholder engagement. The scoping studies undertaken as part of the present ESIA consisted of the following main milestones:

- Collection of all available data on the AZURE Project, including location and design of the proposed facilities, construction plans and timeframes, required resources (labour, material and equipment) and future operation plans
- Identification and mapping of AoI of the proposed project activities
- Reviewing the relevant legislative and regulatory framework applicable to the Project
- Screening of environmental and social baseline of the Impact area
- Initial identification and assessment of major potential impacts (both positive and negative)
- Analysis of data gaps, identification of additional data requirements of the ESBS and ESIA studies
- Initial stakeholder studies, development of a roadmap for the further consultations.

4.3. Limitations to the ESIA

This ESIA to date has relied predominantly on desktop studies and data from third parties, along with some limited fieldwork to collect data on aspects such as water quality and traffic volumes for select areas. It is recognized that further field studies are required, which will include targeted stakeholder engagement with local authorities and PAPs in particular; and additional environmental studies, especially covering sensitive locations.

4.4. Project Description

A proper understanding of the project is essential to assess potential environmental impacts, and to identify project alternatives and impact mitigation measures. Failure to obtain a comprehensive project description

usually results in an incomplete ESIA study. The ESIA has analysed the project components and has evaluated the potential environmental and social impacts accordingly.

During the ESIA, discussions were held with Azerenerji to obtain information on the project and its design elements.

4.5. Discussion of Alternatives

The Project has developed a framework methodology for the review of alternatives. This framework has been developed to illustrate the design process being applied and the stages at which alternatives have been or could be considered. There are three stages at which alternatives have been considered: strategic alternatives (following 'Power System Level' studies); corridor and node alternatives (following 'Desk Study Level' studies on technical, environmental and social aspects) and finally route optimisation alternatives (at the 'ESIA and Technical Studies Level'). So far works have been completed for the establishment of the 'Strategic Alternatives' and is nearing completion for the 'Node and Corridor Alternatives.' As the ESIA progresses over the coming months and once corridors have been selected the results of ESIA studies will be fed into the route designs to optimise for technical, environmental and social aspects.

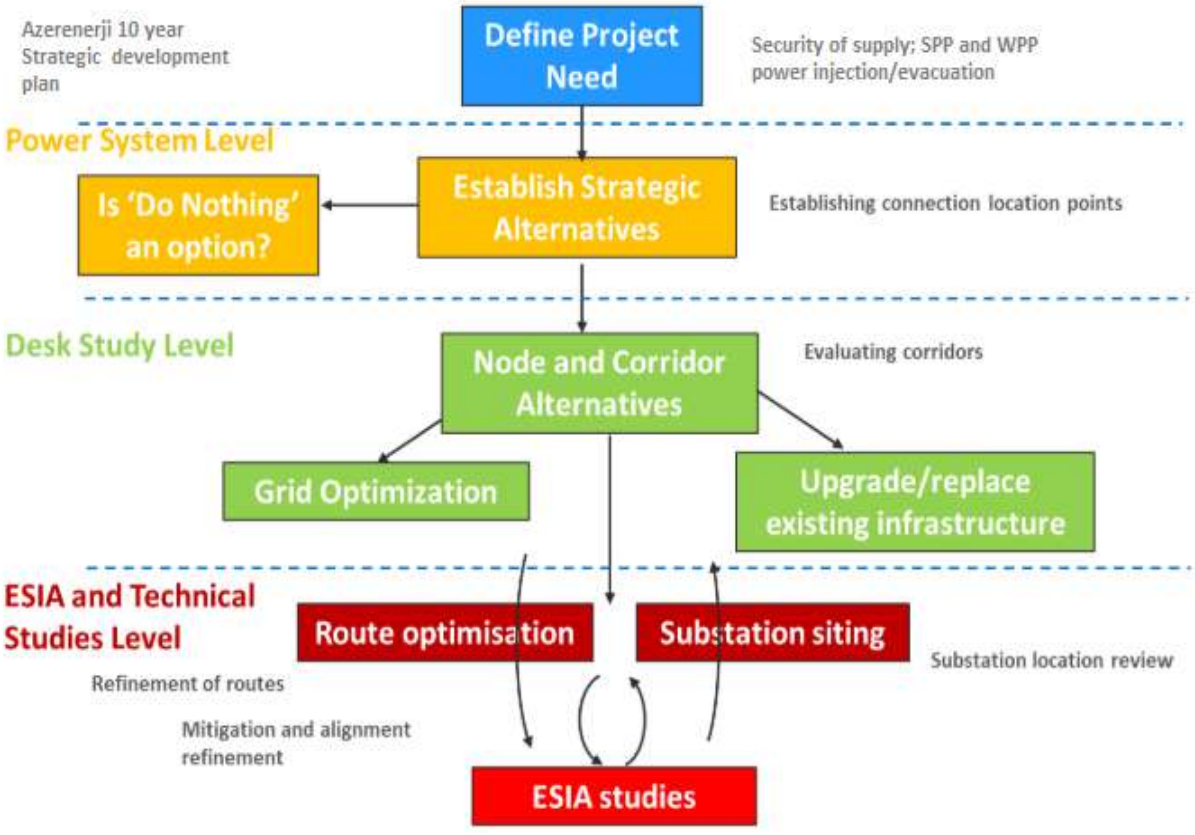


Figure 4.1: Framework methodology for review of project alternatives

4.6. Baseline Studies

The environmental and socioeconomic baseline studies were implemented through the collection and analysis of data from relevant primary and secondary sources, fieldwork, laboratory tests, interviews and focus group consultations. Details and findings of the baseline studies are presented in Chapters 6 and 7.

4.6.1. Identification of Project Impact Area

The AZURE project will have a widespread geographical impact across the country. AoI comprises a generally narrow strip extending across 11 administrative districts of Azerbaijan, namely Gobustan, Garadagh, Absheron, Hajigabul, Aghsu, Shamakhi, Ismayilli, Goychay, Aghdash and Yevlakh districts, and Mingachevir town. Some of the project area is found in the area between Neftchala and Hajigabul districts, along the M60, Baku-Gazakh Road, and along the E119 Baku-Alat-Astara road. In several locations, the AoI includes water courses and slopes of Kur and other major rivers of the country. Additionally, some parts of the AoI are located close to the protected nature territories, i.e. Turyanchay State Nature Reserve and Shirvan National Park.

When identifying the AoI of the studied project components, the following components were taken as a basis:

- Corridors and 200 m wide buffer zones for each OHLs;
- Territories and 500 m wide buffer zones of power plants and substations.

More detailed information on the AoI and affected settlements, nature areas and other AoI components is presented in Chapters 6 and 7.

4.6.2. Geographic Information Systems

Geographic information systems (GIS) were used as a special analysis and presentation tool during the ESIA studies. Before starting field investigations, a spatial analysis of satellite images was carried out, based on which the objects and areas to be taken into account in ecological and social studies were determined (e.g. borders of administrative-territorial units, corridors of transport infrastructure, hydrology, land use, state and private properties, natural habitats, mud volcanism, etc.). In addition, GIS was widely used during the on-site studies of environmental and socioeconomic baseline and project components. Within the ESIA framework, all spatial and digital data were collected in GIS, a cartographic database was created, the data was linked to the coordinate system, and as a result, thematic maps were compiled.

4.6.3. Study methodology

In order to determine the initial physical and biological state of AoI, a variety of primary and secondary data were gathered and examined in conformance to ESS10 B, applying SEP engagement methods including community meetings, focus group discussions, using the results of community feedback during the public consultations on ESF documents, online interviews with the village and town executive representatives and municipalities to include the views of and encourage participation by vulnerable groups. This included site

visits and the execution of several specific studies, such as those on water quality, riverine and terrestrial biodiversity, soil quality, and socioeconomic baseline . The latter involved discussions with a range of pertinent organizations, such as government authorities, local municipalities (through interviews) and community members (through focus group consultations).

The data obtained allowed the project team to better understand the complex interactions between various biotic and abiotic factors in AoI and characterize the pre-project baseline accordingly. Once the baseline conditions were established (see Chapters 6 and 7), it was used as a reference point to identify potential changes to the natural and social environment that may occur as a result of the proposed project activities, as well as to allow development of measures to prevent, mitigate or propagate these potential impacts.

4.6.3.1. Secondary data

To assist in assessing the pre-project environmental and social baseline of the Project AoI, a review of various ecological and socio-economic characteristics of AoI was conducted. The following activities were implemented as part of the secondary data collection:

- Collection of data from various government agencies, including the Meteorology Service of MENR, the Ministry of Digital Development and Transport, the executive authorities of the Project affected districts, Ministry of Energy, AzerEnerji, the institutes of the Ministry of Science and Education. The collected data covered such topics as the geological and hydrogeological, hydrological, meteorological characteristics and climate change, soil and land use, air, pollution, ecosystem services, etc.
- Analysis of the regulatory framework addressing the aspects of environmental quality, the use of soil and water resources, biodiversity conservation, etc.
- Study of socioeconomic characteristics of the affected districts and local communities.

4.6.3.2. Primary data, field studies

A key element of the comprehensive environmental baseline studies involved conducting regular site visits and implementing an on-site monitoring, sampling, and laboratory analysis program. Field studies and laboratory tests were performed by ISO-accredited IQLIM and “Caspian Environmental Laboratory”. The programs encompassed atmospheric air, noise and vibration, surface water resources, soils, terrestrial and river biodiversity, wastes, ecosystem services, and other environmental parameters of AoI. Program implementation spanned from July to August 2024, and over the Autumn 2024, and the results were integrated with secondary data analysis findings and presented in Chapter 6 of this report.

4.6.3.3. Geology

Geology of the Project AoI, including tectonic setting, geological structure, hydrogeology, seismicity, mud volcanism and natural hazards, was studied through the analysis of published literature sources and the reports developed within the framework of previous AoI affecting projects.

4.6.3.4. Soil quality, land use

The baseline soil quality within the Project AoI was determined through a comprehensive assessment that included a review of relevant published literature and previous survey results, along with a dedicated soil sampling program to analyse the soil quality. Additionally, satellite imagery analysis and on-site surveys were conducted to evaluate specific land use patterns.

When implementing the soil sampling activities, reference was made to the respective provisions of the following Azerbaijani and international standards:

1. AZS İSO 10381-1-2014 – Soil quality. Part 1. Sampling program development rules
2. AZS İSO 10381-2-2014 – Soil quality. Part 2. Technical recommendations for sampling activities
3. AZS İSO 10381-3-2014 – Soil quality. Part 3. Sampling program. Safety instructions
4. AZS İSO 10381-4-2014 – Soil quality. Part 4. Sampling program. Procedures for natural, seminatural and agricultural lands.

Depending on the condition of the soil, holes were dug to take soil samples at the designated monitoring stations using a hand auger. A measuring tape (m) was used to determine the depth of the holes dug by means of an auger. A plastic container and a ceramic spoon were used to collect and mix soil samples from the dug holes. Hand auger is a stainless-steel cylinder about 7 cm in diameter and 30 cm long, open at both ends, designed to move forward in a rotary motion with the bottom edge perpendicular to the earth's surface. The nose has a T-handle (fixed or manually operated) attached to the top of the cylinder by means of extendable stainless-steel rods.

In each of 8 sampling locations described in Chapter 6.5.2, soil samples were taken from 5 points, including 4 samples from corners and 1 from a center. The sampling depth was in the interval of 20-40 cm in each station. The sampled soils were collected in a plastic container, mixed into a single sample with a ceramic spoon and filled into a sample container - polyethylene bag labelled with data on the area, sample number and depth, sampling date and time, and sampling station coordinates.

Collected soil samples were sent to the laboratory at the day of collection. The samples were analyzed according to the parameters listed in Table 4.1 below.

Table 4.1. Analysed soil quality parameters

№	Parameters	Method
1	pH	ASTM D1293
2	Total Sulphate	HACH 8051
3	Nitrate	HACH 8171
4	Phosphate	HACH 8190
5	Ammonium	HACH 8155

№	Parameters	Method
6	Total Petroleum Hydrocarbons	GC-FID
7	Heavy metals: Ba, Cd, Cu, Pb, Zn, Co, Ni, Cr, As, Hg, Fe, Mn	ICP

4.6.3.5. Hydrology, surface water quality

Hydrological regime of the main rivers within the Project AoI, including catchment basins, gradients, flows, nourishment sources, flooding period and other parameters, were studied through the analysis of published literature sources.

The field studies included river water sampling and analysis carried out at major rivers and canals within the Project AoI. The studies consisted of measuring physical parameters, chemical composition and contamination levels (23 parameters) both onsite and in laboratory conditions.

When implementing the water sampling activities, reference was made to the respective provisions of the following Azerbaijan standards:

1. AZS 603.1-2011 – Collection rules of water samples from natural and artificial lakes
2. AZS 603.3-2011 - Collection rules of water samples from water flows.

Water sampling was carried out in accordance with sample collection standards and with special equipment and pre-made containers (samplers, flasks, bottles). To preserve representativeness of the collected samples, the sampling equipment was made from a chemically sustainable, resistant non-aggressive and sorbent material. In parallel with sampling, pH levels of the water samples were measured onsite.

Sample containers were pre-treated with appropriate chemical reagents (depending on the specified indicator), washed with distilled water and the water to be sampled. Containers intended for microbiological samples were sterilized.

5-liter containers were used during sampling at 10 surface (river) water sampling locations described in Chapter 6.6.3. These vessels were initially washed with running water taken for the analysis. Then, the water collected in 5-liter containers was filled into containers (bottles) designed for various analyses.

Collected water samples were sent to the laboratory at the day of collection. The samples were analyzed according to the parameters listed in Table 4.2 below.

Table 4.2. Analysed water quality parameters

№	Parameters	Method
1	pH	ASTM D1293

№	Parameters	Method
2	Sulphates	HACH 8051
3	Ammonia	HACH 8155
4	Phosphate	HACH 8190
5	Heavy metals: Ba, Cd, Cu, Pb, Zn, Co, Ni, V, Cr, As, Hg	ISO 11885
6	Total Petroleum Hydrocarbons	EPA 1664
7	BOD	SM 5210D
8	COD	HACH 8000

4.6.3.6. Meteorology and climate, climate change

Study of the climate, meteorological parameters and climate change implications of the Project AoI was implemented based on the analysis of literature data and covered the number of parameters, including solar radiation, air temperature and its' seasonal fluctuations, humidity, precipitation (rainfall and snow), wind regime and the sources contributing to the climate change process.

4.6.3.7. Air Quality, Noise, Vibration

Air quality is a term that describes how the atmosphere's condition compares to the needs of one or more living species or any human activities or goals. The study was focused on the air quality factors that could potentially affect human health or the environment, such as suspended particulate matter (PM10 and PM2.5 and larger particles, nuisance dust), nitrogen oxides (NOx) and sulfur dioxide (SO2). To evaluate the air quality, noise and vibration parameters of AoI, monitoring measurements were done in the selected project affected settlements, roads, agricultural lands and nature areas. The air quality monitoring methodology was selected based on the standards set by the Emissions Monitoring Guidance Note (AG2) issued by the Environmental Protection Agency (EPA) in May 2021. This guidance provides information on air emission monitoring at EPA-licensed sites. It outlines measurement durations and intervals applicable to natural conditions and low-concentration emission scenarios.

The air quality measurements were conducted following the below approach:

1. 1 hour of measurements in total during the daytime (07:00 am - 10:00 pm) with two 30-minute intervals. For example, 30 minutes of measurement at 9:00 am and 30 minutes of measurement at 3:00 pm.
2. 1 hour of measurements in total during the nighttime (10:00 pm - 07:00 am) with two 30-minute intervals. For example, 30 minutes of measurement at 11:00 pm and 30 minutes of measurement at 5:00 am.

The list of the measured air quality parameters is provided below:

1. Dust - as Particulate Matter PM2.5 and PM10
2. Gases – Nitrogen Dioxide (NO2), Sulphur Dioxide (SO2), Volatile Organic Compounds (VOC), H2S, Carbon Monoxide (CO).

Only daytime noise measurements were performed at 17 monitoring locations described in Chapter 6.8.3. Each measurement consisted of two sessions, each lasting 30 minutes, conducted in the 1st and 2nd halves of the daytime. The measurements were made using a digital sound meter to measure background noise levels as L_{eqA}, L_{90A}, L_{50A} and L_{10A}. The noise measurements identified factors that influenced potential receptors. The noise measurement protocols documented and categorized the main sources of noise based on their impact levels.

Air quality and noise monitoring results were obtained directly from the equipment used in the field and recorded in logs prepared by special monitoring software.

4.6.3.8. Waste studies

Study of the waste management practices within the Project AoI were conducted based on the data obtained from the sources below:

- National Waste Management Strategy (2017)
- Information provided by regional (district) and local authorities
- Calculation of domestic waste produced by local communities, based on the number of actual households.

4.6.3.9. Biodiversity studies

With time constraints taken into consideration, biodiversity studies relied upon the published literature, reports of the protected nature areas, as well as the past survey deliverables. The studies covered the following biodiversity parameters of the Project AoI:

- Flora complexes of Shirvan lowland, Ajinohur-Langabiz low-mountain area and Eastern Gobustan
- Animal kingdom of the lowland and mountainous parts of the Project AoI, including amphibians, reptiles, mammals and birds
- Ichthyofauna of Kur and its' left-bank tributaries
- Key Biodiversity Areas (KBA), bird migration routes, protected nature areas
- Endangered species spread in the habitats along OHL corridors.

As the desktop studies are not sufficient to provide a full and up-to-date picture of the Project AoI biodiversity, additional onsite seasonal studies will be carried out during the late preparation – early construction phases of the Project. Especially important in this regard are the studies of international bird migration routes, which were carried out during the 2024 fall migration and will be implemented for the 2025 spring migration. The first round of field ornithological studies was conducted in October-November 2024 to

clarify the geographic locations of the main migration corridors, to identify and count the actual numbers of migrating bird species, and to identify and assess sensitive areas within and in the proximity of the Project AoI. The study results have been integrated into the current ESIA report and the attached Biodiversity Management Plan.

The second round of ornithological surveys and sensitive habitat studies will be implemented in spring and summer of 2025 to ensure that the nesting and breeding seasons will be covered. Results of the additional surveys and the resulting recommendations will be integrated into the respective parts of this ESIA, which will be updated as a living document.

Implementation of onsite biodiversity studies is further detailed in the respective part of Chapter 6. "Environmental Baseline" and Chapter 9. "Impact Assessment" and elaborated in the Biodiversity Management Plan (Annex 6).

4.6.3.10. Landscape visual perception

Characterization of the AoI's landscape visual perception was implemented based on the guidelines developed by the UK Landscape Institute[20]. As part of the studies, physical condition and aesthetical value of the pre-project landscapes along OHL corridors and around power generation and transmission facilities of the Project were characterized through visual observations and as part of the consultations with local stakeholders.

During the studies, attention was focused on landscapes with the following characteristics:

1. Places with charming panoramas;
2. Natural and cultural landscapes, distinguished by their originality and beauty;
3. Landscapes with monuments of historical, cultural, and religious value;
4. Landscapes with tourist and recreational potential.

4.6.3.11. Ecosystem services

Ecosystem services stand for the benefits gained by the humans from the natural environment and the properly functioning ecosystems. The ESF defines ecosystem services as the benefits that people obtain from ecosystems"21, and this definition fully corresponds to the one proposed by the Millennium Ecosystem Assessment (MEA) Program.

During the ecosystem service studies in the Project AoI, the whole range of provisional, regulating, cultural and supporting services were investigated on matter of their presence and importance within and around the OHL corridors and power generation and transmission facilities. The studies also aimed at determining

[20] Guidelines for Landscape and Visual Impact Assessment. Second edition. Landscape Institute & Institute of Environmental Management and Assessment. Taylor and Francis e-Library, 2005

[21] Environmental and Social Framework (ESF) (worldbank.org)

the pre-project state of identified ecosystem services. Territories to be covered by ESA have been selected according to the following criteria:

1. Ecosystems in the territories of actual project implementation (physical area);
2. Scope and significance of rendered ecosystem services;
3. Geographical distribution of the users of identified ecosystem services (social impact area)
4. Service users (local, regional and global).

Taking into account the above criteria, the study was implemented in the actual Project AoI, mainly based on literature studies, spatial image analysis and limited onsite observations, implemented in parallel to the other field investigation works.

4.6.3.12. Socioeconomic Baseline Studies

Focus group discussions were held in 34 villages through clustering in the regions of Hajigabul, Shamakhi, Agsu, Agdash, Goychay, Ismayilli, Yevlakh and Mingachevir town from September 30-October 2, 2024. The purpose of the discussions was informing the stakeholders on ESIA preparation, the potential social and environmental impacts, and mitigation measures and receive community feedback. People's perceptions of the project, its benefits and risks were collected through specific pre-prepared focus group consultation questionnaires.

Furthermore, Public Consultations in the Project traversed regions of Hajigabul, Shamakhi, Agsu, Agdash, Goychay, Ismayilli, Yevlakh and Mingachevir town were conducted to disclose to the Project community the ESF Documents. People’s perception on the delivered information on possible risks and mitigation measures, impact assessment of social and environmental aspects as per national and WB ESF procedures have been received, concerns with reference to their past experience have been accordingly addressed. Minutes of all consultations are shown in public consultation section of the report.

IQLIM, together with AzerEnerji, conducted a detailed collection of baseline socio-economic data to determine the social and economic impact on people living in the Project AoI. Information, including census data, maps and reports, was collected from various sources. As part of the basic socioeconomic study, the following works were carried out:

- Collection of available information, data, maps and reports from AzerEnerji, government statistics, and local municipalities
- Interviews with EA representatives and local self-government leaders to obtain information, opinions and suggestions
- Focus group consultations with community representatives of the AoI settlements in all project affected communities
- Onsite surveys of historical and cultural heritage, study and summarization of the past survey and excavation results.

4.7. Stakeholder Consultations

Main purpose of the stakeholder consultation process consists in making stakeholders aware of the project's importance, giving careful consideration to the expressed stakeholder concerns, explaining transparently how these concerns will be addressed within the ESIA framework and, if necessary, making necessary improvements into a final Project design.

Consultations with project stakeholders is an extremely important component of the ESIA process. During consultations, it is necessary to provide stakeholders with the information on the Project's decision making process. To ensure that consultations are the integrous part of the decision-making process, they have to be implemented since the beginning of ESIA. Stakeholder consultations concentrate largely on:

- providing comprehendible information to a relevant audience on the planned project activities;
- providing feedback on key project related issues and concerns;
- selecting reliable sources of an accurate information;
- Identification of the potential impacts and suggestion of opportunities in response to the alternatives and objections proposed by the affected parties, including NGOs, local communities and other stakeholders.

Stakeholder engagement activities refer to both the national baseline requirements for EIA preparation and the WB ESF/ESS, as the project is being prepared and implemented under the WB ESF/ESS. Therefore, in case of any inconsistency, the World Bank ESF/ESS shall prevail.

Information-Sharing

Providing factual information to stakeholders early in the project planning process assists in the development and maintenance of constructive stakeholder relationships. To facilitate this process, during the consultation, stakeholders were presented with information about the Project which was then used as a starting point for discussion.

Consultation Methods and Materials

The following stakeholder consultation and engagement methods have been applied:

- Interviews with EA representatives to collect data on local socioeconomic baseline and identify vulnerable impact receptors;
- focus group consultations with AoI community members, including women and representatives of other vulnerable community subgroups. During these meetings, stakeholders were provided with a Project briefing and information was gathered from them through specific pre-prepared focus group consultation protocols.

Stakeholder Engagement Plan. A Stakeholder Engagement Plan has been developed separately for the AZURE Project (https://www.azerenerji.gov.az/azureproject). Chapter 8 covers stakeholder engagement activities during ESIA process including feedback and how it informed the ESIA, disclosure of ESIA and public

consultations, stakeholder engagement recommended as part of environmental and social monitoring of project implementation at the construction, operation, and decommissioning phases, and the grievance mechanism as a tool for monitoring and adaptive management of ESHS impacts of the project.

4.8. Impact Assessment

This section identifies and evaluates potential environmental, social (socio-economic), and public health impacts resulting from the proposed Project during site development & construction, operation and maintenance stages. The potential impacts are evaluated to assess possible consequences of the project activities to determine the severity and extent of identified potential impacts, and aid in the development of mitigation or enhancement measures to reduce or negate those identified potential impacts.

4.8.1. Identification of Potential Impacts

Identification of potential impacts is an objective exercise to determine what could potentially happen to the environment as a consequence of the Project and its associated activities. This effort builds on the identification step in scoping, whereby the potential interactions between the Project and the baseline environment are identified. From these interactions, the potential impacts to the various resources or receptors are identified and are described to the extent possible.

The nature and types of potential impacts addressed in this ESIA are defined in Table 4.3 below.

Table 4.3. Nature and types of impact related terms

Term	Definition
Indirect impacts	Secondary or higher order potential impacts resulting from the potential direct impacts of the project. These indirect potential impacts are often later in time or further removed in distance.
Cumulative impacts	The additive potential impacts that may result from the incremental potential impacts of the planned Project plus the potential impacts of reasonably anticipated future projects.
Receptors	The attribute of the environment (e.g., air, water, soil, sediment, etc.) or public, which may be potentially impacted by the project activities.
Impact duration	Classified as either short-term (potential impacts lasting less than 1 year), medium-term (potential

Term	Definition
	impacts lasting 1 to 10 years) or long-term (potential impacts lasting longer than 10 years).
Event related Impacts	Potential impacts stemming from a specific unintentional event - such as fire/explosion, etc.

4.8.2. Assessment of Potential Impacts

Potential Impact Characteristics

Once the identification of potential impacts is complete, each potential impact is described in terms of its various relevant characteristics (e.g., type, scale, duration and extent). The terminology and designations used to describe potential impact characteristics is shown in Table 4.4 below.

Table 4.4. Potential Impact Characteristics: Terminology

Characteristics	Definition	Designations
Type	A descriptor indicating the relationship of the potential impact to the Project.	Direct Indirect Cumulative
Extent	The "reach" of the potential impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc).	Local Regional National
Duration	The time period over which a resource / receptor is potentially affected	Short Term Medium Term Long Term
Scale	Concentration of an emission or discharge with respect to standards of applicable legislation and international guidance, potential to be damaged or impacted, the fraction of a resource that could potentially be lost or affected, etc.	Low Medium High

Likelihood

Within this impact assessment, potential impacts contingent upon the occurrence of a specific, unplanned event with a finite probability are categorized as "event-related impacts". An illustrative example relevant to this Project could involve an accidental, uncontrolled hydrocarbon release under non-routine operating conditions. Given the possibility that event-related impacts may not materialize, their assessment may incorporate an evaluation of likelihood. This likelihood assessment will not apply to all potential impacts, and those identified as "event-related" will be explicitly designated.

Likelihood determination will draw upon historical data, modeling, industry benchmarks, and expert judgment. Furthermore, it will factor in anticipated mitigation measures, engineering controls, and established procedures designed to prevent or mitigate the potential consequences of such events. Table 4.5 below provides a detailed description of the Likelihood categories employed in this assessment.

Table 4.5. Likelihood of Event-Related Impacts

Impact	Definition
Rare	The impact is rare or unheard of
Remote	The impact has occurred once or twice in the industry
Unlikely	The impact has occurred in the industry in the past but is not likely to occur on this project during the lifecycle of the facility (e.g. construction, operation, decommissioning).
Seldom	The impact could occur on this project during the lifecycle of the facility but only under exceptional conditions.
Occasional	The impact may occur on this project during the lifecycle of the facility.
Likely	The impact can reasonably be expected to occur on this project during the lifecycle of the facility.

Magnitude

After defining the characteristics of potential impacts, the subsequent step in the impact assessment process involves assigning a "magnitude" to each potential impact. Magnitude is typically determined by a combination of impact characteristics, such as extent, duration, scale, and, in the case of event-related impacts, likelihood. The specific combination of characteristics considered depends on the resource or receptor affected.

Magnitude describes the intensity of potential change to a resource or receptor resulting from the impact. While the magnitude designations remain consistent, their definitions vary based on the specific resource or receptor under consideration. These designations include:

- Positive
- Negligible
- Minor
- Moderate
- Major

For potential positive impacts, no magnitude designation other than "positive" is assigned. For the purposes of this ESIA, it suffices to indicate the potential for a positive impact without quantifying the precise degree of positive change.

Regarding potential impacts stemming from unplanned events, the same resource/receptor-specific approach is used to determine magnitude. However, the "likelihood" factor is considered alongside the other impact characteristics when assigning a magnitude designation.

Sensitivity/ vulnerability / Importance of impact receptors

Alongside characterizing the magnitude of a potential impact, the other key step in impact evaluation is defining the sensitivity, vulnerability, or importance of the potentially impacted resource or receptor. A variety of factors are considered in this determination, encompassing physical, biological, cultural aspects, and potential effects on vulnerable populations. Additional factors may also come into play, such as formal legal protection status, relevant government policies, stakeholder perspectives, and economic significance.

Similar to the magnitude assessment, while the sensitivity/vulnerability/importance designations remain consistent across evaluations, their specific definitions are tailored to each individual resource or receptor. For all resources and receptors examined in this assessment, the following designations will be employed:

- Low
- Moderate
- High

Potential Impact Significance Determination

Once the magnitude of a potential impact and the sensitivity/vulnerability/importance of the affected resource or receptor have been determined, the significance of each potential impact can be assigned. This is done using the matrix presented in Table 4.6, which guides the designation of potential impact significance based on the combination of magnitude and sensitivity/vulnerability/importance assessments.

Table 4.6. Potential Impact Significance

		Sensitivity/ Vulnerability/ Importance of Resource/ Receptor		
		Low	Medium	High
Magnitude of impact	Negligible	Incidental	Minor	Minor
	Small	Minor	Moderate	Major
	Medium	Moderate	Major	Severe
	Large	Major	Severe	Severe

Determination of Significance

This process will identify, assess, and evaluate potentially significant impacts, with a prioritization of those that require mitigation. The determination of impact significance relies on professional judgment, industry experience, and the knowledge of resource specialists, considering the local and regional/global context of the impacted resource. Applicable local regulations in Azerbaijan serve as the foundation for evaluating potential physical effects. In the absence of relevant local regulations, relevant international standards for energy sector operation are utilized, where available.

Furthermore, stakeholder considerations and industry norms are also factored into the determination of impact significance and mitigation prioritization.

Each potential impact is assessed based on specific information regarding the actions causing the impact, the affected receptor, available baseline data, the extent and duration of the potential impact, and other pertinent factors. Consideration is given to reasonable best practices, planned engineering controls, and anticipated mitigation measures. Based on this comprehensive information, the Environmental and Social Impact Assessment (ESIA) team determines the significance of each potential impact. The following tables provide high-level definitions for the potential impact significance designations for environmental (Table 2.7) and social (Table 2.8) impacts, respectively. It is important to note that potential impacts may arise directly from the proposed Project or indirectly and cumulatively.

Potential Environmental Impacts

The significance designations for potential environmental impacts are determined by considering the impact characteristics, any relevant additional criteria, receptor sensitivity, the duration and extent of the impact, and the ability of the potentially impacted receptor to recover to its pre-impact state.

Table 4.7. Significance of potential environmental impacts

Impact	Definition
Incidental	Potential impacts such as localized or short-term effects on habitat, species, or environmental receptor.
Minor	Potential impacts such as localized, long-term degradation of sensitive habitat or widespread, short-term impacts to habitat, species, or environmental receptor
Moderate	Potential impacts such as localized but irreversible habitat loss or widespread, long-term effects on habitat, species, or environmental receptor.
Major	Potential impacts such as significant, widespread, and persistent changes in habitat, species, or environmental receptor.
Severe	Potential impacts such as persistent reduction in ecosystem function on a landscape scale or significant disruption of a sensitive species.

Potential Social Impacts

Potential social impacts are inherently complex due to the variability of community responses, perceptions of current and evolving conditions, and the diverse degrees of vulnerability, all of which are heavily influenced by local context. The significance designations for potential social impacts are therefore determined by drawing upon social science expertise and previous experience in the country concerning the relationships among individuals, communities, government agencies, NGOs, special interest groups, and the energy industry.

Table 4.8. Significance of potential social impacts

Impact	Definition
Incidental	Potential impacts that are practically indistinguishable from the social baseline, with little to no potential impacts to or concerns from impacted external stakeholders.
Minor	Potential impacts that are inconvenient; potentially impacted external stakeholders concerned but likely able to adapt with relative ease.
Moderate	Potential impacts such as localized or short-term impacts; potentially impacted stakeholders concerned but likely able to adapt with relative ease.

Impact	Definition
Major	Potential impacts such as local-to-regional (sub-national) or medium-term impacts; potentially impacted stakeholders concerned and raise the issue as a high priority, but may be able to adapt with some targeted support or assistance.
Severe	Potential impacts such as local-to-national or long-term impacts; potentially impacted stakeholders concerned and raised as a high priority; may not be able to adapt without targeted support or assistance in order to maintain pre-impact livelihood.

Potential Public Health Impacts

To assess potential public health impacts, this evaluation considers the public who could be exposed to various aspects and impacts of the project, encompassing both permanent residents with continuous exposure and individuals with periodic exposure within the AoI. The determination of significance for potential public health impacts draws upon local and regional public health expertise, as well as previous experience in the country regarding the relationships among individuals, communities, healthcare providers, government agencies and AzerEnerji workers.

Table 4.9. Significance of potential health impacts

Impact	Definition
Incidental	No impact to the public
Minor	Potential illness or adverse effect with limited or no impacts on ability to function and medical treatment is limited or not necessary.
Moderate	Potential illness or adverse effects with mild to moderate functional impairment requiring medical treatment or management.
Major	Potential serious illness or severe adverse health effect requiring a high level of medical treatment or management.
Severe	Potential serious illness or chronic exposure of a few or more resulting in life shortening effects.

4.9. Impact Management and Monitoring

Upon characterizing significant negative potential impacts (moderate, major, and severe), the subsequent step involves developing mitigation, enhancement, and monitoring measures. The Mitigation Hierarchy prioritizes measures in the following sequence:

Avoid at source, reduce at source: This entails avoiding or reducing negative potential impacts through project design or engineering controls to prevent unplanned events.

Abate on site: Incorporate design elements to mitigate potential impacts (e.g., pollution control equipment).

Abate at receptor: If on-site abatement is not feasible, implement control measures off-site.

Repair/remedy: Address potential impacts involving unavoidable damage to resources (e.g., water quality, fishery) through repair, restoration, or reinstatement measures, if they occur.

Compensate/offset: If none of the above are practicable, compensate for potential project impacts by, for example, replacing the loss/damage at another location.

For positive potential impacts or project benefits, the ESIA team identifies opportunities to enhance these benefits.

In developing mitigation and enhancement measures, the following considerations apply:

- Assess the effectiveness of each potential mitigation measure and identify potential synergies.
- Determine the level of impact reduction or benefit enhancement resulting from each potential mitigation measure.
- Select preferred measures based on the aforementioned analysis.
- Review all mitigation and benefit enhancement alternatives to:
  - Identify potential conflicts or adverse cumulative effects.
  - Determine potential implications for other project parameters (e.g., safety, security, stakeholder relationships).
  - Identify potential synergies.

The plan also outlines monitoring activities during site development, construction, operation, and maintenance. This monitoring aims to provide data to assess:

- Actual project impacts against those evaluated in the Impact Assessment.
- The effectiveness of implemented mitigation and enhancement measures.

When developing mitigation, enhancement, and monitoring measures, the plan clearly distinguishes between:

- Measures to mitigate potential negative impacts from the project.
- Measures to address potential multi-factorial indirect effects.
- Measures to enhance potential positive project impacts.

4.10. Environmental and Social Management Plans

Mitigation and management measures are strategies implemented to avoid or reduce the potential negative environmental and socio-economic impacts associated with the Project to levels deemed not significant. This can be achieved through various means, including modifications to the proposed design, adjustments to construction methods, the application of specific controls, or changes to the Project's location. The objective of "reducing potential impacts to levels which are not considered significant" means mitigating these impacts to the point where they no longer pose a substantial threat to the current or future state of the surrounding natural environment, biodiversity value, or the social and economic environment of the region. In cases where specific local regulations are unavailable, international standards, guidelines, or generally accepted industry-specific best practices may be used to determine significant impact thresholds.

The Environmental and Social Management Plan (ESMP) developed for this Project aligns with international best practice principles and documentation, incorporating the following key elements:

- A comprehensive description of the Project activities.
- A breakdown of the scope and purpose of the ESMP.
- An outline of the framework for compliance and regulatory requirements, including the Mitigation Plan, Monitoring Plan, and Monitoring Indicators.
- Clear delineation of ESMP management responsibilities within the broader Project management structure.
- An overview of the auditing and review process.
- Detailed Environmental Implementation Budget and its funding source.
- Identification of environmental values and potential impacts, along with corresponding mitigation measures and individual responsibilities.

5. PROJECT ALTERNATIVES

5.1. "Zero Project" Scenario

If the Project is not implemented, this will hinder the objectives of the country's energy sector strategy and renewable energy transition goals. With this option, greater reliance will continue to be placed on generating power from fossil fuel sources. The achievement of the objectives of Azerbaijan's 2025 vision and beyond for the inclusion of renewable energy electricity within its generation mix would not be supported.

5.2. Location Alternatives

The Navahi substation is built within the boundaries of the site allocated to AzerEnerji during the Soviet period for the purpose of building a nuclear power plant. Several options have been considered for placing the substation, and the exact location was chosen taking into account that there is an informal settler's house within the boundaries of the site, thus, causing the need to observe a minimum safety distance of 30m.

The sites for the Banka and Bilasuvar SPPs and Absheron-Garadagh WPP have been allocated to Masdar by the Ministry of Energy on behalf of the Government of Azerbaijan from the state land fund allocated for development of solar and wind power development opportunities in Azerbaijan. The ESIAs for SPPs and WPP being prepared by Masdar discuss the process of site assessment and alternative site selection.

5.3. Reconstruction vs New Construction Alternatives

Investment Agreements signed between the GoA and Masdar Company envisage the implementation of 445 MW solar power plant in Bilasuvar region, 315 MW SPP in Banka settlement of Neftchala region and 240 MW WPP in Gobustan region. The existing 330 kV transmission lines in Neftchala and Bilasuvar regions were built 50 years ago and are currently at maximum load and not capable of receiving an additional 1000 MW of renewable power. Therefore, the reconstruction of the existing grid is not a feasible solution for the evacuation and transmission of energy to be generated at the new SPPs and WPP. Instead, it is important to build a new 500/330 kV "Navahi" substation and connect the solar and wind power stations to the power system via 500/330 kV connecting/evacuation lines.

6. ENVIRONMENTAL BASELINE

6.1. Introduction

Environmental baseline studies implemented in the Project AoI (hereinafter: EBS) constitute the biggest and most crucial part of the current ESIA. The Project EBS involved collection and quantitative analysis of the baseline (pre-project) environmental parameters of the AoI. Data produced through EBS were used to determine how the existing environmental parameters might change because of the actions to be taken during the future construction and operation of the Project facilities.

The EBS is an essential part of the ESIA process, as it helps to identify and distinguish the potential Project impacts. A well-executed EBS creates opportunities to reduce potential impacts that have high ratings in the early stages of the project implementation, thus avoiding more severe risks for the project.

The EBS deliverables can be applied as an early warning system for potential impacts. On the other hand, the accuracy of the environmental impact assessment process depends on how detailed the EBS will be. The implementation of EBS is a mandatory requirement for official approval of ESIAs developed for largescale energy production and transmission projects.

This chapter is dedicated to the description of the environmental baseline in the Project site and the Project's AoI (hereinafter – Study area). The baseline studies have been carried out in detail for the following components of the physical and biological environment of the Study area:

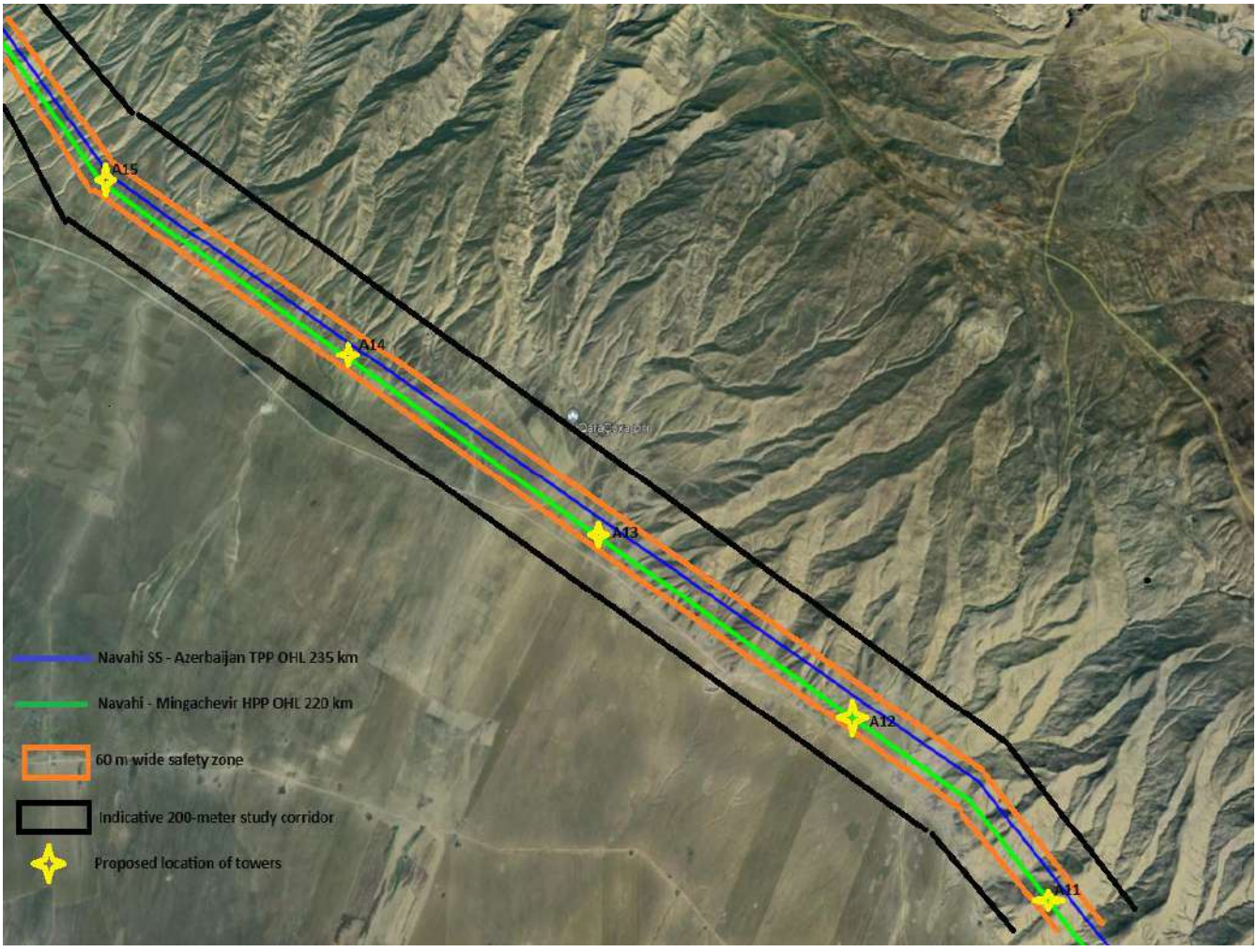
- Geology, hydrogeology, geomorphology, geological and exogenous hazards
- Meteorology and climate
- Hydrology and water quality
- Soil cover and land use
- Biological diversity, ecosystems, important biodiversity sites, protected nature areas
- Landscape and visual receptors
- Air quality, noise, and vibration
- Greenhouse gases
- Municipal wastes
- Ecosystem services

6.2. Briefing of Study Area

6.2.1. OHL Corridors

When defining the study area, conclusions and recommendations developed during Screening and Scoping phases of the AZURE Project implemented in April-May 2024 were referred to22. The scoping studies concluded that the 200-meter corridor along designed OHLs is sufficient to characterize conditions and assess impacts of the Project.

Although the final tower locations will not be identified until final design, the 200-meter corridor was selected in such a manner that relatively minor changes in tower locations from their indicative locations would not make significant differences in the results of the analysis. The study area along one section of the corridor is depicted in Figure 6.1. The outer lines show the 200-meter-wide corridor, the blue lines show the indicative 60-meter "safety zone" in which buildings will be prohibited, and the green and blue lines shows the indicative locations of the towers and transmission lines.



[22] Draft Environmental and Social Scoping Report of Azerbaijan Scaling-Up Renewable Energy Project. "Azerbaijan Scientific-Research and Design-Prospecting Energy Institute". Baku, June 2024

Figure 6.1: Typical Section of the 200-meter study corridor showing the 60-meter Safety Zone

With the above approach kept under consideration, the EBS area of the designed OHLs was set as a 200 m wide corridor of the OHLs listed below:

- 235 km long corridor of "Azerbaijan TPP - Navahi SS" single-circuit OHL;
- 65 km long corridor of "Absheron-Garadagh WPP - Navahi SS" single-circuit OHL;
- 22 km long corridor of "Alat FEZ SS - Navahi SS" double-circuit OHL;
- 19 km long corridor of "Absheron-Garadagh WPP - Gobu ES" single-circuit OHL.

A. "Azerbaijan TPP - Navahi SS" OHL. The longest and most significant component of the EBS area comprises the "Azerbaijan TPP - Navahi SS" corridor. These OHL having 235 km lenght traverse Mingachevir city, Yevlakh, Aghdash, Goychay, Ujar, Kurdamir and Hajigabul districts in Azerbaijan, passing near 33 settlements along the middle and lower Kur depression. The study area's elevation ranges from 140 meters above sea level (ASL) near Mingachevir HPP in the west to 19 meters ASL near Navahi SS in the east. The area primarily follows the northern edge of the Shirvan lowland, tracing the foothills of the Ajinohur, Khoshavend, Langabiz, and partially, Alat ranges. "Azerbaijan TPP - Navahi SS" OHL crosses the river beds of Turyanchay, Goychay, Girdimanchay and Aghsuchay – major rivers of the left-bank basin of Kur. Part of the corridor is located close to the southern border of Turyanchay State Nature Reserve.

B. "Absheron-Garadagh WPP - Navahi SS" OHL. The second longest segment of the study area comprises the corridor of north-south oriented "Absheron-Garadagh WPP - Navahi SS" OHL corridor. Running across sparsely populated semideserts of the Eastern and Southeastern Gobustan, the corridor crosses the structures of Chichaki and Alat ridges, and terminates the southeastern extension of the Shirvan lowland. The area's elevation ranges from 210 ASL near Aghnohur mud volcano in the middle of the corridor, to 18 meters ASL near Navahi SS in the south.

C. "Alat FEZ SS - Navahi SS" OHL. This part of the study area starts from the southern vicinity of Bahar mud volcano in the east and, following the southern foothill of Alat ridge ends at Navahi SS in the southeastern margin of the Shirvan lowland. The area's elevation ranges from 50 ASL in the centre at the foot of Alat ridge, to 5 meters BSL near Alat in the east.

D. "Absheron-Garadagh WPP - Gobu ES" OHL. This part of the study area is situated on Guzdak plateau in the Eastern Gobustan, extending for 19 km between Absheron-Garadagh WPP in the west and the northern outskirts of Gobu settlement in the east. The area's elevation within the range of 80-210 meters ASL. There are no settlements along the corridor.

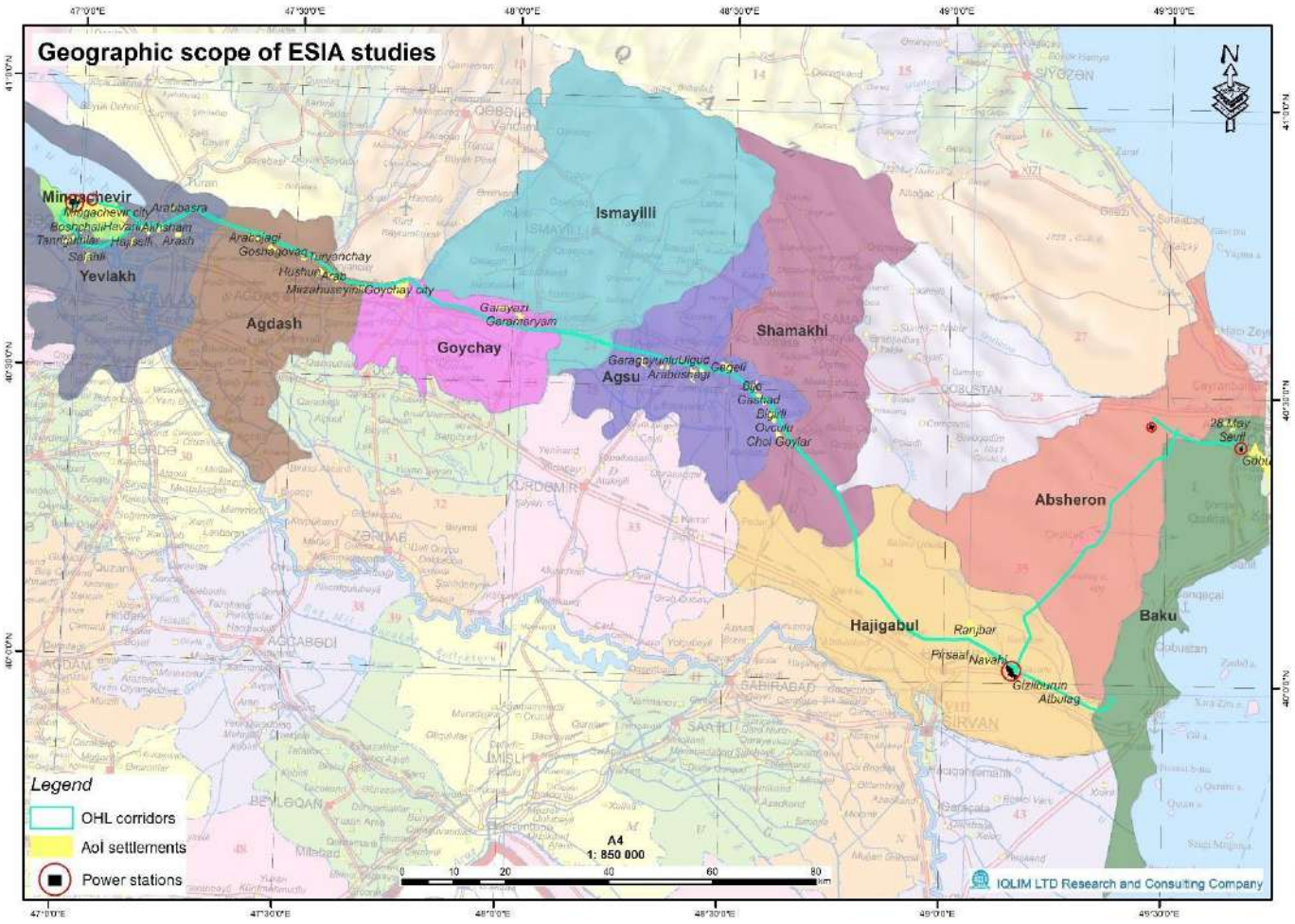


Figure 6.2: Map of the EBS coverage area: OHLs

6.2.2. Substations and Power Plants

Because of being located on the destinations of OPL corridors, areas around “Azerbaijan” TPP, “Gobustan” WPP, “Alat FEZ” SS, “Navahi” SS and “Gobu” ES constitute parts of a non-interrupted AoI and, respectively EBS coverage area. Study sites of the above facilities comprise the facilities themselves and 500 m wide buffer zones around them. Location maps of the study areas together with parts of OPL corridors are provided in the Figures below.

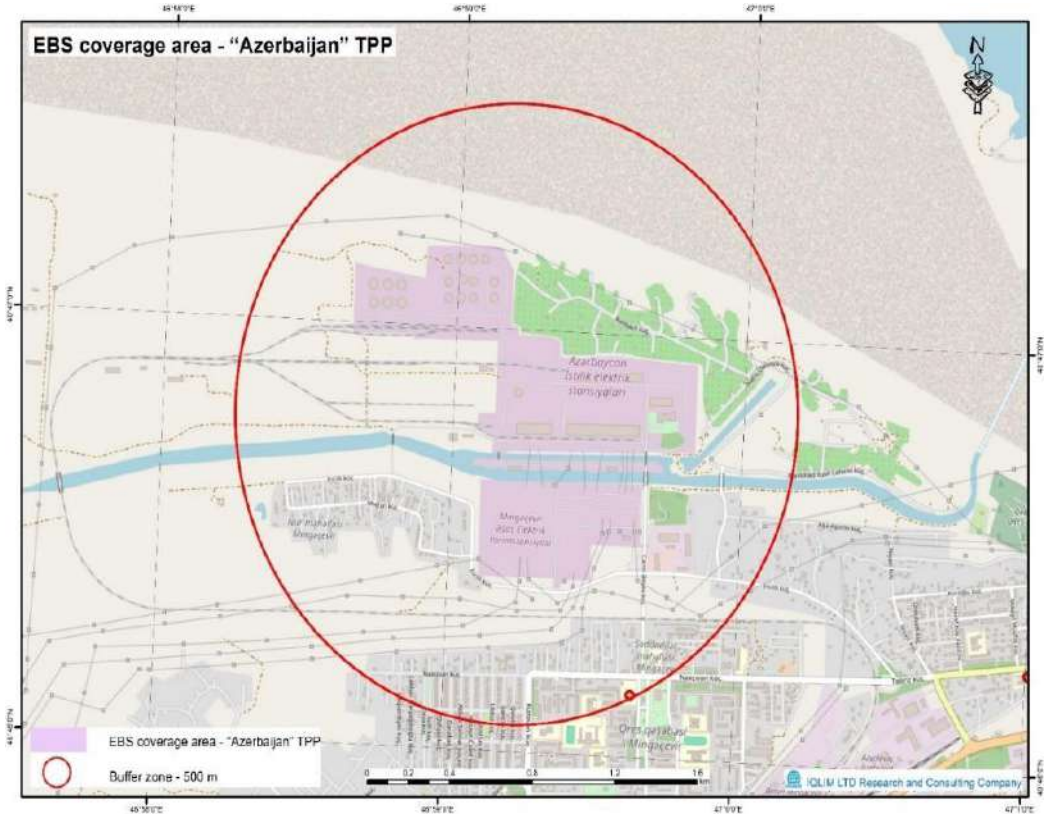


Figure 6.3: EBS coverage area - "Azerbaijan" TPP

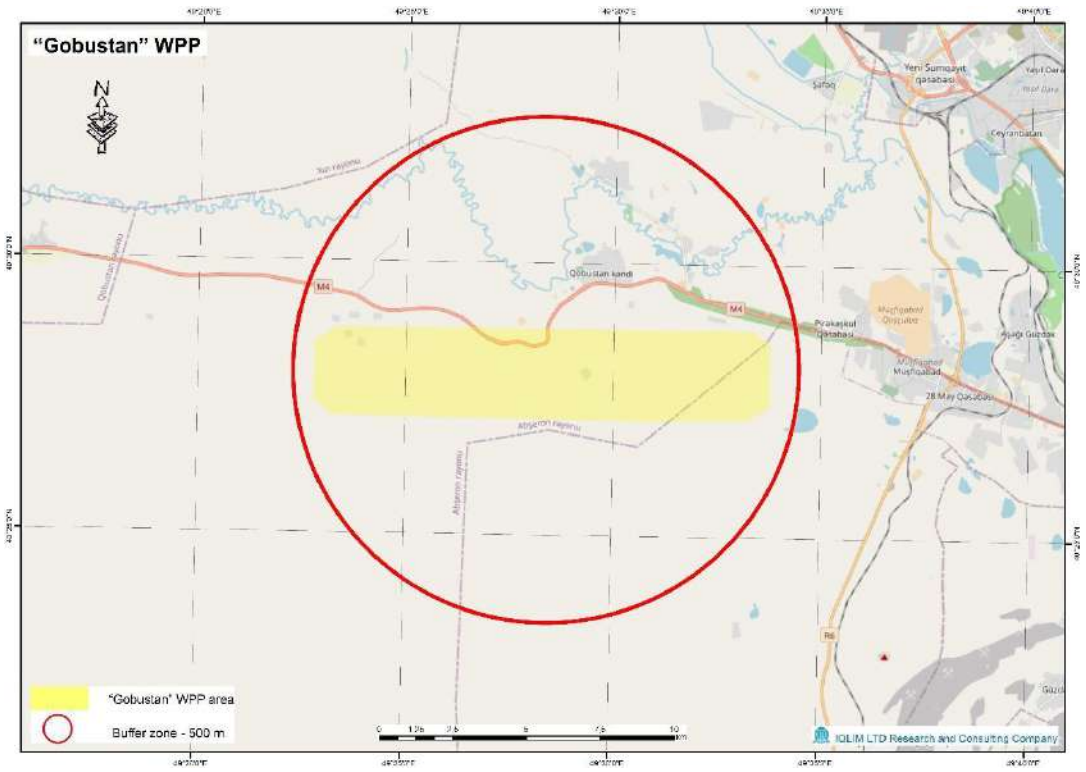


Figure 6.4: EBS coverage area – "Absheron-Garadagh" WPP

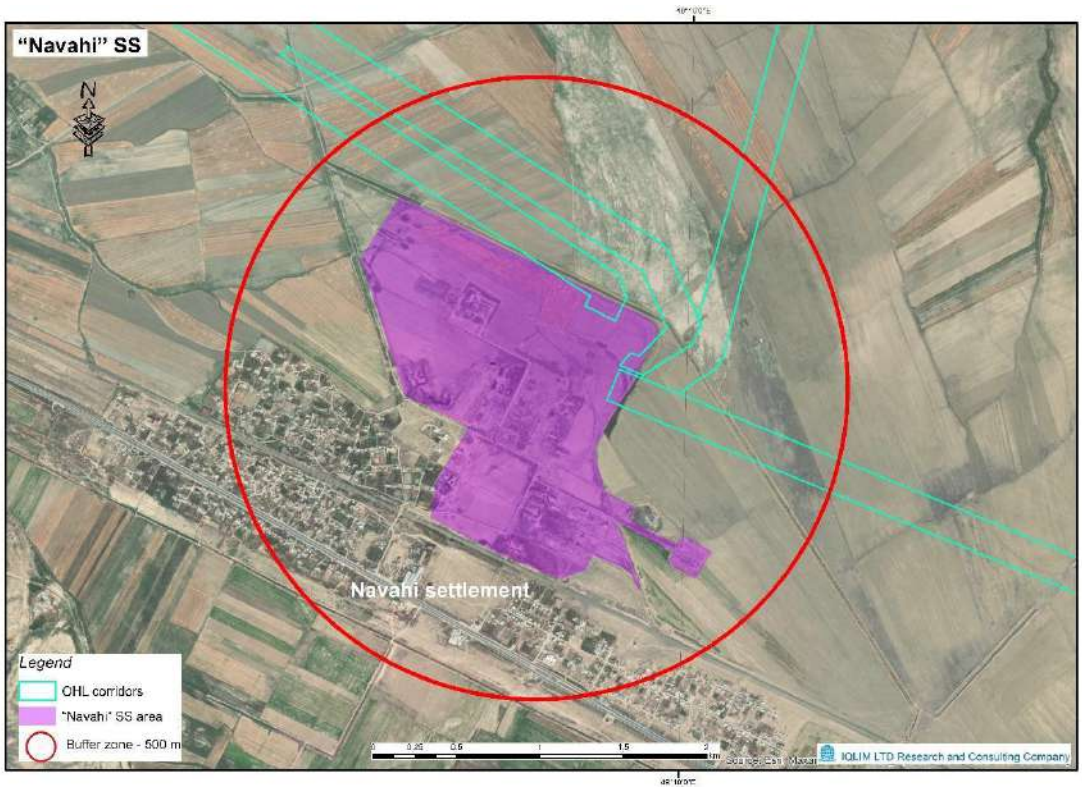


Figure 6.5: EBS coverage area – "Navahi" SS

6.3. Physiographic regioning

Due to the exceptional length of the OHL corridors, the Study area extends across several physical geographic regions of Azerbaijan. Thus, the greatest segment of "Azerbaijan TPP - Navahi SS" OHL corridor is confined to the bordering territories of the province of Kur intermontane depression from one side, and the Greater Caucasus province from the other. The remaining 3 OHL corridors run across the territory of Gobustan-Absheron physiographic province. Short geomorphological description of the Project affected physiographic regions distinguished within the structure of the above provinces is given below:

A. Ajinohur-Jeyranchol physiographic region. Being part of the province of Kur intermontane depression, the region covers 250 km long territory extending between the Georgian border in the northwest and river valley of Girdimanchay in the southeast. The region is bordered by Ganykh-Ayrichay valley in the north and Kur-Araz lowland in the south. The region represents a low-mountain area with true altitudes varying within the

range of 80-290 meters ASL23. Within the boundaries of the study area, the region is represented by the following structural elements:

- Ajinohur low-mountain zone characterized by low-altitude anticlinal ranges and ridges with gentle tectonic relief dissected by synclinal troughs and valleys. Major structural elements of the zone within the Study area are the Ajinohur range, Khoshavend range and Garamaryam ridges extending in sublatitudinal direction between Mingechevir reservoir in the west and the river valley of Girdimanchay in the east.
- Langabiz-Harami low mountain zone is situated between the Kur-Araz depression in the south, Shamakhi-Gobustan region distinguished within the Greater Caucasus Province in the north, Girdimanchay valley in the west and Pirsaatchay valley in the east. Within the Study area, the zone is represented by Langabiz monoclinal range characterized by asymmetric structure with short and gentle northern slope and steep southern slope dissected by 300-350 m deep consequent valleys.

The region is characterized by dry semidesert climate, development of sierozems, mountain-brown and chestnut soils. Territories of the region are covered by steppe vegetation and partly semiarid forests, and widely used as winter pastures.

Within the region's boundaries, the corridor of "Azerbaijan TPP - Navahi SS" OHL extend along the southern foothills of Ajinohur, Khoshavend, Garamaryam and Langabiz ridges until reaching the western slope of the Alat ridge – part of Absheron-Gobustan physiographic region. Considering common geological, geomorphological, soil and hydrological features of these structures, this part of the Study area will be hereinafter referred to as Ajinohur-Langabiz low mountain zone.

B. Kudru-Shirvan physiographic region. Distinguished within the structure of the province of Kur-Araz depression, the region covers the lowland and piedmont territories of the left riverbank of Kur. An entire territory of the region corresponds to a sloping plain known as the Shirvan lowland. Generally flat surface of the lowland is partly complicated by the alluvial fans of Alijanchay, Turyanchay, Goychay, Girdimanchay and Aghsuchay rivers – the main water bodies crossed by "Azerbaijan TPP - Navahi SS" OHL corridor. The region is characterized by dry semi-desert climate, development of grey-meadow, grey-brown soils and solonchaks, spread of wetlands and steppe vegetation.

C. Absheron-Gobustan physiographic region. As part of the Greater Caucasus physiographic province, the region covers the southeastern termination of the mountain system, comprising the Absheron peninsula, as well as Gobustan mountains together with the adjoining sloping plain of the Caspian sea. With true altitudes varying from -28 to +800-1000, the region is bordered with Shirvan lowland from the south and the Caspian Sea from the east.

Part of the Study area that lies within the region's boundaries are confined to sublongitudinal and sublatitudinal Alat, Kijaki and Kamchi ridges of the Eastern Gobustan. The region, including part of the Study area is famous for its' mud volcanism and rich hydrocarbon resources. With underdeveloped hydrology, the

[23] Будагов Б.А. Геоморфология и новейшая тектоника ЮВ Кавказа. Баку, 1973

region is characterized by semidesert hilly and lowland landscapes, and covered with grey-meadow and saline soils.

6.4. Geology

Territory of Azerbaijan has got very complex geological structure. Situated in south-eastern Caucasus, Azerbaijan is characterized by highlands and flexures in the north and south on the one hand, and depressions and lowlands between and around them, on the other. Some parts of the latter are even located below the sea level. Hence, besides various geomorphological elements and diverse relief, there are also different geological and tectonic structures, as well as volcanic, sedimentary and metamorphic rocks in Azerbaijan. Their age differ from the Cambrian till The Quaternary periods.

Geologically, the Study area is confined to the lowland and low-mountain structures of the Middle and Lower Kur depression - a large sedimentary basin formed between the Greater Caucasus Mountains to the north and the Lesser Caucasus Mountains to the south as part of collision of the Arabian and Eurasian plates. This ongoing collision has resulted in the uplift of the Lesser and Greater Caucasus mountain systems and the formation of the Kur-Araz Depression, where the Shirvan lowland and Ajinohur-Langabiz low mountain zone are located. Another geological system of the Study area is the Eastern Gobustan - southeastern margin of the Greater Caucasus fold-and-thrust belt.

6.4.1. Geology of Ajinohur-Langabiz low mountain zone[24]

The Ajinohur-Langabiz zone lies within the Kur Depression, subject to active deformation due to the ongoing plate convergence. The tectonic activity has resulted in the following structural features in the Ajinohur-Langabiz zone:

- Folding: the sedimentary layers in the area have been intensely folded into anticlines and synclines due to the compressional forces associated with the plate collision.
- Thrust Faulting: several thrust faults are present in the area, where older rocks have been pushed over younger ones. These faults are responsible for the uplift of the region and the formation of some of the hills and mountains.
- Strike-Slip Faulting: Strike-slip faults, characterized by horizontal movement along the fault plane, also occur in the area. These faults can create zones of weakness and potential pathways for fluid migration.

The zone is a geologically significant region known for its unique formations and sedimentary sequences. The area is primarily composed of sedimentary rocks from the Mesozoic and Cenozoic eras. These include Cretaceous limestones, marls and sandstones, Paleogene marls, clays, and sandstones, as well as Neogene

[24] Geosciences of Azerbaijan: Volume I: Geology. Baku, 2016

sandstones, conglomerates, and marls. These sedimentary layers have been folded, faulted, and uplifted due to tectonic activity, leading to a diverse landscape with hills, valleys, and plateaus.

6.4.2. Geology of Shirvan lowland

Tectonically, the Shirvan lowland represents a foreland basin formed in front of the Greater Caucasus mountain range due to the flexure of the Earth's crust under the weight of the mountains. The northern boundary of the Shirvan lowland is marked by a series of thrust faults, where older rocks from the Greater Caucasus are thrust over the younger sedimentary rocks of the lowland. The sedimentary layers within the lowland are folded into anticlines and synclines due to the compressional forces. These folds are generally gentle and broad, but they can create local variations in the subsurface geology. In addition to the thrust faults, there are also strike-slip faults that cut across the lowland. These faults are characterized by horizontal movement along the fault plane and can create zones of weakness in the Earth's crust.

The Shirvan lowland is still tectonically active, as evidenced by ongoing seismicity and the presence of mud volcanoes. This ongoing activity indicates that the region is still adjusting to the ongoing collision of the Arabian and Eurasian plates.

In terms of the geological structure, the lowland represents a vast sedimentary basin filled with thick layers of deposits accumulated over millions of years. These sediments include:

- Alluvial deposits: Primarily sand, silt, and clay deposited by rivers, especially the Kur River.
- Marine deposits: Sediments deposited in ancient seas that once covered the area.
- Lacustrine deposits: Sediments deposited in lakes that formed within the basin.
- Aeolian deposits: Wind-blown sand and dust deposits, particularly in the drier areas.

The majority of the sediments in the Shirvan lowland were deposited during the Neogene and Quaternary periods, which span the last 23 million years. These deposits are relatively young and unconsolidated.

6.4.3. Geology of Eastern Gobustan

Gobustan, specifically its eastern part, is situated within the southeastern margin of the Greater Caucasus fold-and-thrust belt. This geological setting makes it a tectonically complex region, shaped by the ongoing collision between the Arabian and Eurasian tectonic plates. Eastern Gobustan belongs to the Shamakhi-Gobustan tectonic zone, which forms the eastern part of the Kakheti-Vendam-Gobustan mega-zone of the Greater Caucasus.

Shamakhi-Gobustan zone corresponds to a deep fault located on the dropped side of Girdimanchay-Valvalachay flexure, filled with Cenozoic sedimentary complex with Vandam Mesozoic uplift buried at its' foot. Surface folding structure of the zone is conditioned by how the Cenozoic rocks overly the Vandam facies sedimentary-volcanic complex on the one hand, and how the intra-formation tectonic faults are developed due to lateral compression in the plastic Paleocene-Miocene strata on the other. The northern flange of this west-to-east striking 120 km long flexure is covered by the allochthonous sheets of Govdagh-Sumgait nappe. The southern limb of the flexure (Langabiz-Alat anticline zone) overlies the southwest recumbent Pliocene-

Eo-pleistocene deposits of the Lower Kur depression. Overlying occurs along the Ajichay-Alat dislocation – southeastern extension of Ganikh-Ayrichay overthrust.

The Cenozoic deposits of Shamakhi-Gobustan zone are represented by the following 4 lithological-facies complexes: Paleocene-Eocene, Oligocene – Lower Miocene, Middle-Upper Miocene and Miocene (Pontian) – Pliocene. Mainly composed of clayey series, the complexes are more than 4000 m thick. Synclinal troughs located on the western flange of Absheron-Jeyrankechmez depression in the eastern part of the zone, have their Pliocene formations covered with up to 1200 m thick mixed molasses (clays, sands, sandstones, coarse limestones, gravels and volcanic ashes) dating back to the Absheron regional stage, which in turn are leveled by continental and marine deposits of Pleistocene-Holocene.

The Paleocene-Miocene deposits are exposed in the structure of relatively small, south inverted and heavily compressed isoclinal anticlines, mainly inverted towards the south, complicated by upthrust faults and divided by brachysynclines. The complex is unconformably overlapped by a thin inclined nappe of the Pontian and more recent deposits.

The zone is divided into the following 4 tectonic segments with different stratigraphic section and internal structure: Shamakhi, Sundi-Maraza, Central Gobustan and Eastern Gobustan. Lengthwise structure of the zone is in turn represented by at least three subzones, from the north to the south: Jangichay, Keyvandi-Shahgaya and Langabiz-Alat).

The tectonic structure of eastern Gobustan has significant implications for the region's landscape, natural resources, and hazards. The complex geology has created a diverse landscape with unique geological formations and mud volcanoes. The folded and faulted rocks also create traps for oil and gas, making Gobustan an important hydrocarbon-producing region. However, the active tectonics also pose a seismic hazard, making the region prone to earthquakes.

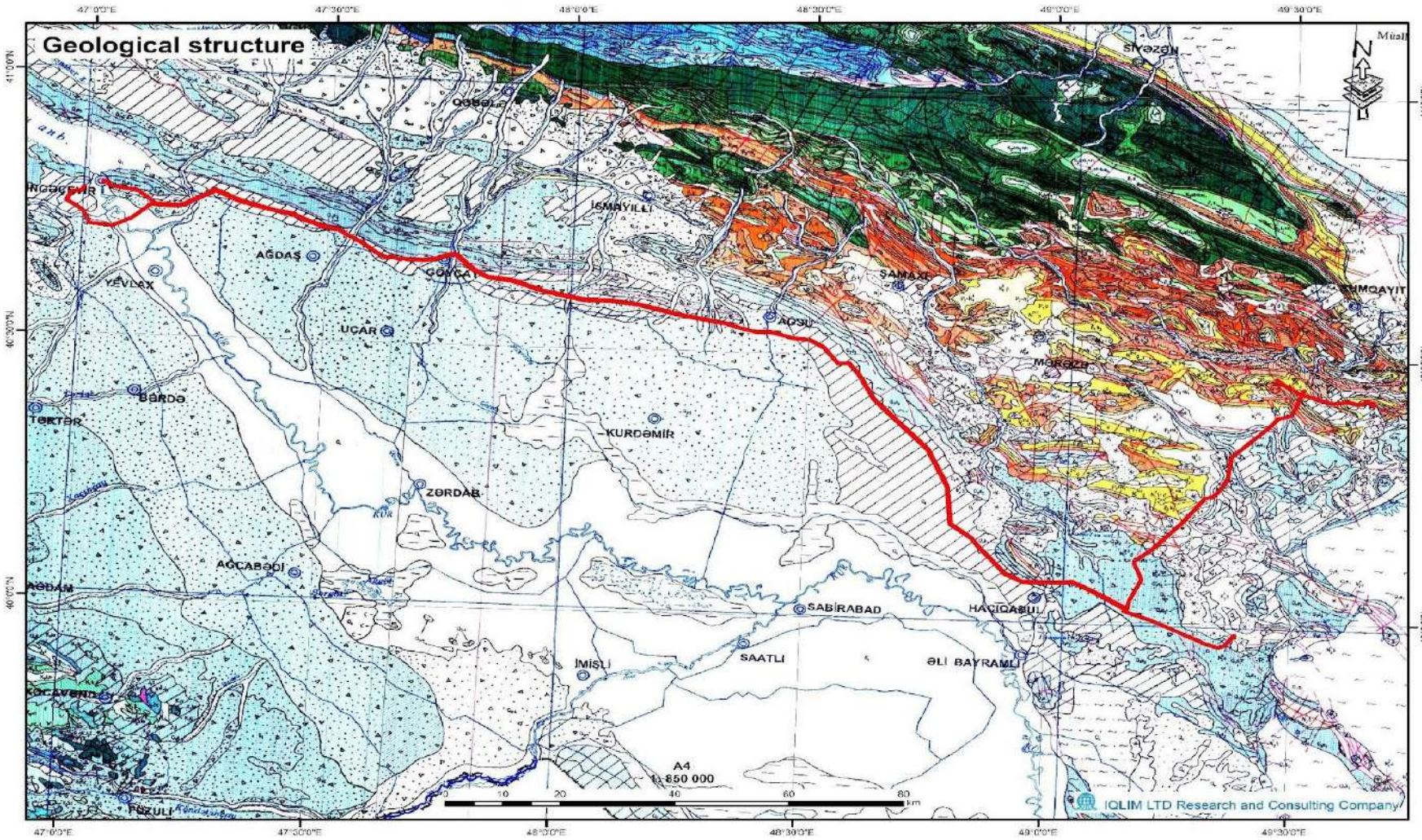


Figure 6.6: Geological structure of the Project area

Geological structure of the Project area (legends)

6.4.4. Mud Volcanoes

Gobustan is renowned for its remarkable mud volcanism, boasting the highest concentration of mud volcanoes in the world. Gobustan is home to roughly 350 out of the world's estimated 700 mud volcanoes, making it a global hotspot for this geological phenomenon. The mud volcanoes in Gobustan vary in size, shape, and activity level. Some are small and cone-shaped, while others form vast plateaus or sprawling fields of mud. Gobustan's mud volcanoes exhibit varying degrees of activity, with some erupting regularly and others remaining dormant for extended periods. The erupted mud varies in composition, ranging from fine-grained clay to coarser sediments with fragments of rock and other debris. Mud volcano eruptions are often accompanied by the release of gases, primarily methane, which can sometimes ignite, creating impressive flames.

The mud volcanoes in Gobustan is attributed to several factors, including tectonic activity, presence of hydrocarbon reservoirs, pressure from which can contribute to the eruption of mud volcanoes, and the sedimentary Layers providing the source material for the mud that erupts from the volcanoes.

Within the Study area, there are several mud volcanos active in a relative vicinity from the project facilities. Most of them are located in the part of the Study area confined to the Southeastern Gobustan and far eastern flange of the Shirvan lowland. The closest volcanos are Boransiz Cilga, Girishdagh, Aghzibir, Davalidagh, Gilinj, Durandagh, Goturdagh and Kichik Harami volcanos.

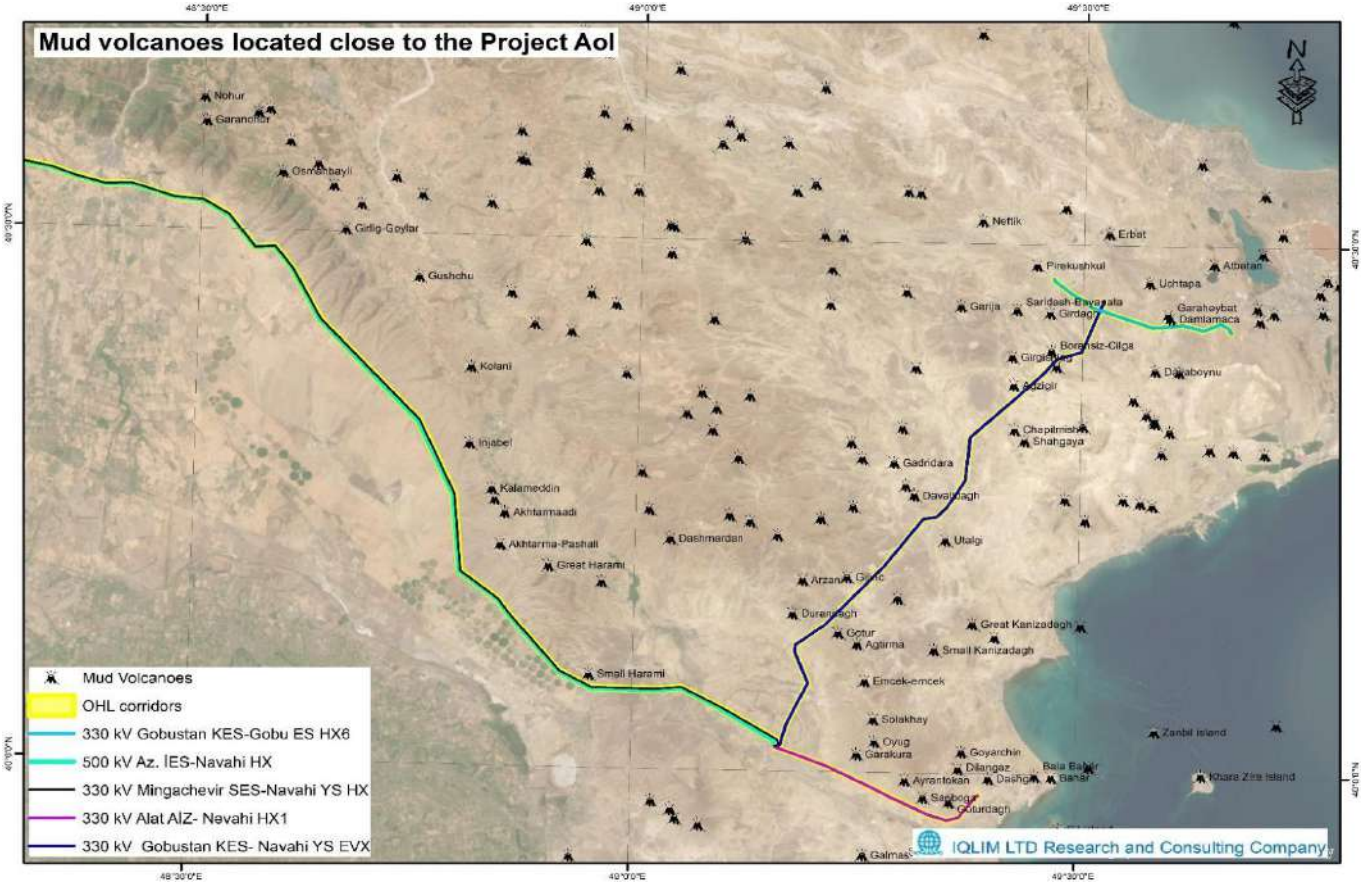


Figure 6.7: Mud volcanoes located close to the Project AoI

6.4.5. Geomorphology

Ajinohur-Langabiz low mountains

The Ajinohur-Langabiz area in Azerbaijan is a region with diverse geomorphological features shaped by a combination of tectonic activity, sedimentary deposition, and erosion. While specific details on this particular area might be limited, I can provide a general overview based on the regional geomorphology and available information:

- **Hills and Ridges**: The area is characterized by a series of hills and ridges, formed mainly by the folding and uplift of sedimentary layers due to tectonic activity. These hills and ridges vary in elevation and can create a rugged terrain.
- **Valleys**: Valleys are formed between the hills and ridges, often carved by rivers and streams. These valleys can be narrow and steep-sided or wider and more open, depending on the underlying geology and erosional processes.
- **Plateaus**: Some parts of the Ajinohur-Langabiz area feature elevated plateaus, which are flat or gently sloping areas at a higher elevation than the surrounding landscape. These plateaus are often capped by resistant rock layers, protecting them from erosion.
- **Alluvial Plains**: Along the river valleys, alluvial plains can be found. These are flat areas formed by the deposition of sediments carried by rivers. The soils in these plains are often fertile and suitable for agriculture.
- **Mud Volcanoes:** As mentioned previously, mud volcanoes are present in the area, creating distinctive conical or dome-shaped landforms. The mud extruded from these volcanoes can form small flows and contribute to the local topography.
- **Erosional Features**: The landscape is also shaped by various erosional processes, such as weathering, gully erosion, and mass wasting. These processes can create features like cliffs, gullies, and landslides.

Overall, the geomorphology of the Ajinohur-Langabiz area is a result of the interplay between tectonic uplift, sedimentary deposition, and erosional processes. This complex interaction has created a diverse landscape with a variety of landforms, each with its own unique geological history and ecological significance.

Shirvan lowland

The lowland is characterized by a flat, low-lying terrain with elevations ranging from 16 to 100 meters above sea level. The landscape is predominantly steppe, with some areas featuring sand dunes and salt marshes. The Shirvan lowland, a vast plain in central Azerbaijan, exhibits a diverse geomorphology shaped by its geological history, tectonic activity, and climatic conditions. Its main geomorphological features include:

- **Alluvial Plains**: The Kur River and its tributaries have deposited vast amounts of sediments over time, forming extensive alluvial plains across the lowland. These plains are characterized by flat topography, fertile soils, and a network of meandering river channels.

- **Terraces**: Along the Kur River and its tributaries, there are distinct terraces, which are flat, step-like surfaces formed by the river's erosion and deposition during different periods. These terraces provide valuable insights into the region's geological and environmental history.
- **Dunes and Sandy Areas**: In some parts of the Shirvan lowland, especially towards the southeast, there are areas covered by sand dunes and sandy deposits. These formations are primarily the result of wind erosion and deposition, and their distribution is influenced by the prevailing wind patterns.
- **Salt Marshes and Depressions**: Due to the arid climate and high evaporation rates, the Shirvan lowland also features salt marshes and depressions, where salt accumulates due to the evaporation of water. These areas have unique ecological characteristics and are home to salt-tolerant vegetation.
- **Mud Volcanoes**: Although less numerous than in the Gobustan region, mud volcanoes can also be found in the Shirvan lowland. These geological features are formed by the eruption of mud, water, and gases from underground and create small mounds and cones on the landscape;
- **Alluvial fans and valleys**. Throughout its' entire extension, the surface of Shirvan lowland is complicated by alluvial fans and lowland valleys of several major left-bank tributaries of Kur, namely Alijanchay, Turyanchay, Girdimanchay, Aghsuchay and Pirsaatchay.
- **Anthropogenic Features**: The geomorphology of the Shirvan lowland has also been significantly altered by human activities, such as the construction of canals, reservoirs, and other infrastructure for irrigation and agriculture.

Eastern Gobustan

Eastern Gobustan boasts a captivating and diverse geomorphology shaped by millions of years of geological processes, including tectonic uplift, erosion, and deposition. The region's unique landscape is characterized by:

- **Mud Volcanoes**: As mentioned earlier, eastern Gobustan is a global hotspot for mud volcanoes, with over 300 active volcanoes dotting the landscape. These geological formations, created by the eruption of mud, water, and gases from the subsurface, form cones, craters, and plateaus of varying sizes and shapes, creating a surreal and otherworldly scene.
- **Cuesta Scarps**: These striking geological features are steep, asymmetric ridges formed by the differential erosion of tilted sedimentary layers. In eastern Gobustan, the cuesta scarps are typically composed of resistant limestone and sandstone layers, forming impressive cliffs and slopes that offer stunning panoramic views of the surrounding landscape.
- **Gorges and Ravines**: The relentless forces of water erosion have carved deep gorges and ravines into the sedimentary rocks of eastern Gobustan. These dramatic features not only add to the region's scenic beauty but also provide valuable habitats for wildlife, including rare and endangered species.
- **Plateaus and Mesas:** The landscape of eastern Gobustan is dotted with elevated plateaus and mesas, which are flat-topped landforms with steep sides. These formations, often capped by resistant rock layers, rise prominently above the surrounding terrain, creating a stark and awe-inspiring contrast.

- **Rock Shelters and Caves**: The sedimentary rocks of eastern Gobustan are riddled with numerous rock shelters and caves, formed by the weathering and erosion of softer rock layers. These natural cavities have been used by humans for millennia as shelters, ritual sites, and even canvases for ancient rock art.
- **Ancient River Terraces**: The ancient Kur River, which once flowed through eastern Gobustan, has left behind a series of terraces, which are elevated flat areas marking former river levels. These terraces offer valuable clues about the region's geological and environmental history, as well as the evolution of the river system.
- **Tectonic Structures:** The complex tectonic history of the region is evident in the numerous folds, faults, and joints that can be observed in the rock formations of eastern Gobustan. These structures are a testament to the powerful forces that have shaped the landscape over millions of years.

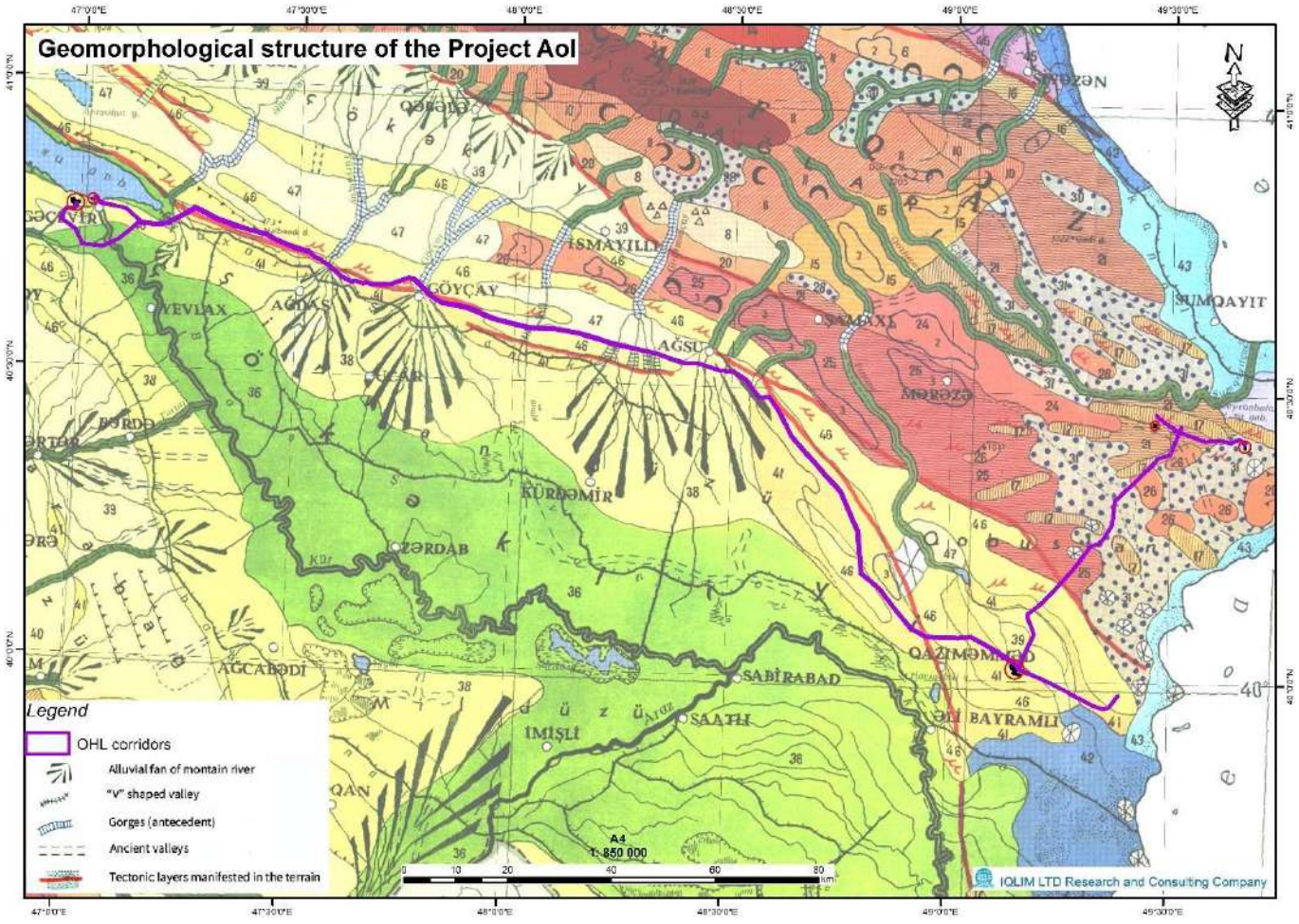


Figure 6.8: Geomorphological map of the Project AoI

6.4.6. Seismicity and earthquake hazards

The territory of the Azerbaijan Republic is located in the Caucasus segment of the complex Alpine-Himalayan mountain-fold system. Alike the entire system, Azerbaijan is characterized by the continuous slow diastrophic activity that is intangible for a human perception, as well as by sudden and strong tectonic movements commonly known as the earthquake generating seismic events. Often recorded only by seismic detectors, such seismic events are quite frequent, occurring with short time intervals.

In general, the territory of Azerbaijan is located in the region which is distinguished for its' increased seismic activity. Earthquakes with different intensities occur in the region depending on a number of factors, to include tectonic structure and geological environment specifics, seismic focus depth, tectonic movement amplitude, deformation type, etc.

It has to be mentioned that there had been many catastrophic M≥6 earthquakes occurred historically on the territory of Azerbaijan, including 1139 Goy-Gol, 1668 East Caucasus, 1842 Mashtaga, several Shamakhi (1192, 1667, 1669, 1828, 1859, 1868, 1872, 1902) and Caspian Sea (957, 1812, 1842, 1852, 1911, 1935, 1961, 1963, 1986, 1989, 2000) earthquakes. In recent years, the country's territory was stricken by the destructing earthquakes occurred in Aghdash (June, 1999), Lankaran (1999), Baku (November, 2000) and Zagatala (2012). Additionally, seismic activity had considerably increased in the other parts of the state as well.

The project area belongs to the 8-point zone based on the seismic zoning map of Azerbaijan (Figure 6.10). However, some researchers consider these areas, especially the south-eastern Gobustan, to be a "non-seismic" zone. They attribute this to the activity of existing mud volcanoes in the area. Mild volcanic eruptions cause weak seismic vibrations. Although there are many mud volcanoes in the Absheron Peninsula and Gobustan, seismic activity is higher there and in the surrounding sea. From 1830 to 2000, more than 100 earthquakes were recorded here, with a magnitude of 4-8. The magnitude of the Mashtaga earthquake in 1842 was 8 points. The second strongest earthquake historically occurred in the area's surroundings was 2000 Baku earthquake occurred on November 25 at 22:09 (18:09 UTC) local time with an epicentre just offshore Baku. It measured 6.8 on the moment magnitude scale and the maximum felt intensity was VII on the Mercalli intensity scale. It was followed three minutes later by an aftershock measuring 5.9. Most earthquake epicenters are located offshore but some are confined to the Ajichay-Alat zone of faulting dislocations.

According to the Republican Seismic Survey Center of ANAS, the last, relatively strong earthquake was recorded on 07/04/2023 at 00:01 local time, 52 km north of Siyazan station, in the Caspian Sea. The earthquake was felt in Guba, Khachmaz, Shabran and Siyazan district with a magnitude of 6, as well as in Sumgait and on the Absheron Peninsula with a magnitude of 5-4[25].

[25] https://seismology.az/az/zelzele/182

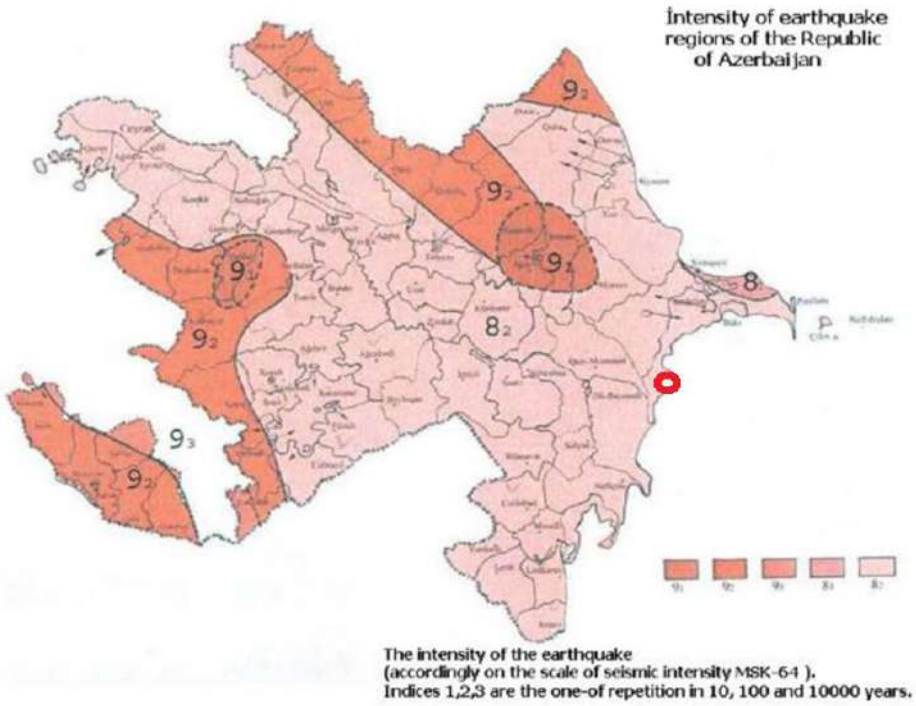


Figure 6.9: Seismic zones of Azerbaijan

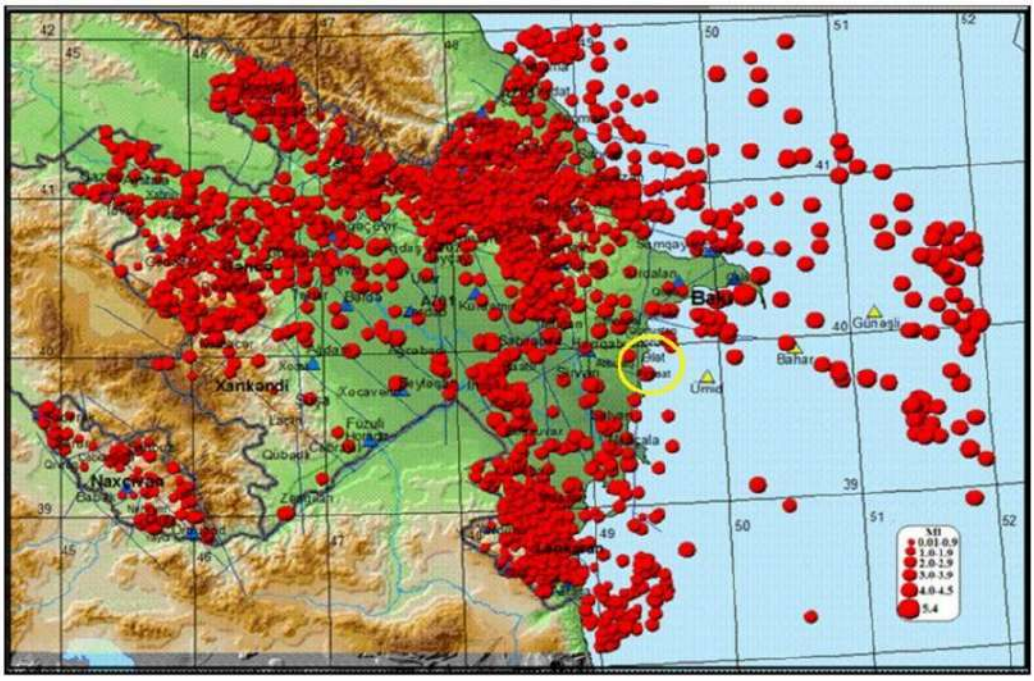


Figure 6.10: Index map of the recorded earthquake distribution in Azerbaijan (1973-2023)[26].

[26] Republican Seismic Survey Center of Azerbaijan National Academy of Sciences. http://www.seismology.az/az/#.WnhtwaiWaUk

6.4.7. Exogenous hazards

The Ajinohur-Langabiz zone is prone to several exogenous hazards due to its geographic location and geological characteristics. These hazards can pose significant risks to the local population, infrastructure, and environment. Some of the key exogenous hazards in this area include:

- Landslides: The mountainous terrain, predominantly badland cover and unstable slopes make the area susceptible to landslides, especially during periods of heavy rainfall or seismic activity. Landslides can cause damage to roads, buildings, and agricultural lands, as well as result in loss of life.
- Floods: Main rivers of the area, especially water-abundant Turyanchay, Goychay and Girdimanchay, can experience flash floods during periods of intense rainfall. These floods can inundate low-lying areas of Ajinohur and Langabiz ranges, causing damage to infrastructure and agricultural lands.
- Soil Erosion: The combination of steep slopes, deforestation, and unsustainable agricultural practices can lead to significant soil erosion in the area. This can result in the loss of fertile topsoil, reduced agricultural productivity, and increased sediment load in rivers.

The Shirvan Lowland is prone to a number of exogenous hazards which can pose significant risks to the local population, infrastructure, and environment. Some of the key hazards in this area include:

- Floods: The Shirvan Lowland is traversed by the Kur River and its tributaries, which can experience seasonal flooding due to snowmelt in the spring and heavy rainfall in the fall. These floods can inundate vast areas of the lowland, causing damage to infrastructure, agricultural lands, and settlements.
- Soil Salinity and Desertification: The arid climate and poor drainage in the Shirvan Lowland contribute to soil salinity and desertification. High evaporation rates lead to the accumulation of salts in the soil, making it unsuitable for agriculture. Desertification further degrades the land, reducing its productivity and making it more vulnerable to erosion.
- Wind Erosion: The strong winds that sweep across the Shirvan Lowland can cause significant wind erosion, especially in areas with sparse vegetation cover. Wind erosion can strip away fertile topsoil, degrade agricultural lands, and contribute to dust storms, which can pose health risks and disrupt transportation.

As mentioned above, the Eastern Gobustan is characterized by its arid climate, rugged terrain, and unique geological formations. Due to these factors, the area is prone to several exogenous hazards that pose risks to both the environment and human activities.

- Landslides and Rockfalls: The steep slopes and unstable rock formations in the eastern Gobustan make the area susceptible to landslides and rockfalls, especially during periods of heavy rainfall or seismic activity. These events can damage infrastructure, block roads, and endanger human lives.
- Soil Erosion: The sparse vegetation cover and exposed soil in the eastern Gobustan make the area vulnerable to soil erosion caused by wind and water. This can lead to the loss of fertile topsoil, degradation of agricultural land, and increased sedimentation in rivers and streams.

- Flash Floods: While the region receives limited rainfall, intense storms can cause flash floods in the dry riverbeds and canyons. These sudden floods can pose a significant risk to hikers, campers, and settlements in the area.
- Desertification: The arid climate and increasing human activities, such as overgrazing and deforestation, can contribute to desertification in the eastern Gobustan. This process leads to the degradation of land, loss of biodiversity, and increased vulnerability to other hazards like wind erosion.

6.5. Soils and land use

Pre-project soil cover quality of the Project AoI was studied using the following methods:

- Study of published soil maps and scientific literature about soils in the region
- Analysis of data obtained from the other projects carried out in the Study area
- Collection of soil samples and laboratory analysis of their quality indicators and contamination level
- Obtaining and analysis of the landuse data from local authorities and community members.

6.5.1. Soils

Types and quality parameters of soils in the Study area vary depending on altitude, soil forming factors such as climate and landcover, as well as specifics of underlying rock formations. Thus, according to the regularities of altitude zonation, the distribution of soil types in Azerbaijan are as follows within the hypsometry of the Study area:

- Lowlands of Kur-Araz depression (0-200 meters ASL) are usually covered by grey-brown soils formed under semi-desert and dry steppe conditions. These soils are often saline and not very fertile. Some parts of the lowlands are also covered by meadow-grey soils developed in the areas with higher groundwater levels, like the Kur floodplain. These soils are more fertile than grey-brown soils but can also be saline. Finally, banks and deltas of the lowland rivers are covered by the alluvial soils deposited by historical floods in the rivers.
- Foothills (200-1000 meters ASL) are typically covered by brown forest and chestnut soils. The former are common in the lower mountain slopes, under deciduous forests. Such soils are relatively fertile and suitable for agriculture. The chestnut soils are developed in drier areas of the foothills, under steppe vegetation. They are less fertile than brown forest soils.

A. Ajinohur-Langabiz zone.

Geographical setting, along with variations in elevation and local climate, results in a diverse soil cover of the zone. Within the Study area of OHL corridors, the zone is covered by mainly light, typical and dark mountain grey-brown (chestnut), as well as alluvial-meadow soils in the river floodplains. In steep and badland parts of the ridges rock Outcrops and skeletal soils are also developed.

1. Gray-brown (chestnut) soils are distributed across plains, foothills, and low mountainous parts of Azerbaijan. They have developed on calcareous bedrock under xerophytic grasses and shrubs in subtropical climates characterized by short humid periods with mild winters and long, hot, dry summers. The aridity of the climate promotes active mineralization of organic matter, resulting in low humus content in these soils. The relatively low precipitation (220-500 mm) and prolonged periods of high temperatures contribute to internal weathering within the soil. This leads to the accumulation of poorly soluble weathering and soil formation products within the soil profile. Consequently, gray-brown soils typically exhibit an argillic horizon in the middle section of the soil profile. The humus horizons of these soils are gray in colour with brownish hues. They contain low amounts of humus and are moderately thick. The presence of nut-like or granular structure in the lower part of the humus horizons and the transition horizons, along with a distinct illuvial carbonate horizon and the presence of carbonates starting from the soil surface, are characteristic features of these soils.

- ***Light grey-brown*** (chestnut) soils possess a thin humus layer, with humus content typically ranging from 1.5% to 2%. The soil profile exhibits weak differentiation into genetic horizons, and the illuvial carbonate horizon is also poorly expressed. Light gray-brown soils have a higher dry residue of water extract, indicating a greater abundance of water-soluble salts. The cation exchange capacity (CEC) ranges from 20 to 25 milliequivalents per 100 grams of soil. Calcium and magnesium are the dominant exchangeable bases, while sodium content varies between 5% and 10%. However, salinity is not a characteristic feature of gray-brown (chestnut) soils.
- ***Typical gray-brown*** soils are characterized by a thinner humus horizon (35-45 cm). The humus content in the A horizon is 2-3%. The cation exchange capacity ranges from 25 to 30 milliequivalents per 100 grams of soil.
- ***Dark gray-brown*** soils exhibit a higher humus content in their upper horizon, ranging from 3.0% to 4.5%. The composition of humus substances is dominated by humic acids over fulvic acids. These soils are characterized by a thick humus horizon (A+B1), typically around 50 cm. A distinct carbonate horizon (Bk) is evident at a depth of 60-80 cm in the profile. The content of water-soluble salts does not exceed 0.1%. The reaction of the upper horizons is slightly alkaline (pH 7.7), with alkalinity gradually increasing with depth. The cation exchange capacity (CEC) in the A horizon is 30 milliequivalents per 100 grams of soil. Calcium constitutes 70-75% of the exchangeable bases, followed by approximately 15-20% magnesium and 5-6% sodium. The middle section of the gray-brown soil profile is somewhat compacted due to the abundance of clay fractions and oxides.

2. Alluvial meadow soils are developed in the areas with relatively shallow groundwater levels (1-2 meters) on loamy and clayey alluvium of central floodplains. The abundance of nutrients, bases, and organic matter, along with favourable moisture conditions due to groundwater influence, promote the growth of meadow vegetation and the process of turf formation. Consequently, alluvial meadow soils possess a well-defined humus horizon with granular or granular-crumb structure. In the literature, these soils are sometimes referred to as granular soils of floodplains. The profile structure of alluvial meadow soils is as follows:

- A0 - Sod layer (in raw soils), with grass roots concentrated in clumps.
- A1 - Dark-gray or gray humus horizon with brownish hues and granular structure.
- B1 - Transitional humus horizon, sometimes with signs of gleying (B1g).

- B2g - Transitional horizon with more pronounced gleying features, gradually transitioning into alluvial deposits with loamy and clayey granulometric composition (Cg).

In these soils, the capillary fringe of groundwater typically reaches the soil horizons, leading to gleying processes in the lower part of the soil profile. This also results in the accumulation of iron compounds, carbonates, and, in the floodplains of southern rivers, readily soluble salts. Alluvial meadow soils are rich in humus, have a thick humus layer, and a large reserve of nutrients. They possess high cation exchange capacity. The reaction of the soil solution varies widely (pH 4-6 and higher).

B. Shirvan lowland. The lowland within the Study area is covered by grey-meadow soils with low-to-high humus content. The meadow-grey soils (also known as meadow-chernozem soils) are intrazonal soils formed under conditions of additional surface moisture in depressions and floodplains of rivers in dry steppes and semi-deserts.

Meadow-gray soils are formed under conditions where the groundwater is located at a depth of 2.5-5 meters. They differ from automorphic gray soils by the increased intensity of the biological cycle, the thickness of the humus layer, and the abundance of humus. These soils are divided into two subtypes:

- Meadow-like gray soils are widespread in areas where the groundwater is located at a depth of 3.5-5.0 meters. Signs of gleying appear after two meters of depth.
- Meadow-gray soils are widespread in areas where the groundwater is located at a depth of 2.5-3.5 meters. These soils are more humic, and signs of gleying appear starting from a depth of 1 meter.

They are divided into the following types: ordinary, saline, and gravelly. Meadow-gray soils that have been modified under the influence of irrigation are distinguished as a separate type – irrigated meadow-gray soils.

Salinity level of the lowland's soils gradually increase towards the Caspian sea. Thus, alluvial salinization is characteristic of the relatively low-lying relief elements, the areas around swamps and lagoons, and the alluvial plains of the low terraces of the Caspian Sea. In two-thirds of the Kura-Araz lowland, the groundwater level is less than 5 meters deep from the soil surface. In summer, during the irrigation season, the groundwater level rises even further, and in autumn it falls. The mineralized groundwater close to the soil surface enters the upper layer of the soil through capillary action and salinizes the soil as a result of evaporation. In the foothill parts of the plain, deluvial and deluvial-proluvial salinization forms are encountered in the cones and valleys of mountain rivers. In the indicated areas, atmospheric precipitation falling on watersheds and mountain crops dissolves salts close to the earth's surface and carries them along to the foothills. Various salts accumulated here cause salinization of the soil and groundwater. In the deluvial-proluvial form of salinization, the salinization of river cone and river valley soils occurs due to salts brought by river waters. Saline soils of the Shirvan lowland are represented by their sulphate varieties with sodium sulfate accounting for more than 40% of the total salt content.

In the southeastern part of the Shirvan lowland, hydromorphic saline soils are more widespread in irrigated areas with relatively less fragmented relief. In these areas, groundwater is closer to the surface (1-2 meters deep) and significantly influences soil processes. A characteristic feature of these soils is the

accumulation of soluble salts in the upper layer of the soil (up to 20-40 cm deep and deeper). Soil cover of the areas close to the mud volcanos is of a hilly (mud volcano origin's) saline soils subtype.

C. Eastern Gobustan. Arid climate of the Gobustan region had created favourable conditions for the formation of semiarid relief and relevant soil and vegetation. Part of the Study area corresponding to the Eastern Gobustan are primarily covered by light and primitive gray, meadow-gray, slightly saline, and saline gray and gray-brown soils.

1. Light gray soils are common in relatively young relief elements. Light gray soils are formed mainly under wormwood-ephemeral plants. Due to local climatic conditions, the process of soil formation takes place in an indelible unwashable water regime. There is no clear differentiation of the genetic horizons of light gray soils in terms of the colour background; the profile is characterized by monotony. Light gray soils are characterized by high carbonate content. Carbonates are distributed relatively evenly, the illuvial-carbonate horizon is expressed weakly. One of the characteristic features of light-gray soils is the observation of easily-soluble minerals of salt and gypsum in the lower parts of the profile (60-80 cm). Saline soil types are predominant. The humus content in light gray soils is low. Its content does not exceed 1.2-1.5%. There is a sharp decrease in the amount of humus along with the profile to the lower layers. The absorption capacity is very low and amounts to 10-12 meq per 100 g of soil. These structureless soils (with primitive gray soils) are also in the northern and northeastern parts of the study area.

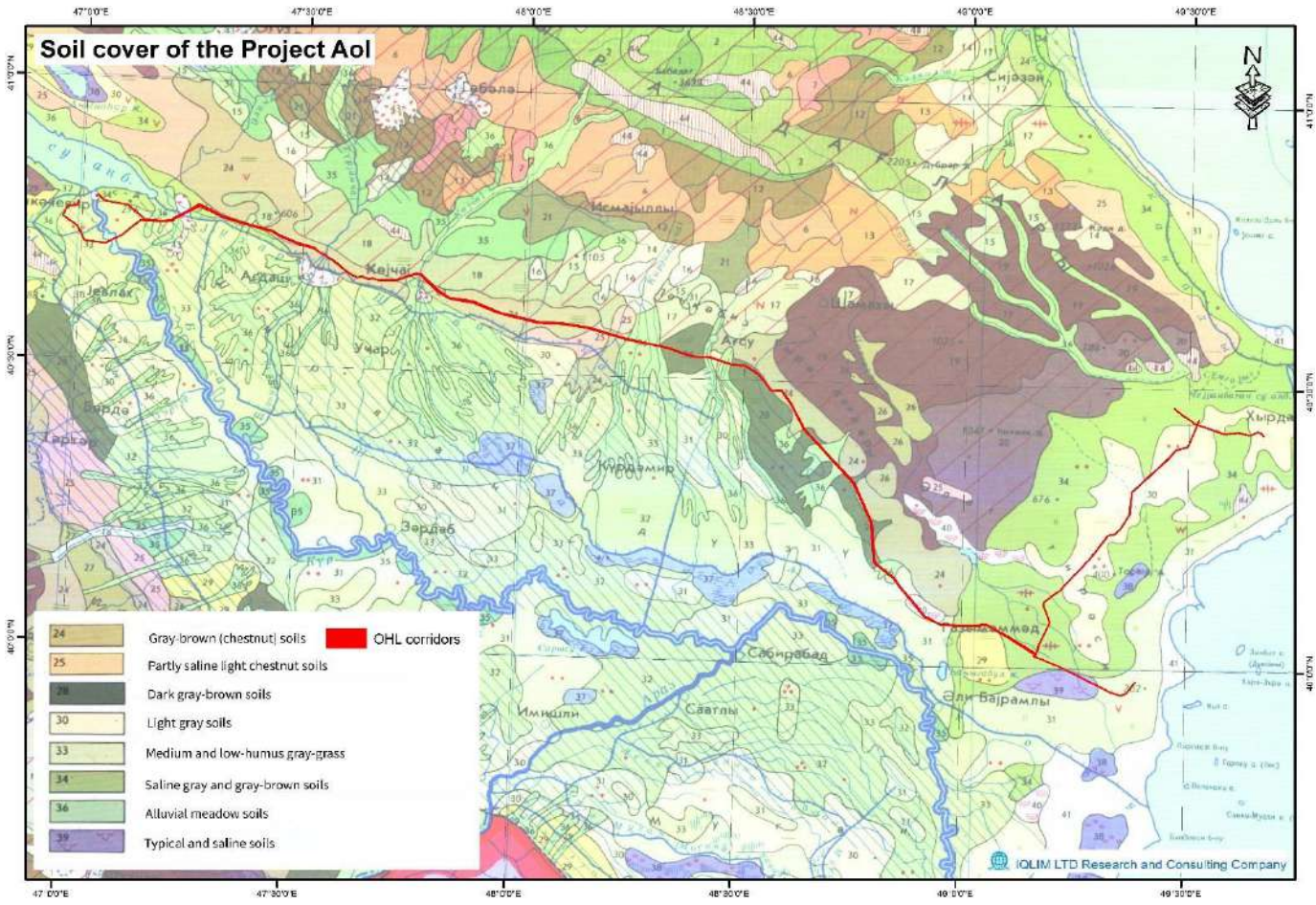


Figure 6.11: Soil cover of the Project AoI

2. Primitive grey soils are formed in less dissected areas of the relief, in some cases in depressions. Vegetation is poorly developed and does not form a continuous cover in these soils. The ephemeral plants growing there dry up and die in the hot summertime. Very little humus accumulates in the soil, just a small part of it can move to shallow depths. The humus content in the top layer does not exceed 0.8-1.1%. The profile of this type of soil is often monotonous light gray and even whitish gray. Genetic horizons are difficult to distinguish from each other and soil-forming rocks. The illuvial carbonate horizon is not clearly defined morphologically. Carbonates are unevenly distributed in the profile. Primary gray soils are highly saline. In some cases, a clayey-saline crust is found on the surface. The amount of dry residue in the soil reaches 2.5-2.9%. Salinity is typical for the described soils.

6.5.2. Soil Quality

Within the field investigation programme of EBS, soil samples were collected from a total of 8 locations along all OHLs. The samples were taken from 20-40 cm deep holes dug with hand augers, collected in plastic sample containers and mixed with ceramic spoons. The prepared samples were sent to the laboratory, where they were analyzed for 17 parameters to determine chemical composition and heavy metal content of the samples. Description of sampling locations and main soil parameters is provided in Table 6.1 below.

Soil quality monitoring results

As seen from the soil quality monitoring results, as well as from the data on TPH and heavy metal contents, soil concentrations of many elements are within the accepted norms in the project area. However, it has been found during monitoring that some elements exceed the maximum permissible concentrations as follows:

- All samples demonstrated significant exceed in the concentration levels of cobalt and chromium, varying from 7 to 14 mg/kg of cobalt with MAC levels of 5 mg/kg, and from 22 to 42 mg/kg of chromium with MAC levels of 6 mg/kg
- Concentration levels of nickel exceeded the accepted norm of 30.0 mg/kg in SS3, SS4, SS5 and SS6
- Excessive arsenic concentrations were registered in SS2, SS3, SS5, SS7 and SS8, ranging from 2.2 to 4.8 mg/kg with MAC levels of 2.

Increased cobalt, chromium, nickel and arsenic levels in soil can be caused by both natural and human activities. Naturally, cobalt can be high in soils formed from certain rocks or released by weathering. Human actions, such as industrial pollution, mining, and fertilizer use, also contribute to elevated cobalt levels. These increased levels can harm plants, animals, and even humans through the food chain, making it important to understand and address the causes. Laboratory analysis results of the collected soil samples are given in Annex 2.

Table 6.1. Main characteristics of soil sampling locations

Sampling point	SQ1	SQ2	SQ3	SQ4	SQ5	SQ6	SQ7	SQ8
Coordinates	40°45'37.57"	40°44'58.98"	40°40'7.78"	40°34'7.74"	40°11'38.69"	39°57'31.95"	40°13'51.16"	40°27'25.85"
	46°57'42.22"	47°11'52.95"	47°36'24.99"	48°13'55.14"	48°48'11.43"	49°20'26.22"	49°18'46.38"	49°29'1.07"B
Sampling date	24.07.2024	24.07.2024	23.07.2024	23.07.2024	22.07.2024	22.07.2024	22.07.2024	22.07.2024
Sampling time	17:30	13:15	18:30	10:10	18:50	14:50	13:30	12:00
Sampling depth, *cm*	30	30	30	30	30	30	30	30
Radiation µr/hour	9	11	8	10	9	7	10	8
Sample description	Gray-brown, sandy-dusty-clayey	Gray-brown, dusty-clayey, with brick fragments	Gray-brown, dusty-clayey	Dark gray-brown	Light grey-brown, dusty-clayey-pebbly	Light grey-brown, sandy-dusty	Light grey-brown, dusty-clayey	Grey-brown, dusty-clayey
Location characteristics	1.2 km west of Secondary School No. 5 in Mingachevir city, cultivated field	Northeast of Gulovsha village, 0.1 km west of the brick production area	Pasture 0.8 km east of Arab village	Cultivated field 1.2 km north of Beyimly village, 1.7 km southwest of Padar village	Winter pasture 0.6 km east of the Hajigabul-Poladly road, 4 km southwest of the mud volcano	Pasture 1.3 km south of the Baku-Alat-Gazakh-Georgia highway	Pasture next to the winter farm, 0.16 km south of the Papaqdag, Sangachal-Jeyildag road	2.2 km southeast of the Baku-Shamakhi-Yevlakh road, 0.9 km south of AzerSpace

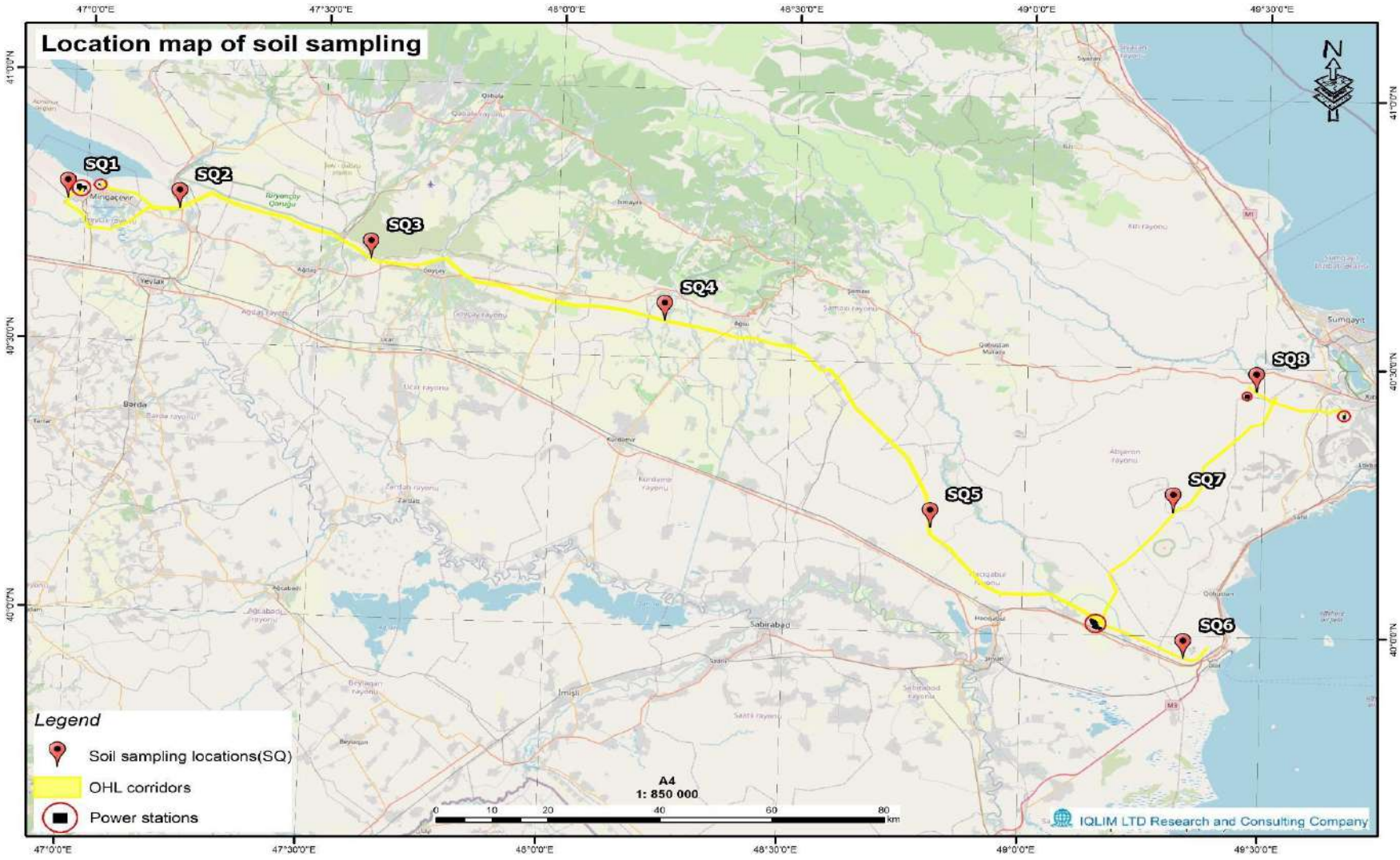


Figure 6.12: Map of soil sampling locations

6.5.3. Land Use

Shirvan lowland. The Shirvan Lowland is primarily used for agriculture. It is a semi-arid region, with large areas dedicated to irrigated and rain-fed farming. The main crops include cotton, grain (wheat, barley), grapes, and fruits. There are also some areas of pastureland for livestock grazing, primarily sheep and cattle. In addition, there are some small settlements and villages scattered throughout the lowland, with some industrial development related to agriculture and food processing.

Ajinohur-Langabiz zone. The Ajinohur-Langabiz zone is also primarily an agricultural region. The western half of the zone (mountainous areas to the west of Girdimanchay) is known for its irrigated farming, with cotton, grain, and alfalfa as the main crops. The eastern lands, on the other hand, are characterized by rain-fed farming of wheat and barley, as well as livestock grazing. The zone also has some agricultural processing industries, such as cotton ginning and grain milling.

Eastern Gobustan. Agriculture in this area relies heavily on rain-fed farming, with wheat, barley, and alfalfa being the main crops. Livestock grazing, particularly sheep and goats, is also a significant part of the agricultural landscape. Due to the environmental conditions, soil erosion, desertification, and water scarcity pose challenges to agriculture in Eastern Gobustan. However, efforts are underway to promote sustainable land management and water conservation practices to address these issues.

There are the following main land types detected along the Project AoI based on their landuse categories:

- OHL corridors – state owned rights-of-way of the previously built national and regional OHLs
- Residential lands – private, municipal and state owned lands of the Project affected settlements, allocated for the development of dwellings and individual households
- Agricultural lands – private, municipal and state owned agricultural lands used for irrigation and rainfed farming, including the land slots owned by the households
- Grasslands – private, municipal and state owned rainfed grasslands used by farmers for pastoral farming
- Protected lands – state owned lands of Turyanchay State Nature Reserve and Shirvan National Park, where any type of the landuse is prohibited.

Landuse of the Project AoI

During the environmental and social baseline studies, the land use status of the lands along OHL corridors was studied via spatial image studies and field surveys. The Table below summarizes the land use categories of the lands along all four rights-of-way. As the results of detailed topographic studies weren't available by the time of ESIA preparation, distance intervals of OHL rights-of-way were countent at relative figures.

Table 6.2. Land use categories of the Project AoI lands

District	İnterval (km)	Settlement	Landuse
"Azerbaijan TPP – Navahi SS" OHL (until merging with "Mingachevir HPP – Navahi SS" OHL)			
Mingechevir	0-4.07	Yeni Hayat	Residential area
	4.07-8.56	Yeni Hayat	Cultivated land (mainly annual, partly perennial plants)
Yevlakh district	8.56-11.86	Tanrigulular	Cultivated land (mainly annual, partly perennial plants) River valley of Kurekchay
	11.86-16.10	Huruuchaghi	Cultivated land (mainly annual, partly perennial plants)
	16.10-21.38		Kur valley
	21.38-22.09	Havarli	Cultivated land (annual plants, grassland)
	22.09-23.0		Salinated non-used lands
	23.0-24.0		Privately owned uncultivated lands
	24.0-25.0	Aksham	Cultivated land (annual plants)
Common right-of-way of "Azerbaijan TPP – Navahi SS" OHL			
Yevlakh district	0-6.35 1-1.7	Aksham, Gulovsha (northern outskirts) Aksham	Non-used badlands of Bozdagh range (summer pastures) Privately owned garden
	6.35-6.9 6.35-11.4	 Arabasra Yukhari Bujag	River valley of Alijanchay Cultivated lands (mainly annual, partly perennial plants)
	11.4-25.2		Cultivated lands (annual plants)
Aghdash district	25.2-32.9	Arabojaghi Goshagovag	Cultivated land (annual and perennial plants)
	32.9-33.7		Badlands of Ajinohur range
	33.7-36.7	Yukhari Aghjayazi Ashaghi Aghjayazi	Cultivated land (annual and perennial plants)
	36.7-38.6	Turyanchay	Cultivated land (annual and perennial plants)
	38.6-39.1	Turyanchay	River valley of Turyanchay
	39.1-39.75		Non-used badlands (summer pastures)
	39.75-40.65	Hushun	Cultivated lands (perennial and annual plants)
	40.65-41.8		Non-used badlands (summer pastures)
	41.8-46.75	Kukal Arab	Cultivated lands (perennial and annual plants) Badlands (summer pastures)
Goychay district	46.75-51.14 48.8-49.1	Mirzahuseynli	Cultivated lands (perennial and annual plants) Badlands (summer pastures) Privately owned farm
	51.14-56.45		
	56.44-58.75	Goychay	Northern outskirts
	58.75-59.4	Goychay	River valley of Goychay
	59.4-61.8	Garabaggal	Mountain Range
	61.8-78.0	Garabaggal-Garamaryam	Cultivated lands (perennial and annual plantations)
Ismayilli district	78.0-79.8	Yekekhana	River valley of Davabatanchay

District	İnterval (km)	Settlement	Landuse
	79.8-96.0	Gubakhalilli	Cultivated lands (annual plants) Mountain ridge
	96.0-97.5 99.8-101.9 102.5-103.5 104.2-105.1		River valley of Girdimanchay
	97.5-99.8 101.9-102.5 103.5-104.2		Cultivated lands in Girdimanchay valley (perennial and annual plants)
Aghsu district	104.2-132.7	Aghsu, Tekle, Ulguj, Garagoyunlu, Dashdemirbeyli, Gegeli, Bijo, Gashad,	Cultivated lands (annual and partly perennial plants) Aghsu river
	132.7-136.1	Langabiz	Grasslands, perennial plants
Shamakhi district	136.1-158.2	Chol Goylar, Ovchulu	Grasslands
Hajigabul district	158.2-200.3		Grasslands, badland
	200.3-233.0	Ranjbar, Pirsaat, Navahi,	Cultivated lands (annual plants) Pirsaat river
“Gobustan WPP – Navahi SS” OHL			
Absheron district Hajigabul district	0-54.5		Badland Grasslands Mud volcanos
	54.5-60.0	Navahi	Cultivated lands (annual plants)
“Gobustan WPP – Gobu SS” OHL			
Absheron district	0-19	Gobustan Gobu	Grasslands Badland Mud volcanos

Land-use maps of the Project AoI are given in the figures below.

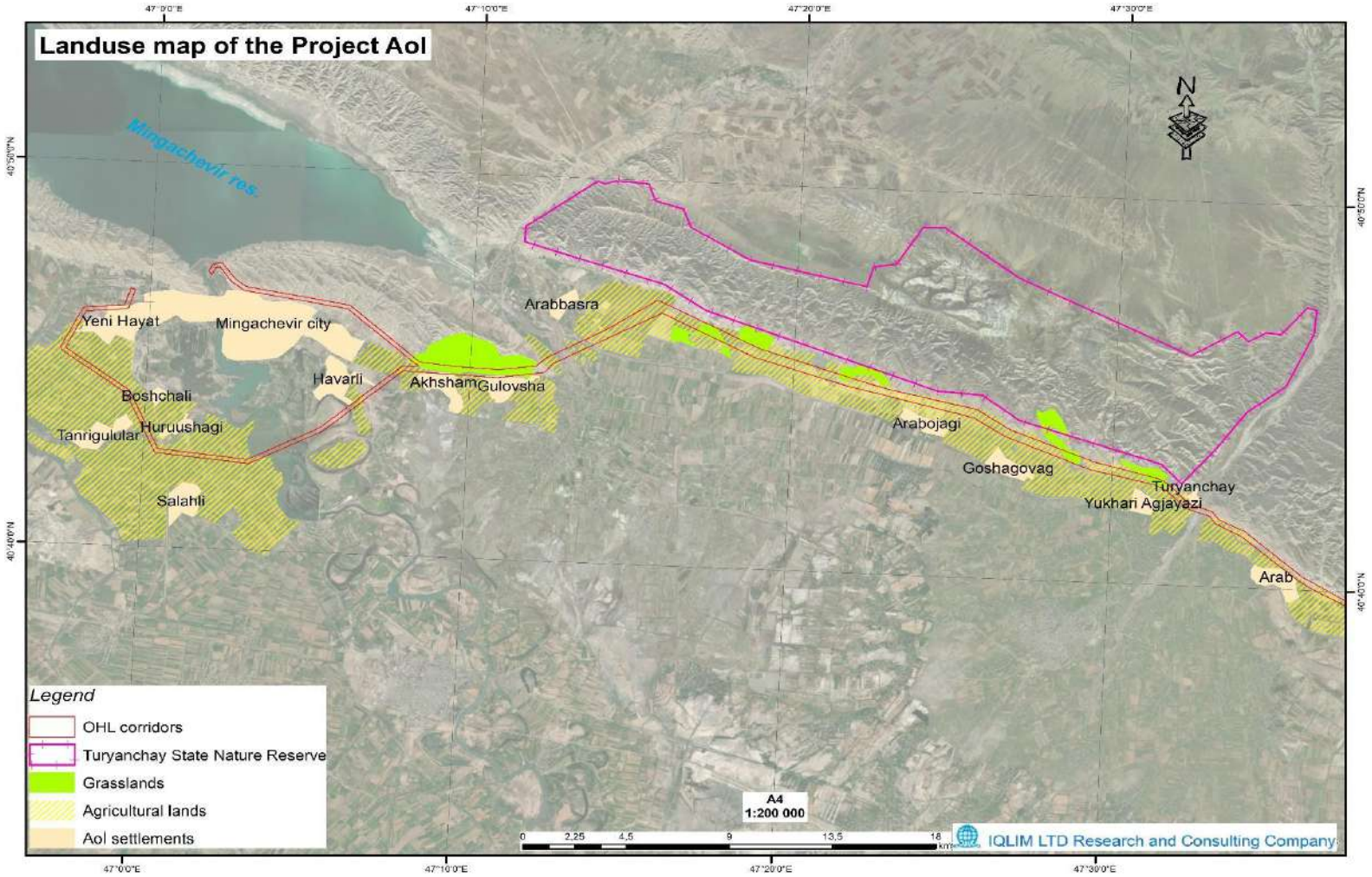


Figure 6.13: Land use map of the Project AoI: Mingachevir-Arab section

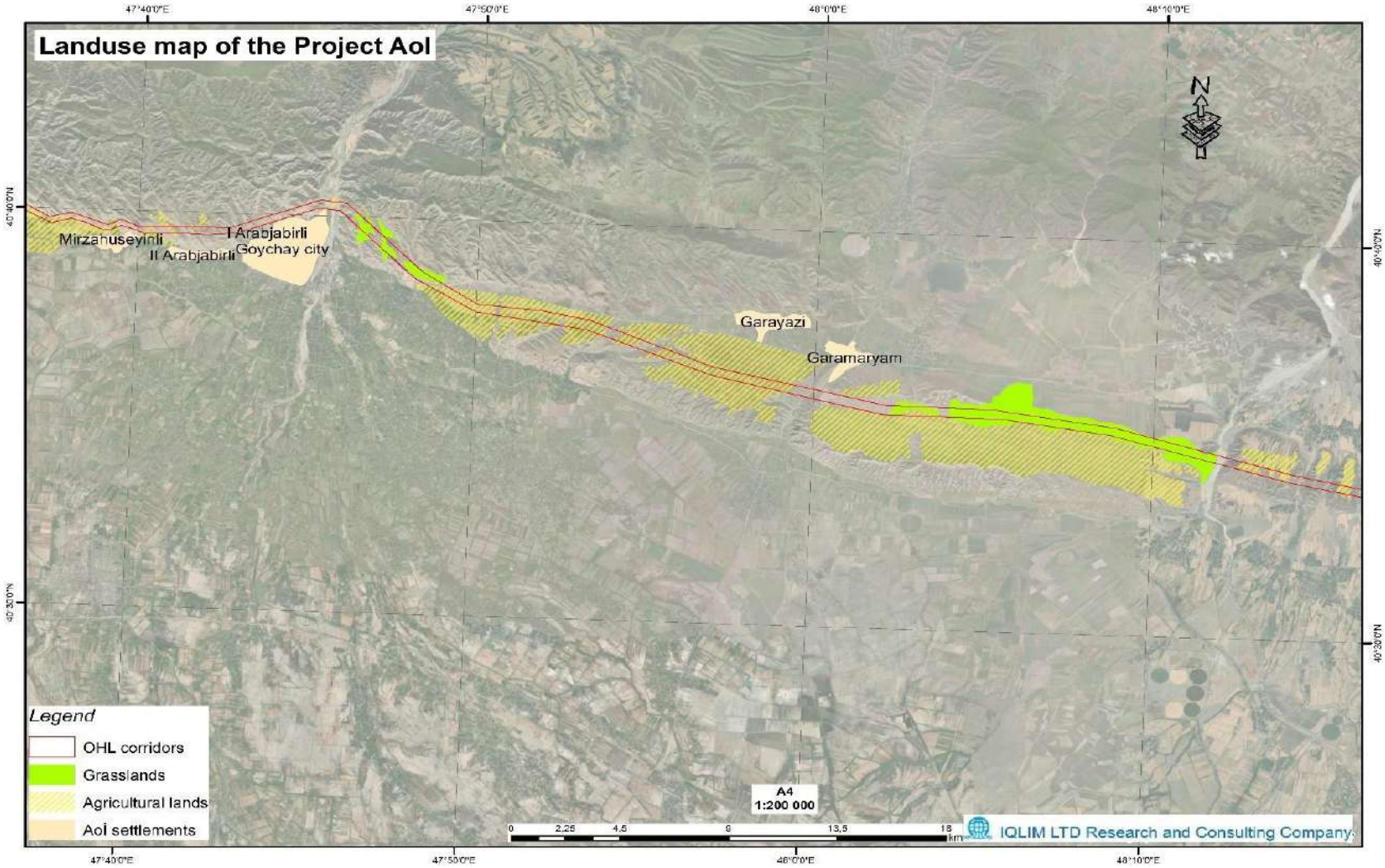


Figure 6.14: Land use map of the Project AoI: Mirzahuseynli-Girdimanchay section

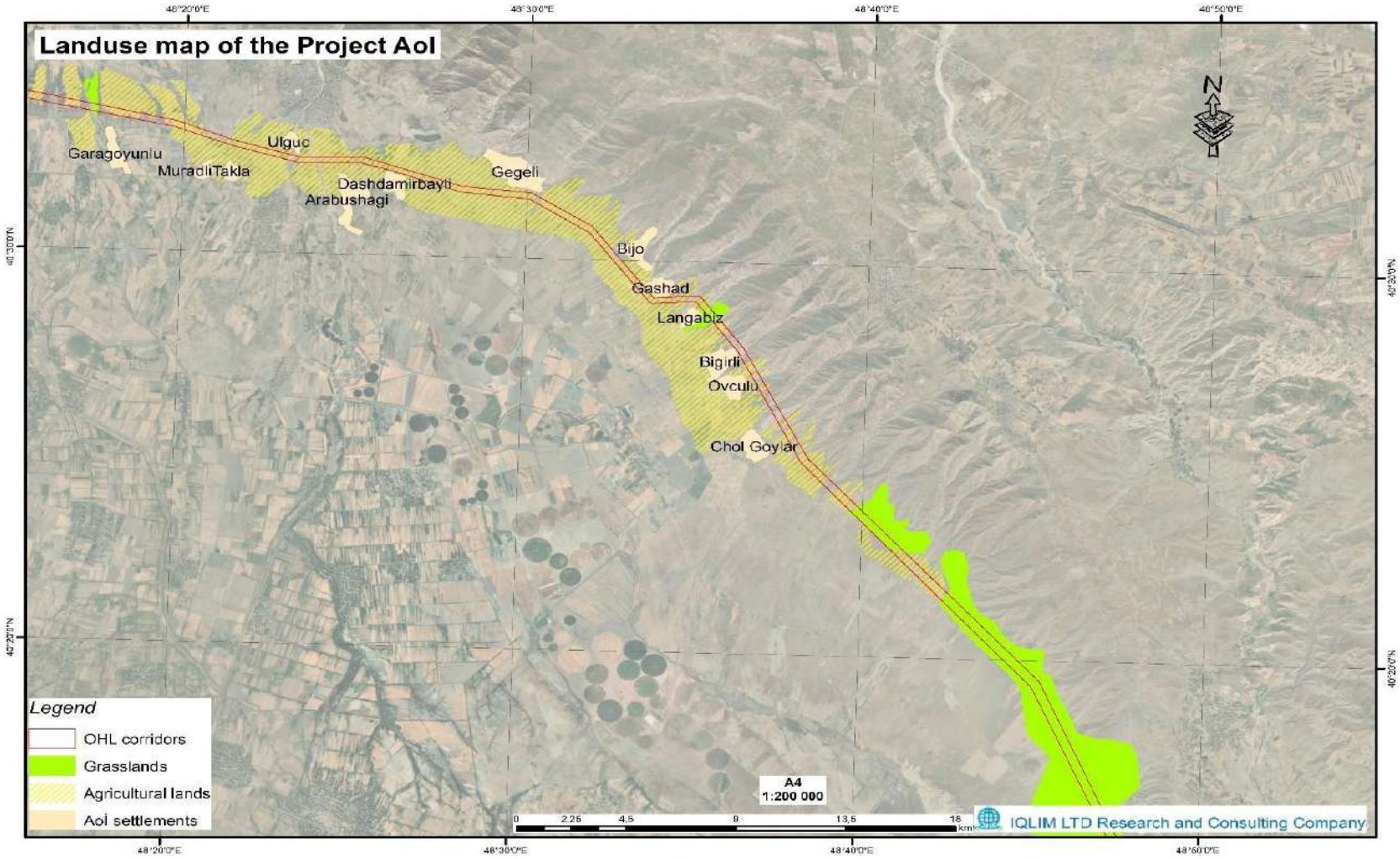


Figure 6.15: Land use map of the Project AoI: Muradli Takla – Navahi section

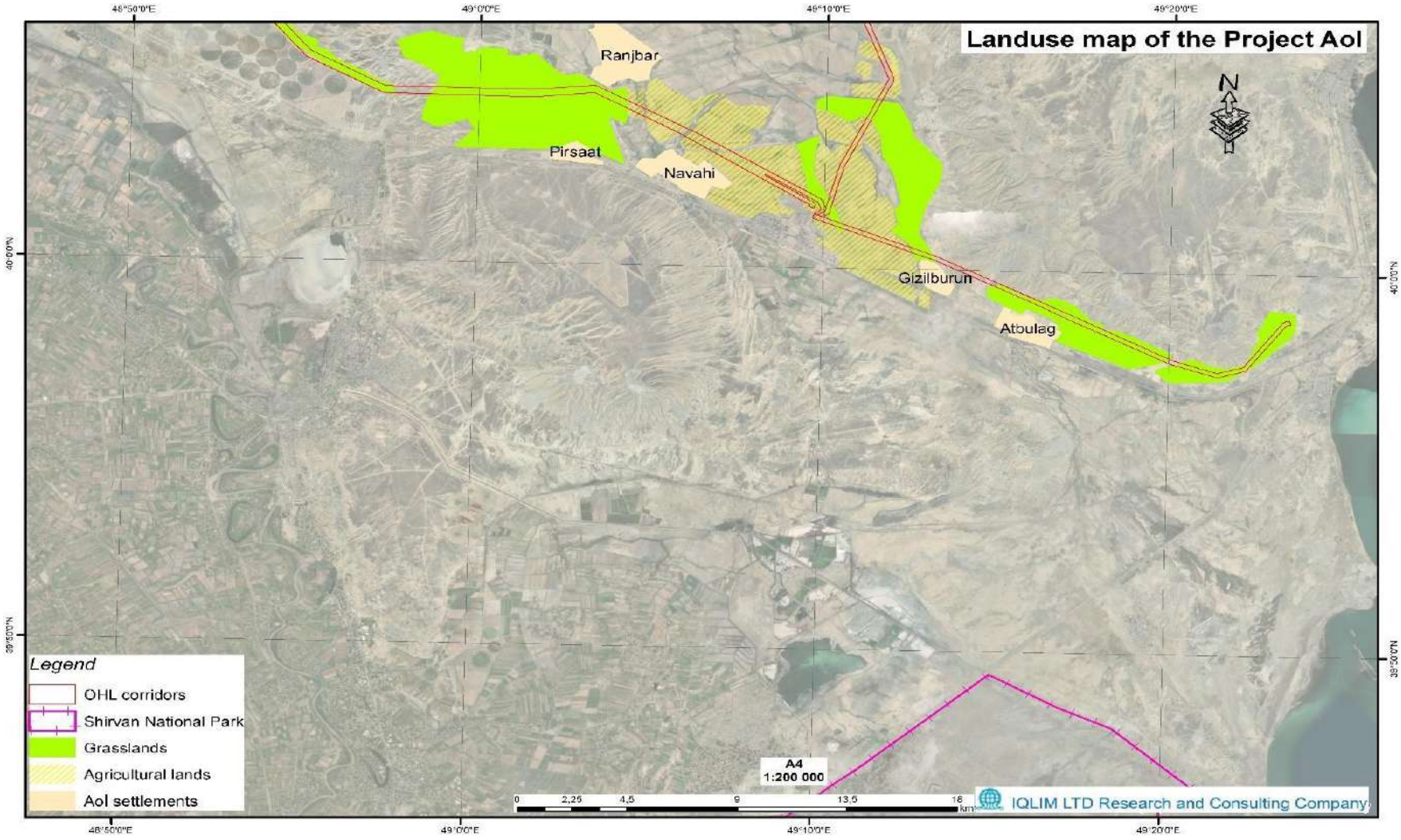


Figure 6.16: Land use map of the Project AoI: Navahi-Alat section

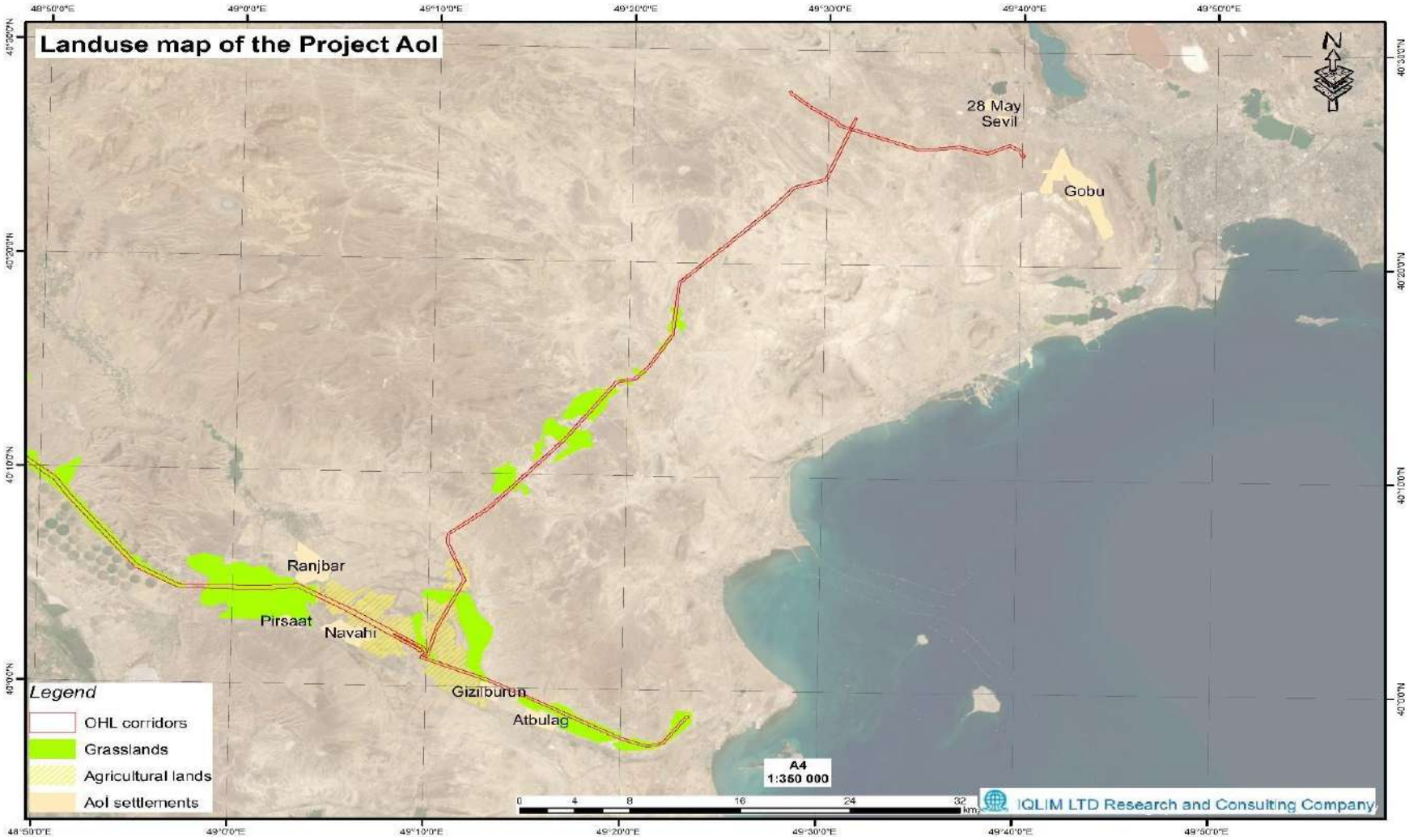


Figure 6.17: Land use map of the Project AoI: Navahi-Gobustan section

6.6. Hydrology and surface water resources

Pre-project condition of the Project AoI's surface water resources was studied using the following methods:

Study of published hydrological surveys

Analysis of data obtained from the other projects carried out in the Study area

Collection and laboratory analysis of surface water samples from the rivers and canals to determine their quality indicators and contamination level

Obtaining and analysis of the water use data from local authorities and community members.

6.6.1. Rivers

The primary source of surface water in the Study area is the Kur River, which flows through the region and receives numerous tributaries, including Kurakchay, Turyanchay, Girdimanchay, Goychay, Aghsuchay. In addition to Kur and the rivers forming its' left-bank basin, the Study area is crossed by Pirsaatchay river forming part of the Caspian Sea basin. Hydrological parameters of the Study area rivers is provided below.

1. Kur. The Kur River is a major river in the Caucasus region. It is an east-flowing river south of the Greater Caucasus Mountains which drains the southern slopes of the Greater Caucasus east into the Caspian Sea, and the north side of the Lesser Caucasus, while its main tributary, the Aras, drains the south side of those mountains. Starting in northeastern Turkey, the Kur flows through Turkey to Georgia, then to Azerbaijan, where it receives the Aras as a right tributary, and enters the Caspian Sea at Neftchala. The total length of the river is 1,515 km (941 mi). It is an important source of water for irrigation, hydropower, and domestic use. The river has a complex hydrological regime, influenced by climate, topography, and human activities.

It rises in northeastern Turkey in a small valley in the Kars Highlands of the Lesser Caucasus. It flows west, then north and east past Ardahan, and crosses into Georgia. It arcs to the northwest, then into a canyon near Akhaltsikhe where it starts to run northeast in a gorge for about 75 km, spilling out of the mountains near Khashuri. It then arcs east before flowing east-southeast for about 120 km, past Gori, then near Mtskheta, flows south through a short canyon and along the west side of Tbilisi. The river flows steeply southeast past Rustavi and turns eastward at its confluence with the Khrami, crossing the Georgia-Azerbaijan border and flowing across grasslands into the Shamkir reservoir and then Yenikend reservoir. The Kur then empties into the Mingachevir reservoir, the largest body of water in Azerbaijan, formed by a dam near its namesake town at the southeastern end. The rivers Iori (also known as Qabirri) and Alazani formerly joined the Kura, but their mouths are now submerged under the lake. After leaving the dam, the river meanders southeast where it meets its biggest tributary, the Tartarchay, in Barda District and continues across a broad irrigated plain for several hundred km, turning east near Lake Sarysu, and shortly after, receives the Aras, the largest tributary, at the city of Sabirabad. At the Aras confluence, it makes a large arc to the north and then flows almost due south for about 60 km, passing the west side of Shirvan National Park, before turning east and emptying into the Caspian Sea at Neftchala.

The Kura's basin covers an area of approximately 188,000 km2. Most of the Kur runs in the broad and deep valley between the Greater and Lesser Caucasus Mountains, and the major tributary, the Aras, drains most of the southern Caucasus and the mountain ranges of the extreme northern Middle East. The entirety of Armenia and most of Azerbaijan are drained by the river. Most of the elevation change in the river occurs within the first 200 km. While the river starts at 2,740 meters above sea level (ASL), the elevation reaches only 291 meters ASL when it reaches Azerbaijan. The lower part of the river flows through the Kura-Aras Lowland, which covers most of central Azerbaijan and abuts the Caspian Sea. The Kur is the third largest, after the Volga and Ural, of the rivers that flow into the Caspian. Its delta is the fourth largest among the rivers that flow into the Caspian Sea and is divided into three main sections, or "sleeves", composed of sediment the river deposited during different periods.

About 174 km of the river is in Turkey, 435 km in Georgia, and 906 km in Azerbaijan. About 5,500 km2 of the catchment is in Turkey, 29,743 km2 in Armenia, 46,237 km2 in Georgia, 56,290 km2 in Azerbaijan, and about 63,500 km2 are in Iran. At the confluence with the Aras River, the drainage area of the tributary is actually larger than the Kur by about 4%, and it is also longer. However, because of the more arid conditions and equally intensive water use, the discharge of the Aras is much less than the Kura, so downstream of the confluence, the river is still called Kura. About 52% of the river's flow comes from snowmelt and glaciers, 30% comes from groundwater seepage, and roughly 18% from precipitation. Because of high water use, many of the smaller tributaries of the Kur no longer reach the river, instead disappearing in the plain many km from their original mouths.

The Kur River's hydrology is characterized by high variability in discharge, with peak flows occurring in spring and early summer due to snowmelt and rainfall. The river experiences relatively low flows in autumn and winter. The average annual discharge of the Kur River at its mouth is estimated to be around 575 m3/sec.

Several dams and reservoirs have been constructed on the Kur River and its tributaries for hydropower generation, irrigation, and flood control. The largest of these is the Mingachevir Reservoir in Azerbaijan, which has a storage capacity of 16.1 km3. These dams have significantly altered the river's flow regime, reducing peak flows and increasing low flows.

The Kur River's water quality is a major concern due to pollution from industrial and agricultural activities. The river is also affected by salinization due to the intrusion of saltwater from the Caspian Sea. Efforts are underway to improve the river's water quality through pollution control measures and the restoration of riparian habitats.

2. Kurakchay. Being a right-bank tributary of the Kur River, Kurakchay rises on the northeastern slope of the Murovdagh range from the confluence of Ilkhidara, Omarchay and Banovshalichay rivers, and flows into Kur river downstream of Mingachevir reservoir. The river is 126 km long with the catchment basin area of 2080 km2. Kurakchay receives 12 tributaries, 6 tributaries from each bank. Average width of the river basin is 16.5 km, average height is 797 m. General slope of the river is 3082 m, average gradient is 42.57%. Average annual flow is 2.86 m3sec.

The river is primarily fed by snowmelt and rainfall. The snowmelt from the Lesser Caucasus mountains contributes significantly to the river's flow during spring and early summer. The rainfall patterns also influence the river's level, with increased flow during wetter periods. The river experiences distinct

seasonal variations in its flow. Spring and early summer see peak flows due to snowmelt, while late summer and autumn are characterized by lower flows. Winter flows are typically the lowest. The semi-arid climate of the region plays a role in the river's regime. Limited rainfall and high evaporation rates result in reduced flows during drier periods.: Human activities such as irrigation and water abstraction for various purposes can also affect the river's flow regime, particularly during periods of low flow. Kurakchay and its tributaries provide important habitats for various aquatic species and contribute to the overall ecological balance of the region.

3. Alijanchay. Left tributary of the Kur River. It flows through the Oghuz, Sheki and Yevlakh districts, and the territory of Mingachevir town. The river is 98 km long and the area of its' basin is 1010 km². Alijanchay is formed by the confluence of the Oghuzchay, Dashagilchay and Khalkhalchay rivers.

The Alijanchay River system comprises ten branches exceeding 5 km in length, with four left-bank and six right-bank tributaries. The river's average gradient is 35.6%, and the river network density is 0.47 km/km². The hydrological regime of Alijanchay is influenced by the feeding patterns of the Khalkhalchay and Oguz rivers, as well as groundwater discharge in the Havtaran valley. The main branch is considered to be the Khalkhalchay River, rising from the southern slope of the Greater Caucasus mountains (3500 m). 60% of the river flow is formed by groundwater, 23% by rainfall, and 17% by snowmelt.

The Alijanchay River exhibits an average annual discharge of 3.93 m³/sec, with a seasonal distribution of 34% in spring, 18% in summer, 25% in autumn, and 23% in winter. Peak flows occur from late March to June, driven by spring snowmelt and rainfall, which can lead to flood events. Conversely, the lowest water levels are typically observed in July and August, although this period may be punctuated by heavy rainfall. The primary flood seasons are spring, due to snowmelt, and autumn, due to sustained rainfall. During intense rainfall events, river flows can surge to 10-15 times the average annual discharge. The Alijanchay carries an average suspended sediment load of 2.56 kg/sec and exhibits an average turbidity of 650 g/m³. The river's water chemistry is classified as hydrocarbonate-calcium, with an average mineralization of 150-500 mg/l. Upon reaching the Shirvan lowland, the river diverges into numerous distributary channels.

The waters of the Alijanchay River are actively utilized for irrigation, with consumption reaching 8-10% of the annual flow during the peak irrigation period of July and August. To further support agricultural needs, a reservoir is planned for construction in the mountain pass of the Dashyuz ridge, located on the border of the Sheki and Oghuz districts. The reservoir will serve to irrigate approximately 16,000 hectares of lowland areas and will boast a total capacity of 77.5 million m³, a usable capacity of 70 million m³, and a dam height of 46 meters.

4. Turyanchay. Significant left-bank tributary of the Kur River, formed by the confluence of the Tikanlichay, Agchay (Galachay), Bumchay, and Demiraparanchay Rivers. The Tikanlichay, originating at an elevation of 3680 meters on the southwestern slopes of Mount Bazarduzu, is considered the main source. The Turyanchay flows 180 km through the districts of Gabala, Aghdash, Ujar, and Zardab, encompassing a basin area of 4840 km².

The river's flow is primarily derived from groundwater (61%), supplemented by snowmelt (18%) and rainwater (21%). Peak flows occur during spring and summer due to snowmelt, and in autumn due to increased rainfall. The period from April to July accounts for 50-60% of the annual flow, while January

experiences the lowest flows. The average annual discharge is 15.8 cubic meters per second, with 30% occurring in spring, 25% in summer, 24% in autumn, and 21% in winter.

The Turyanchay is notable for its high sediment load, averaging 49.7 kg/s, which translates to approximately 2 million tons of sediment deposited annually on the Shirvan plain. This amount can increase significantly during periods of heavy rainfall. Below the Bozdag range, the river branches into numerous channels, with water diverted for extensive irrigation of agricultural lands in the Ujar, Aghdash, and Zardab districts.

The upper basin, above 2500 meters, lacks forest cover and is characterized by steep, fragmented slopes. The basin contains a 4.2 km² glacier and a total of 445 km² of forested area. The river's average gradient is 20.5%, and its network density is 0.50 km/km². It has 10 tributaries exceeding 15 km in length, only two of which are left-bank tributaries.

The Turyanchay experiences a spring-summer flood regime, with occasional autumnal flooding. Flash floods can occur in its tributaries, particularly the Akhchay (Galachay), Bumchay, Tikanlichay, and Demiraparanchay Rivers. The high-water period extends from March to late June, sometimes into mid-July. A low-water phase occurs in July and August, punctuated by rain-induced floods. Autumn floods typically occur from September to November, followed by a stable low-flow regime from December to February.

5. Goychay. Left-bank tributary of Kur. Spanning 115 km with a basin area of 1770 km², Goychay originates in the southern slopes of the Greater Caucasus (1980 m) and flows through Gabala, Ismayilli, Goychay and Ujar districts, flowing into the Kur through an artificial canal. Goychay stands out as the river with the highest water volume among those flowing from the southern slopes.

The river’s basin has an average width of 15.4 km and an average elevation of 538 m. The basin's forest cover extends over an area of 510 km². The river has an average slope of 17.2% and a river network density of 0.48 km/km². Ten main tributaries, each exceeding 5 km in length, feed the Goychay, with two on the left bank and eight on the right. Main tributaries of the river are Galachay (18 km) and Vandamchay (36 km) on the right, and the Ayrichay (36 km) on the left. The upper reaches of the river feature exposed rocky areas prone to intensive erosion.

The average annual water flow is 12.0 m3/sec, with 30-35% occurring in spring, 20-25% in summer, 18-22% in autumn, and 15-17% in winter. Hydrological regime of the river is characterized by spring and autumn floods. In middle reaches, the flood period commences on March 10th and concludes on June 28th, lasting an average of 140 days. In the downstream near Goychay city, the flood season begins on March 9th and ends on June 30th, spanning 128 days. The river's upper reaches are primarily nourished by snowmelt and rainwater, while downstream, near Goychay city, groundwater contributes 42% of the annual flow volume, with snow and rainwater accounting for the remaining 58%. The Goychay River has an average perennial water flow of 12.8 m³/s, with a coefficient of variation of 0.18. The highest recorded water flow occurred on July 7, 1963, reaching 489 m³/s, calculated based on flood marks.

The water in the Goychay River has got primarily hydrocarbonate composition, with a mineralization level ranging from 300-400 mg/l. The mineralization varies along the river's course, with the upper reaches exhibiting a range of 170-380 mg/l and the lower reaches showing a higher range of 280-480 mg/l. The

Goychay River serves as a crucial source of irrigation for the Haftaran valley and the Shirvan lowland. The river water also supplies the city of Goychay. The river has experienced several flash floods throughout history of observations.

6. Girdimanchay. Left-bank tributary of Kur. The river is 88 km long, encompassing a basin area of 727 square km. Originating 1 km southeast of the Babadağ pass at an elevation of 2900 meters ASL. Upon descending from the mountain range, the river forms a broad alluvial fan on the Garamaryam plateau, where it diverges into multiple branches. Traversing this plateau, the river reaches the Shirvan plain with six tributaries. Main streamway of Girdimanchay flows into the Kur River via an artificial canal. Following the Garamaryam Plateau, the Girdimanchay River diverges into several branches: the westernmost being Kurd-Gobu, followed by Dalychay, and the central branch retaining the name Girdimanchay. The fourth and sixth branches remain unnamed, while the fifth is known as Quba. These branches collectively form a secondary alluvial fan upon traversing the plateau. The central branch merges with Dalychay, terminating at an elevation of 15 m.

Historically, in the 1950s and 1960s, the Girdimanchay and Akhsuchay rivers were artificially connected, resulting in a single channel flowing into the Kur River. The Girdimanchay River basin exhibits an average width of 8.3 km and an average elevation of 1212 m. The basin is characterized by significant landslide activity and encompasses a forested area of 64 km². The average river gradient is 32‰, and the river network density is 0.48 km/km². Hydrologically, the Girdimanchay is classified as a river with spring and autumn flooding. The frequent occurrence of floods poses a significant hazard, with flood sources encompassing over 50% of the basin.

Annual flow of the river is built by snowmelt (24%), rainfall (39%), and groundwater (37%). The mean annual water discharge is 4.20 m3/sec. The flow is distributed as follows: 36% in spring, 25% in summer, 24% in autumn, and 15% in winter. During the peak irrigation period of July and August, the flow accounts for 15% of the annual total. The highest water levels occur during the spring-summer flood period, with discharge reaching 15-20 times the average annual discharge. The lowest water levels (4-6%) are observed in January and February. The river's suspended sediment discharge is 10.6 kg/sec, and the average turbidity is 2500 g/m3.

The water is classified as sulfate-sodium type, with mineralization ranging from 500 to 1000 mg/l and an average mineralization of 560 mg/l.

After reaching the Garamaryam plateau, the river’s stream splits into several branches as it descends onto the Shirvan plain, where its waters are extensively utilized for irrigating agricultural fields. The river is prone to frequent and powerful flash floods.

7. Aghsuchay. Left-bank tributary of the Kur River. Aghsuchay flows through the Shamakhi, Aghsu, and Kurdamir districts before joining the Kur via an artificial canal. The river is 85 km long with a basin area of 572 km². Originating from numerous springs on Saribulaq Mountain (2268m) in the Greater Caucasus range, it is known as Sulutchay in its upper reaches. The river is primarily fed by groundwater (67%), with additional contributions from snowmelt (20%) and rainfall (13%). The snowmelt in spring and rainfall in autumn often lead to floods. The average width of the basin is 6.7 km, the average height is 666 m. The forest in the basin covers an area of 130 km². The average gradient of the river is 24.7%, and the density of the river network is 0.46 km/km².The average annual water flow of the river is 1.7 m³/s, with an average

annual suspended sediment discharge of 3.08 kg/s and an average turbidity of 2000 g/m³. The water is classified as calcium bicarbonate, with a mineralization of 500-700 mg/l. Aghsuchay serves as a vital source for irrigation and replenishes the Javanshir Reservoir.

8. Pirsaatchay. Part of Caspian Sea basin. Pirsaatchay flows through the Ismailli, Shamakhi, and Salyan districts and discharges into the Caspian Sea near the village Khidirli. The river spans 119 km, with a basin area of 2280 km2. It originates from the southern slopes of the Greater Caucasus Mountains at an elevation of 2400 meters. The majority of its flow is derived from rainfall (80%), with partial contributions from snowmelt (14%) and groundwater (16%). Annual precipitation often leads to flooding events. The average annual water discharge is 1.55 cubic meters per second, with 60-70% of the annual flow occurring during the spring and summer seasons. The water is characterized by high mineralization, exceeding 1000 mg/l, and is classified as sulfate-sodium type. A reservoir has been constructed on the river.

6.6.2. Irrigation canals

Along its' extension, the corridor of "Azerbaijan TPP - Navahi SS" OHL cross the streamways of two irrigation systems, namely Mil-Garabagh collector and Upper Shirvan canal. Brief description of the systems is given below.

1. Mil-Garabagh collector (MGC) is an extensive collector-drainage system constructed in the Mil-Garabakh lowland between 1957 and 1965. Its primary function is to divert drainage water from reclaimed and developed irrigated lands in the region, covering approximately 155,000 hectares. Originally spanning 152 km with an estimated discharge of 25 cubic meters per second, the MGC underwent reconstruction and was later connected to the Main Mil-Mugan Collector. The water collected in the MGC is often highly mineralized and saline, but has potential for use in irrigation after proper treatment and management.

2. Upper Shirvan canal (USC). Built in 1954-1958, the canal receives water from the headworks at the Khanabad dam, with the canal bed elevation at the intake point being 65.33 meters. The canal irrigates agricultural lands and the Shirvan winter pastures in the Yevlakh, Aghdash, Goychay, Zardab, Aghsu, Kurdamir, Shamakhi, and Hajigabul districts. The canal has a length of 123.5 km and a flow rate of 78 m3/sec. To protect the section of the canal running along the southern part of the mountain range from floodwaters, an 80.52 km long foothill canal was built along its left bank to allow for unimpeded water flow. At the intersections of the USC with the Alijanchay, Turyanchay, Goychay, Girdimanchay, and its tributary Davabatanchay rivers, 6 culverts were constructed, while 2 aqueducts were built at the intersections with the Aghsuchay and Nazrichay rivers, and a rapid flow structure was built near the village of Potu. To address low water levels in the Turyanchay, Goychay, and Girdimanchay rivers during summer or in case of emergencies, sluices with a capacity of 15-20 cubic meters per second were installed at the entrance of the culverts to allow for canal drainage.

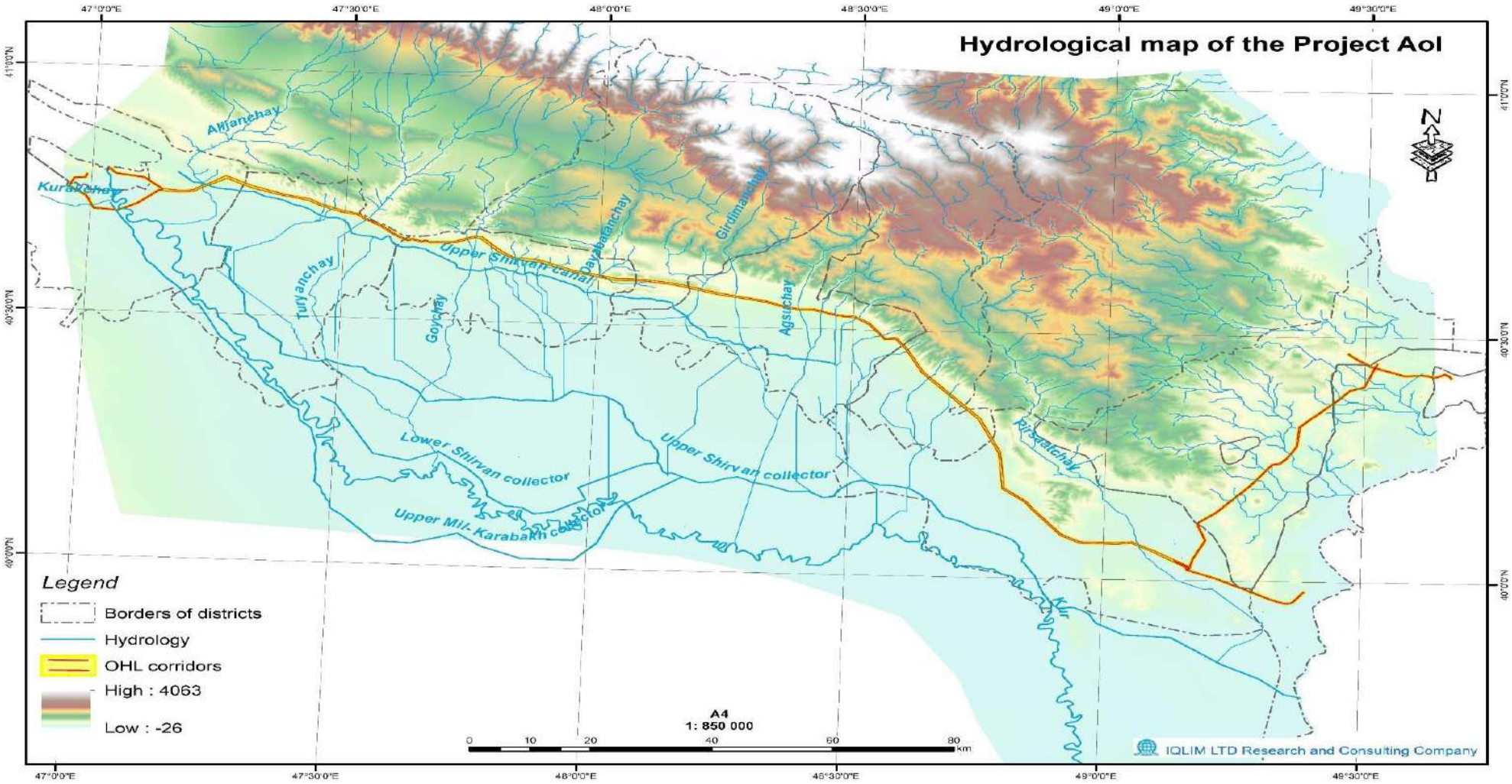


Figure 6.18: Hydroligical map of the Project AoI

6.6.3. Water quality

The EBS field investigation program included measuring physical parameters and collection of water samples from the surface water resources of the Project AoI. The onetime Investigations were implemented on the following 10 locations:

WQ 1 Kurakchay river, 0.3 km to the west of Huruushaghi village

WQ 2 Kur river, 4 km to the southwest of Huruushaghi village

WQ 3 Alijanchay, 1.3 km to the north of Yukhari Bujag village, 2 km to the north of Arabbasra village

WQ 4 Upper Shirvan canal, 2 km to the south of Shilyan village, 2 km to the northeast of Arabbasra village

WQ 5 Turyanchay river, 0.2 km to the north of Turyanchay village

WQ 6 Goychay river, northeastern suburbs of Goychay town

WQ 7 Davabatanchay river, 1.5 km to the southwest of Garamaryam settlement

WQ 8 Girdimanchay river, 2.6 km to the southwest of Padar village

WQ 9 Aghsuchay river, 1 km to the southeast of Ulguj village, 1.5 km to the northwest of Arabushaghi village

WQ 10 Pirsaatchay river, 0.7 km to the south of Ranjbar village

Location map of the measurement and sampling spots is provided in Figure 6.20. Physical parameters of the measured water sources are provided in Table 6.2 below.

Collected water samples were analysed in the certified laboratory. According to the laboratory testing results, all samples were characterized by increased water turbidity. Samples collected from Aghsuchay (WQ9) and Pirsaatchay (WQ10) both had increased TDS levels, while the sample collected from Pirsaatchay demonstrated increased sulphate content. Finally, it was identified that the water temperatures were above-normal in Kur (WQ2), Upper Shirvan canal (WQ4), Davabatanchay (WQ7), Girdimanchay (WQ8) and Pirsaatchay (WQ10).

Detailed analysis results are provided in the Annex 1.

Table 6.3. Physical parameters of surface water sources of the Project AoI

#	Station ID	Coordinates		Date	Time	DO	Temp.	Turb.	Eh/re. poten	pH	TDS	Conduct.
						mg/l	˚C	ntu	mV		mg/l	µS/cm
1	WQ1 (Kurakchay)	40°42'48.46"	47° 0'18.51"	26.07.24	09:00	9.7	19.5	45.47	-64.2	8.17	265	531
2	WQ2 (Kur)	40°42'27.60"	47° 3'56.33"	25.07.24	09:00	9.5	20.6	3.25	-93.5	8.64	632	1270
3	WQ3 (Alijanchay)	40°45'19.09"	47°13'3.85"	26.07.24	09:40	8.3	17.2	>999.00	-52.3	7.95	321	645
4	WQ4 (Upper Shirvan canal)	40°45'39.00"	47°13'42.93"	26.07.24	10:00	10.2	22.1	10.31	-59.9	8.03	490	980
5	WQ5 (Turyanchay)	40°42'2.82"	47°32'46.26"	25.07.24	10:00	8.6	18.6	>999.00	-41.1	7.75	423	850
6	WQ6 (Goychay)	40°40'5.71"	47°45'40.77"	25.07.24	11:30	8.2	19.3	>999.00	-73.8	8.28	386	775
7	WQ7 (Davabatanchay)	40°35'51.94"	47°59'56.12"	26.07.24	11:40	10.1	22.7	77.21	-36.4	7.67	377	755
8	WQ8 (Girdimanchay)	40°34'40.20"	48°11'57.15"	26.07.24	12:00	9.3	23.5	73.05	-56.3	7.99	335	670
9	WQ9 (Aghsuchay)	40°32'28.80"	48°23'47.57"	25.07.24	13:00	10.2	19.1	>999.00	-9.6	7.16	552	1105
10	WQ10 (Pirsaatchay)	40° 4'31.00"	49° 3'43.19"	25.07.24	15:00	8.9	25.8	94.56	3.4	6.94	1145	2298

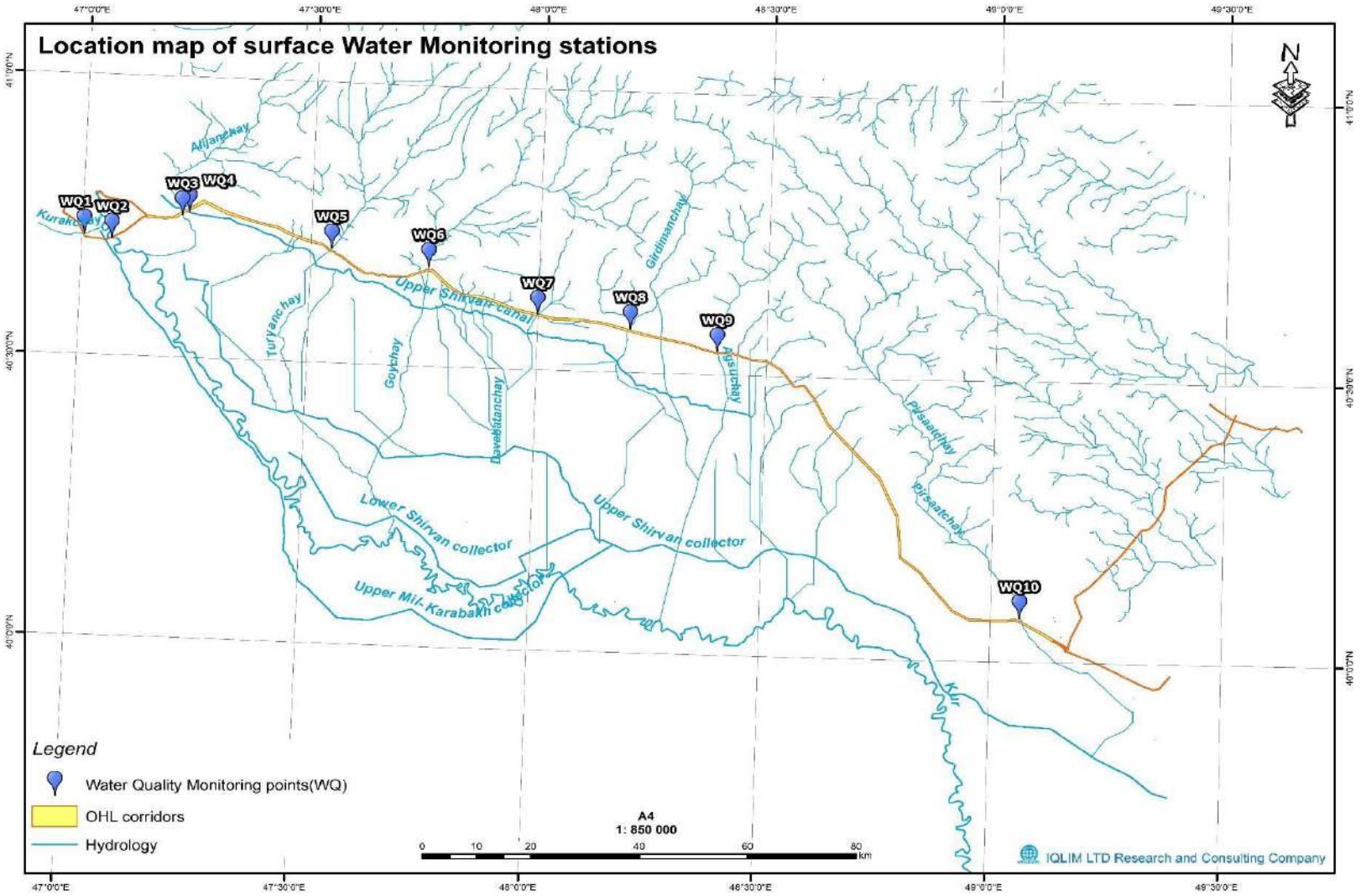


Figure 6.19: Map of water sampling locations

6.6.4. Water use

A. Shirvan lowland and ridges

Absolute majority of the surface water resources of the Shirvan lowland are consumed by agricultural facilities and local populations of the Project affected and other districts of the Kur-Araz lowlands. Thus, the Shirvan Lowland, being a predominantly agricultural region, has a high water consumption rate, primarily driven by irrigation needs. While precise figures are hard to come by due to the dynamic nature of water use and data availability, some estimates can be made based on available information.

- Irrigation: The vast majority of water consumed in the Shirvan Lowland is used for irrigation. The region's extensive network of canals and reservoirs, including the Upper Shirvan canal described above, draws water primarily from the Kur River and the Mingechevir reservoir. The crops grown, such as cotton, alfalfa, and various vegetables, have high water demands, especially during the hot summer months.
- Domestic and industrial use: While domestic and industrial water consumption is significantly lower than irrigation, it still contributes to the overall water demand. The growing population of Mingachevir, Yevlakh and other large and small towns of the area, as well as expanding industries in the region are gradually increasing this demand.

Water consumption in the Shirvan Lowland fluctuates significantly throughout the year, peaking during the summer irrigation season. This makes water management a complex task, requiring careful planning and allocation of resources. The high volumes of consumption, especially for irrigation, has led to environmental concerns such as declining groundwater levels, soil salinity, and water pollution. These issues pose a threat to the long-term sustainability of agriculture and the overall ecological balance of the Study area. Recognizing the challenges, efforts are underway to promote sustainable water management practices in the region, such as modernization of irrigation systems to improve efficiency and reduce water wastage, introduction of water-saving technologies (the use of drip irrigation and other technologies that optimize water use in agriculture), and promoting crop diversification (shifting towards less water-intensive crops to reduce the overall irrigation demand).

B. Eastern Gobustan

Gobustan, being the least water-abundant region in Azerbaijan, has relatively low water consumption compared to more agriculturally intensive areas. However, water scarcity and efficient utilization are still important concerns.

The primary source of water consumption in Gobustan is domestic use for households, businesses, and public facilities. Due to the arid climate, water conservation is encouraged among residents. While agriculture is less widespread compared to other regions, some water is used for irrigation in Gobustan, primarily for small-scale farming and livestock watering. Industrial water consumption is high in Greater Baku area, but limited in the Project affected eastern part of Gobustan, with some water used by industries such as mining and quarrying.

Gobustan faces water scarcity due to low precipitation and limited surface water sources. Groundwater resources are also vulnerable to over-extraction and pollution. The existing water infrastructure in Gobustan may require upgrades and expansion to meet the growing demand and ensure reliable water supply to all residents. The changing climate, with increasing temperatures and unpredictable rainfall patterns, poses a threat to water availability and may exacerbate existing water scarcity issues.

Over the last decade GoA has initiated a programme to improve water supply of the Gobustan region. Thus in 2017, President Ilham Aliyev inaugurated a new drinking water supply and sewage system project in Gobustan. This project aimed to improve access to clean water and promote efficient water use in the region[27]. By focusing on sustainable water management practices, Gobustan can address its water challenges and ensure a reliable and secure water future for its residents.

6.7. Meteorology and climate

6.7.1. Climate of Study Area

General climate characteristics. Part of the study area that corresponds to the northern edge of the Shirvan lowland, experiences a semi-arid climate characterized by hot dry summers, mild winters with occasional cold spells, and generally low precipitation with most of the rainfall occurring in the spring and autumn.

Part of the study area confined to the hilly landscapes of Gobustan, has a different climate compared to the Shirvan lowland. While it is still considered semi-arid, it experiences a slightly milder and more humid climate due to its higher elevation and proximity to the Caspian Sea. The climate of Gobustan is characterized by still hot, but not as scorching summers as in the Shirvan lowland. The winters are mild with temperatures rarely dropping below freezing. Finally, the region is characterized by higher precipitation with rain falling mainly in spring and autumn. This is due to its proximity to the Caspian Sea and the influence of moist air masses.

Solar radiation. The entire EBS coverage area receives a high annual average amount of sunshine. According to the Agroclimatic Atlas of Azerbaijan (1993), most of the area experiences approximately 2,200 hours of sunshine per year. Roughly 60% of this occurs between June and August, with Greater Baku area and Absheron district, for example, receiving up to 11 hours of sunshine per day. In winter, the average decreases to 3 hours. Annual mean solar radiation varies within the range of 128-132 kcal/cm² along all OHL corridors, normally reaching their maximum levels in the areas close to Absheron-Garadagh WPP.

Air Temperature. The abundance of solar energy, combined with the region's characteristic lack of shade-providing vegetation (especially in the eastern semi-desert), results in high air and soil temperatures, particularly in mid-summer. The average annual air temperature gradually increases eastward. In the

27 https://www.sukanal.az/en/news-51/

vicinities of Mingachevir city, it is approximately 17.5°C, reducing to 14°C in the piedmont parts of the Shirvan lowland, and making up 14.5°C in the Gobustan area. January is typically the coldest month, while July and August are the warmest.

Winter temperatures in the Shirvan lowland are generally mild, rarely dropping below freezing. The average temperature during the winter months (December-February) ranges from 2°C to 8°C. However, there can be occasional cold spells with temperatures dipping slightly below 0°C. These cold spells are usually short-lived and do not result in significant snowfall or lasting frost. The mild winters in the Shirvan lowland are due to its location in a sheltered valley surrounded by mountains, which protect it from the cold winds blowing from the north. Additionally, the Caspian Sea, which borders the lowland to the east, has a moderating effect on temperatures, preventing them from falling too low. Gobustan experiences slightly cooler winters compared to the Shirvan lowland due to its higher elevation. The average winter temperature ranges from 2°C to 5°C. However, similar to the Shirvan lowland, the winters in Gobustan are generally mild, with occasional cold spells that can bring temperatures below freezing. In the Shirvan lowland, the lowest recorded temperature is -10°C. However, such extreme cold is rare and usually short-lived. In most winters, the lowest temperatures typically range between -2°C to -5°C. The lowest recorded temperature in Gobustan is -13°C. However, similar to the Shirvan lowland, extreme cold spells are infrequent. In most winters, the lowest temperatures range between -3°C to -6°C.

Summer temperatures. Average summer temperatures of the study area vary from 25-35°C in the Shirvan lowland to 20-30°C in Gobustan region. Extreme highs are frequently recorded in July and August, exceeding 40°C in the Shirvan lowland and 35°C in Gobustan. Overall, summers in both regions are hot, but the Shirvan lowland experiences more intense and prolonged heatwaves with lower humidity, while Gobustan has a slightly milder summer climate with somewhat higher humidity.

Humidity and precipitation. The humidity regime in both the Shirvan lowland and Gobustan is characterized by low to moderate humidity levels throughout the year. However, there are some variations between the two regions and across seasons.

The Shirvan lowland experiences a predominantly dry climate with low humidity levels throughout the year, which is due to its inland location and distance from major water bodies. Humidity levels are particularly low during the summer months, exacerbating the already hot temperatures. The Shirvan lowland has a minimal cloud cover, ranging, on average, from 20% to 40% throughout the year, with the lowest values registered during the summer months. The average annual relative humidity in the Shirvan plain ranges from 50% to 70%. However, there are seasonal variations. Thus, the humidity is lowest during the summer months, often dipping below 40% in the peak of the hot and dry season. Humidity levels increase during winter, reaching 70-80% or higher due to the cooler temperatures and decreased evaporation. Humidity levels are moderate during these transitional seasons, usually falling between the summer and winter extremes. The average annual rainfall in the Shirvan lowland ranges from 200-350 mm.

Gobustan generally has slightly higher humidity levels than the Shirvan lowland due to its proximity to the Caspian Sea. However, humidity levels are still considered moderate to low overall. While humidity can increase slightly during the summer months, it is not as significant as in more humid climates. Located closer to the Caspian Sea, Gobustan region experiences slightly higher cloud cover compared to the Shirvan lowland, averaging at 30-50% throughout the year, with slightly higher cloud cover during the winter months due to increased moisture from the sea. The average annual relative humidity in Gobustan is around 60-70%. This means the air holds 60-70% of the maximum amount of moisture it could hold at a given temperature. Humidity is lowest during the summer months, often dropping below 50% during the hottest part of the day. This is due to the high temperatures and low precipitation. Humidity levels increase during the winter months, reaching 70-80% or higher. This is due to the cooler temperatures and increased moisture in the air. Spring and Autumn: Humidity levels are moderate during these transitional seasons, falling between the summer and winter extremes. Relative humidity also fluctuates throughout the day, typically being highest in the morning and lowest in the afternoon. This is because the air cools overnight, allowing it to hold more moisture, while the daytime heat causes evaporation, reducing the amount of moisture in the air. The average annual rainfall in Gobustan ranges from 200-300 mm.

Snowfall in both the Shirvan lowland and Gobustan is relatively rare and light due to their semi-arid climate and mild winters. However, occasional snowfall can occur, especially in the higher elevations of Gobustan and during particularly cold winters. In Shirvan lowland, the snowfall is infrequent and usually light, with only a few days of snow per year. The snow typically melts quickly due to the relatively warm temperatures. In Gobustan, it is more common than in the Shirvan lowland due to the region's higher elevation. However, it is still relatively infrequent and light. Snow accumulation can be slightly higher in Gobustan compared to the Shirvan lowland, especially in the higher elevations. However, the snow usually melts quickly due to the mild winter temperatures.

Winds. The Shirvan lowland and Gobustan both experience varying wind regimes due to their geographical locations and the influence of the Caspian Sea.

Shirvan Lowland. The dominant winds in the Shirvan lowland are northwesterly and southerly. These winds are often dry and can carry dust during the summer months. Spring and autumn seasons are characterized by moderate winds, with occasional stronger gusts during transitional weather patterns. Summers experience stronger winds, particularly the dry northwesterly winds, which can contribute to the arid conditions. Winter winds are generally weaker, but cold air masses from the north can occasionally bring stronger, colder winds.

The Shirvan lowland generally experiences moderate wind speeds throughout the year. However, due to its vast expanse and varying terrain, wind speeds can differ slightly depending on the specific location within the lowland. On average, wind speeds in the lowland range from 3 m/s to 5 m/s. However, during certain seasons or weather events, wind speeds can exceed these averages. Seasonal average wind speeds make up 3-5 m/s in spring, 4-6 m/s in summer, 3-5 m/s in autumn and 2-4 m/s in winter.

Gobustan. The wind regime in Gobustan is influenced by both the Caspian Sea and the surrounding mountains. The predominant winds are northwesterly, southerly, and easterly. Spring and autumn seasons experience moderate winds from various directions, with occasional stronger gusts. Summers are characterized by a predominance of the dry northwesterly winds, similar to the Shirvan lowland. Winter winds can be stronger and colder due to the influence of cold air masses from the north. However, the Caspian Sea can also moderate the winds to some extent. Gobustan, alike the eastern part of the Shirvan lowland, is occasionally affected by the "Khazri" winds, strong, cold, and dry northerly winds that blow across the Caspian Sea. These winds can occur during any season but are most common in winter and spring. Khazri winds can cause significant temperature drops. Gobustan, similar to the Shirvan lowland, experiences moderate wind speeds throughout the year. However, due to its higher elevation and proximity to the Caspian Sea, wind speeds in Gobustan can be slightly stronger and more variable. The average wind speed in Gobustan ranges from 4 m/s to 6 m/s depending on seasons and the specific location within Gobustan. Average wind speeds make up 4-6 m/s in spring, 5-7 m/s in summer when the dry "Khazri" winds are more pronounced, 4-6 m/s in autumn and 3-5 m/s in winter.

6.7.2. Climate Change

The share of the Azerbaijan in global climate change

GoA ratified the United Nations Framework Convention on Climate Change on January 10, 1995. Azerbaijan is one of the countries not included in Annex I to the Convention.

Climate change is an important issue for Azerbaijan due to worsening droughts, water shortages and soil degradation, and changes in the level of the Caspian Sea. The region is already experiencing the impact of climate change on nature and people. The region currently experiences unsustainable use of natural resources, significant land degradation (due to overgrazing, soil pollution and erosion), deforestation and lack of access to safe drinking water in some areas. Expected climate changes, such as rising temperatures, decreasing water availability, and increasing frequency and magnitude of extreme events, will exacerbate these problems and hamper the region's development. Integrating climate change into development goals will help reduce some of these impacts.

Some work has been done to address the problem of climate change in Azerbaijan and the South Caucasus region. Azerbaijan, as a transition (non-Annex 1) country, has submitted four national communications under the United Nations Framework Convention on Climate Change, and several agricultural policies focus on adaptation and mitigation priorities in the agricultural sector.

The Azerbaijan's share in global warming has historically been insignificant. In 2016, greenhouse gas emissions in the country were estimated at 61.257 million tons of CO2 equivalent, and net emissions, including removals, were estimated at 54.033 million tons of CO2 equivalent, representing only 0.15% of estimated emissions. in the world in 2016. Per capita emissions in Azerbaijan amounted to 6.3 tons of CO2e, and net emissions, including removals, amounted to 5.6 tons of CO2e. For comparison, in 2016 the average global emissions (absorption) per capita was 6 tons CO2e, and in developed countries such as Germany and Austria, for example, these figures were 9.79 tons and 7.74 tons CO2e respectively.

According to the greenhouse gas inventory for 1990-2016, in 2016 Azerbaijan reduced greenhouse gas emissions by 23.2% compared to the base year (1990). These reductions are mainly due to the economic downturn in 1990-2000. Although these reductions in the Fourth Report are presented as reductions in emissions due to energy conservation measures. Additionally, total greenhouse gas emissions in the latest report are inconsistent with previous reports and are grossly overestimated.

The base year for the Azerbaijan was 1990, and the total greenhouse gas emissions were assumed to be 69.6 million tons. According to National Reports[28] and according to the State Statistics Committee29, total GHG emissions by main economic categories are presented in Table 6.3 below.

Table 6.4. GHG emissions and absorptions by sectors, Million tons CO2-equiv.

Sector	1990*	2000*	2005*	2010**	2011**	2012**	2013**	2014**	2015**	2016**	2017***	2018***	2019***	2020***	2021***
	Emissions														
Energy	63,9	33,0	39,2	38,6	35,7	42,5	37,2	36,6	37,4	39,3	47,4	47,5	49,0	49,8	53,4
Industry	1,45	5,54	1,78	1,99	2,30	2,04	1,78	2,11	2,88	3,02	3,2	3,4	3,3	3,2	3,3
Agriculture	6,26	5,37	6,47	6,69	7,00	7,18	7,27	7,24	7,10	7,03	8,7	8,7	8,0	8,0	7,6
Wastes	1,69	1,84	2,02	2,08	2,13	2,18	2,20	2,26	2,45	2,48	1,3	1,3	1,4	1,4	1,5
Total	73,3	40,8	49,5	49,4	47,1	53,9	48,4	48,2	49,8	51,9	60,6	60,9	61,7	62,4	65,8
	Absorption														
Forestry	-3,69	-4,87	-5,35	-5,35	-5,44	-5,38	-5,36	-5,41	-5,44	-5,44	-7,20	-7,2	-7,5	-8,5	-7,7
Netto	69,6	35,9	44,1	44,0	41,7	48,6	43,1	42,8	44,4	46,4	53,4	53,7	54,2	61,0	58,1

- *Initial National Communication to the United Nations Framework Convention on Climate Change. 2000
- **Second National Communication to the United Nations Framework Convention on Climate Change.2010.
- ***Third National Communication to the United Nations Framework Convention on Climate Change.2015.

28 https://unfccc.int/gcse?q=INITIAL%20NATIONAL%20COMMUNICATION%20AZERBAIJAN%20REPUBLIC%20TO%20THE%20UNFCCC

29 https://www.stat.gov.az

- ****Fourth National Communication to the United Nations Framework Convention on Climate Change.2021.
- ***** at 2017 purchasing power parity prices. https://www.stat.gov.az

GHG emission sources of AzerEnerji

AzerEnerji, as the primary electricity generation and distribution company in Azerbaijan, contributes to greenhouse gas emissions mainly through the following sources:

Thermal Power Plants: AzerEnerji operates several thermal power plants that rely on the combustion of fossil fuels (primarily natural gas) to generate electricity. This process releases significant amounts of carbon dioxide (CO2), the most prevalent greenhouse gas.

Combined Heat and Power (CHP) Plants: AzerEnerji also operates CHP plants, which simultaneously produce electricity and heat. While more efficient than separate heat and power generation, these plants still contribute to greenhouse gas emissions through the burning of fossil fuels.

Transmission and Distribution Losses: The transmission and distribution of electricity across the grid involve energy losses, some of which are converted into heat. This indirect energy consumption also contributes to greenhouse gas emissions, albeit to a lesser extent compared to the direct emissions from power plants.

AzerEnerji has taken some steps to reduce its greenhouse gas emissions, such as:

Modernization of Power Plants: Upgrading older power plants with more efficient technologies can help reduce emissions per unit of electricity generated.

Increased Use of Natural Gas: Natural gas emits less CO2 per unit of energy compared to coal or oil. Shifting towards a greater reliance on natural gas can help reduce overall emissions.

Investment in Renewable Energy: AzerEnerji has started investing in renewable energy sources like solar and wind power. While still a small portion of their overall energy mix, expanding renewable energy capacity can significantly reduce emissions in the long run.

Overall, while AzerEnerji's operations inevitably contribute to greenhouse gas emissions, the company is taking steps to reduce its environmental impact. Continued efforts in modernization, renewable energy adoption, and energy efficiency will be crucial for achieving a more sustainable energy future in Azerbaijan.

Construction of 445 MW solar power plant in Bilasuvar district, 315 MW solar power plant in Banka settlement and 240 MW wind power plant in Gobustan district will reduce discharge of about 795,000 tons of carbon emissions into the air and save millions cubic meters of natural gas resources of the country.

6.8. Ambient Air Quality, Noise & Vibration

6.8.1. Existing air emission sources

A. Shirvan lowland and adjoining ridges

The discussed part of the Study area, being a predominantly agricultural region, has specific air emission sources that contribute to air pollution in the Study area.

1. Agriculture:
   - Dust and Particulate Matter: Agricultural practices like ploughing, tilling, and harvesting generate dust and particulate matter, which can be harmful when inhaled.
   - Ammonia Emissions: Livestock farming, particularly cattle and poultry, releases ammonia into the air from animal waste. Ammonia can react with other air pollutants to form fine particulate matter, contributing to smog and respiratory problems.
   - Pesticides and use of fertilizers: The application of pesticides and fertilizers releases volatile organic compounds (VOCs) into the atmosphere, which can react with sunlight to form ground-level ozone, a harmful air pollutant.
2. Industrial activities:
   - Power Plants: The Shirvan Lowland has a few power plants that burn fossil fuels, emitting sulfur dioxide (SO2), nitrogen oxides (NOx), and particulate matter, which contribute to acid rain, smog, and respiratory problems.
   - Oil and Gas Operations: Some oil and gas extraction and processing facilities operate in the region, releasing methane, VOCs, and other pollutants.
3. Transport:
   - Vehicle Emissions: Vehicles in the Shirvan Lowland, particularly older diesel vehicles and those with poorly maintained engines, release NOx, particulate matter, and other pollutants.
   - Other Sources:
   - Dust Storms: The arid climate of the Shirvan Lowland can lead to dust storms, which carry large amounts of particulate matter and can affect air quality over a wide area.
   - Biomass Burning: The burning of agricultural residues and other biomass for heating or land clearing releases smoke, particulate matter, and other pollutants.

B. Eastern Gobustan

The most crucial natural air emission source of the Gobustan area are the active mud volcanoes. The gases emitted from these volcanoes can contain methane, carbon dioxide, and other volatile organic compounds (VOCs). These emissions can contribute to air pollution in the region.

The most crucial manmade air emission source of the area is the oil and gas production sector causing considerable release of the pollutants into the ambient air.

The third key source of emission is transport, effect of which increases considerable on the international highways and in the areas of Greater Baku and Sumgait city.

The other key source category includes various non-oil industrial facilities, concentration of which is quite high in Garadagh district of Greater Baku, as well as in the industrial suburbs of Sumgait and the areas close to the densely populated parts of the Absheron district.

The least developed air emission source is agriculture, the share of which is however higher in the Project AoI. Main agricultural sources of the air emissions are cattle breeding and poultry facilities of the Absheron district.

It is important to note that the specific air emission sources and their relative contributions can vary depending on the specific location within eastern Gobustan and the time of year.

C. Project AoI

Key sources of air emission within 200 m of the centreline of the alignments of the transmission lines and 200 m around the proposed location of the substation - were observed to gain indicative air quality baseline situation. There are no measurements of the ambient air quality within the study area or in wider region. Key air pollution source is the traffic network. Other sources of seasonal air pollution in the environment are the air emissions during heating season (in Mingachevir city) and from agricultural activities. No significant industrial facilities are present in the area. The area is not densely populated and is predominantly rural in nature, with an exemption of the sections of the proposed 500 kV Navahi – Azerbaijan TPP (Sub-project 1.2) through urban zones in Mingachevir where air quality likely exceeds ambient limit values in particular cases.

6.8.2. Air emission sources of AzerEnerji

A. Azerbaijan TPP

Azerbaijan TPP is a major electricity producer in Azerbaijan, and like all thermal power plants, it is a significant source of air emissions. The primary emissions from this plant are:

- **Nitrogen Oxides (NOx):** These are formed during the combustion of fossil fuels at high temperatures. NOx emissions contribute to smog formation and can cause respiratory problems.
- **Sulfur Dioxide (SO2):** This pollutant is released when the sulfur contained in fossil fuels is burned. SO2 can lead to the formation of acid rain and can also irritate the respiratory system.
- **Particulate Matter (PM):** These are tiny particles that can be inhaled and cause respiratory and cardiovascular issues. PM emissions from power plants can contain heavy metals and other harmful substances.

- **Carbon Dioxide (CO2):** This greenhouse gas is a major contributor to climate change. While not directly harmful to human health in the short term, its long-term impacts are significant.

The exact amounts of these emissions can vary depending on the type and quality of fuel used, as well as the plant's operational efficiency and emission control technologies. However, data from NASA's air quality monitoring shows a slight decrease in NO2 emissions from Azerbaijan TPP since 2005.

In addition to these primary pollutants, the plant may also release smaller amounts of other pollutants such as carbon monoxide, volatile organic compounds (VOCs), and mercury.

It's important to note that the environmental impact of these emissions depends not only on their quantity but also on their dispersion and local meteorological conditions. Efforts to reduce emissions from power plants, such as using cleaner fuels and installing pollution control equipment, are crucial for improving air quality and mitigating the impacts of climate change.

B. Mingachevir HPP

As Mingachevir HPP is a hydroelectric power plant, meaning it generates electricity using water, the facility is considered a clean source of energy as it doesn't burn fossil fuels and therefore doesn't not directly release air pollutants like nitrogen oxides, sulfur dioxide, or particulate matter.

However, there can be some minor sources of air emissions associated with hydroelectric power plants, such as:

- Construction and maintenance activities: During the construction and maintenance phases, there might be emissions from vehicles, equipment, and other activities.
- Vegetation decay: In the reservoir created by the dam, decaying vegetation can release methane, a greenhouse gas. However, the emissions from this source are generally much lower than those from fossil fuel-based power plants.

Overall, the air emissions from Mingachevir HPP are negligible compared to the neighboring Azerbaijan TPP.

6.8.3. Onsite air quality monitoring results

Air quality is characterized as an assessment of the atmospheric conditions in relation to the requirements of one or more biotic species or human needs. The air quality parameters that are of interest to this project include those that could potentially impact human health or the environment. These parameters include suspended particulate matter (PM10 and PM2.5, along with larger particle nuisance dust), oxygen (O2), carbon monoxide (CO), carbon dioxide (CO2), hydrogen sulphide (H2S), nitrogen oxides (NO2), and sulfur dioxide (SO2), ozone (O3) and volatile organic contents (VOC). Along with atmospheric gases, radiation background was also measured at each monitoring point.

As part of the field studies, a one-time air quality monitoring was conducted at the following 17 locations within the Project AoI:

AP-1 Mingachevir: pasture area 0.25 km south of Azerbaijan TPP, north of Yeni Hayat settlement

AP-2 Mingachevir: 1 km west of Yeni Hayat settlement, near private farm buildings
AP-3 0.08 km east of Mingachevir highway, private farm at the entrance of Huruushagi village
AP-4 Havarli village: mowing area 1.1 km south of Mingachevir highway
AP-5 Agsham village: private farm 1.4 km north of Khaldan-Mingachevir road
AP-6 Gulovshe village: unused land 0.09 km west of Yevlakh-Zagatala-Georgia highway
AP-7 Turyanchay village: mowing area 0.013 km east of Aghdash-Zaraghan road
AP-8 Arab village: private farm 4 km west of Baku-Shamakhi-Yevlakh highway
AP-9 Goychay town: riverside pasture area 3.7 km north of Baku-Shamakhi-Yevlakh highway
AP-10 Dashdemirbeyli village: pasture area 1.1 km west of Aghsu-Bijo road
AP-11 Gashad village: private farm 0.035 km north of Aghsu-Bijo road
AP-12 Baghirli village: private farm 1.5 km northeast of Aghsu-Bijo road
AP-13 Navahi settlement: pasture area 2.0 km north of Baku-Alat-Gazakh-Georgia highway
AP-14 Qizilburun village: private farm 2.1 km north of Baku-Alat-Gazakh-Georgia highway
AP-15 Mt. Papagdagh: winter pasture 0.4 km south of Sangachal-Jeyildagh road
AP-16 7.5 km west of Sahil-Mushfigabad road
AP-17 Gobu PP area: 3.0 km south of Baku-Shamakhi-Yevlakh highway

Measurements were taken over a period of 1 day (24 hours), during both day and night times, (total 4 times) for 30 minutes at difference times intervals. In total, measurements were taken at 17 monitoring stations over a 4-day period, from July 21 to July 25, 2024. Specifically, 5 stations (AP17-13) were measured on July 21-22, 3 stations (AP12-10) on July 22-23, 3 stations (AP9-7) on July 23-24, and 6 stations (AP6-1) on July 24-25. The data from these measurements were recorded in special protocols. The results of the air quality monitoring are presented in Annex 3.

During the research, the concentrations of oxygen (O2), carbon monoxide (CO), carbon dioxide (CO2), hydrogen sulphide (H2S), nitrogen oxides (NO2), and sulfur dioxide (SO2), ozone (O3) and volatile organic contents (VOC) were measured in milligrams per cubic meter (mg/m3) using various equipment. The concentration of the radiation background was measured in micro roentgen per hour. The quantity of macroparticles in the air, specifically PM2.5 (solid particles with an aerodynamic diameter of less than 2.5 µm) and PM10 (solid particles with a diameter of less than 10 µm), were determined (µg/m3). All these measurements were conducted in accordance with the monitoring program, and the equipment used met the manufacturer's calibration certificate requirements.

The summarized monitoring results are presented in Table 6.4. Compared with the IFC recommended standards, the results indicate that the level of air pollution in the Project AoI is below the required limits and does not exceed sanitary norms.

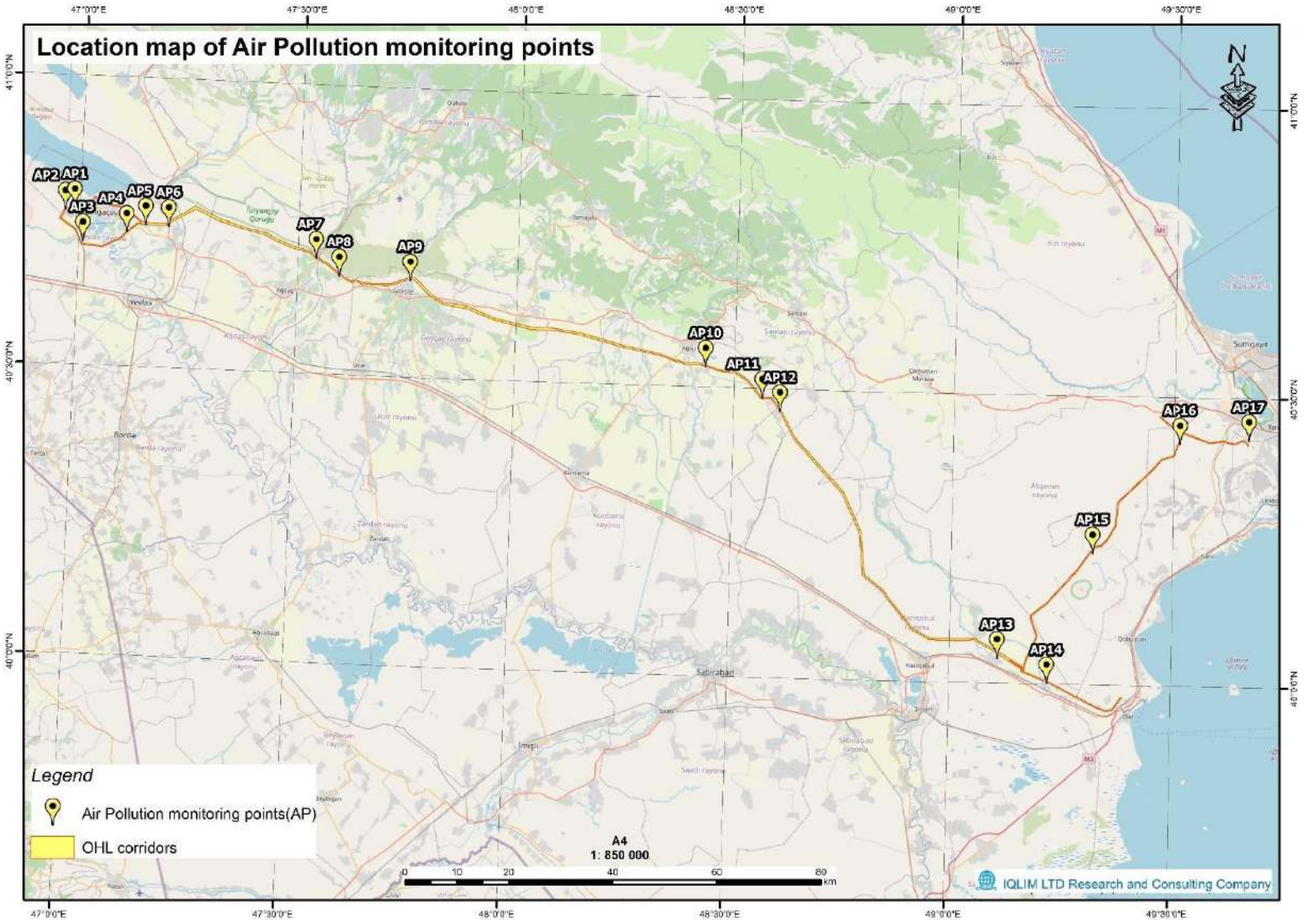


Figure 6.20: Location map of air quality monitoring stations

Table 6.5. Summary of ambient air quality monitoring results

Location	Monitoring period	PM2,5 µg/m3	PM10, µg/m3	Radiation µr/h	O2, mg/m3	CO, mg/m3	CO2, mg/m3	H2S, mg/m3	SO2, mg/m3	NO2, mg/m3	VOC, mg/m3
AP1 -	24-25.07.2024 -24 h	19	39	9	20,9	1,63	591	0,24	0,17	0,02	0,08
AP2 -	24-25.07.2024 -24 h	9	17	9	20,9	1,14	486	0,21	0,29	0,02	0,07
AP3 -	24-25.07.2024 -24 h	18	35	8	20,9	1,1	524	0,27	0,15	0,03	0,06
AP4 -	24-25.07.2024 -24 h	11	24	10	20,9	1,35	338	0,16	0,10	0,02	0,06
AP5 -	24-25.07.2024 -24 h	22	45	9	20,9	1,42	372	0,06	0,33	0,02	0,06
AP6 -	24-25.07.2024 -24 h	19	40	10	20,9	0,93	474	0,10	0,37	0,02	0,11
AP7 -	23-24.07.2024 -24 h	22	49	9	20,9	1,31	550	0,11	0,24	0,02	0,08
AP8 -	23-24.07.2024 -24 h	13	29	8	20,9	0,89	418	0,16	0,09	0,02	0,05
AP9 -	23-24.07.2024 -24 h	15	32	9	20,9	1,13	517	0,06	0,10	0,02	0,09
AP10 -	22-23.07.2024 -24 h	11	24	8	20,9	1,22	576	0,02	0,08	0,03	0,07
AP11 -	22-23.07.2024 -24 h	13	28	10	20,9	1,05	551	0,07	0,02	0,01	0,07
AP12 -	22-23.07.2024 -24 h	11	24	9	20,9	0,12	565	0,08	0,20	0,02	0,17
AP13 -	21-22.07.2024 -24 h	14	29	10	20,9	0,32	424	0,08	0,03	0,02	0,09
AP14 -	21-22.07.2024 -24 h	14	30	9	20,9	0,74	474	0,10	0,08	0,02	0,12
AP15 -	21-22.07.2024 -24 h	12	25	8	20,9	1,03	462	0,10	0,09	0,02	0,12

AP16 -	21-22.07.2024 -24 h	16	35	9	20,9	1,04	482	0,04	0,04	0,02	0,13
AP17 -	21-22.07.2024 -24 h	12	26	10	20,9	1,09	586	0,02	0,03	0,01	0,11
Air quality standards (for 24 hours)[30]		25,0	45,0			4,0			40,0	25,0	

30 https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and health#:~:text=Guideline%20values,NO&text=The%20current%20WHO%20guideline%20value,effects%20of%20gaseous%20nitrogen%20dioxide

6.8.4. Noise and vibration

Ambient noise monitoring was conducted at 17 monitoring locations within the Project impact area (Fig. 6.20). The monitoring locations were selected to quantify the baseline ambient noise levels. Noise measurements were conducted synchronously with air quality measurements. The number of measurement stations, their locations, measurement duration, and schedule correspond to those of the air quality measurement stations. At these locations, measurements were taken at positions corresponding to noise pollution-sensitive receptors. During the monitoring period, factors influencing noise concentration were investigated on-site and recorded as sources.

The daytime period is defined as the interval from 07:00 to 22:00, while the nighttime period spans from 22:00 to 07:00. The obtained results were subsequently compared with the ambient noise standards set for the respective categories. These standards are in line with the national regulations on 'Vibration and Noise Pollution Standards for Adverse Impact on the Environment and Human Health' as well as the IFC's Noise Guidelines[31].

During monitoring, the following factors were identified that influenced the background noise level:

AP-1 Industrial (high-voltage power lines), automotive, wind, people
AP-2 Birds, wind, people, cars
AP-3 Cars, birds, people, wind, farm animals
AP-4 Birds, insects, people, wind
AP-5 Farm animals, people, birds, wind
AP-6 Cars, birds, insects
AP-7 Cars, birds, insects, farm animals, wind
AP-8 Birds, farm animals, people, wind
AP-9 Wind, river flow, birds, cars, people
AP-10 Birds, people, wind
AP-11 Cars, wind, farm animals, people, birds
AP-12 Wind, farm animals, people, cars, birds
AP-13 Wind, birds, insects, people
AP-14 Wind, people, birds
AP-15 Wind, cars, birds
AP-16 Wind, birds
AP-17 Wind, birds

As part of the field studies, one-time measurement of the vibration levels was implemented at all 17 air quality monitoring stations. The measurements were taken during both day and night times. Each session

31 The IFC noise level guidelines are the hourly noise levels within the day and night time periods

lasted for 15 minutes and was repeated at three-hour intervals. The results of the 24-hour testing show that the vibration levels were less than 0.1m/sec² (mm/sec).

Summary of the noise and vibration measurements is provided in Table 6.6 below. The monitoring results are presented in Annex 3.

Table 6.6. Summary of noise and vibration measurement results

Monitoring Location	Monitoring Period	LeqA	L90A	L50A	L10A	Vibration m/sec2
AP1 -	24-25.07.2024 -24 h	49.8	50.5	50.2	55.3	<0,1
AP2 -	24-25.07.2024 -24 h	46.1	45.2	46.7	49.4	<0,1
AP3 -	24-25.07.2024 -24 h	60.9	68.1	74.9	66.7	<0,1
AP4 -	24-25.07.2024 -24 h	44.7	46.6	44.1	46.2	<0,1
AP5 -	24-25.07.2024 -24 h	48.7	48.5	48.5	44.3	<0,1
AP6 -	24-25.07.2024 -24 h	64.1	63.5	63.8	65.7	<0,1
AP7 -	23-24.07.2024 -24 h	69.8	72.9	68.1	68.1	<0,1
AP8 -	23-24.07.2024 -24 h	40.8	41.5	42.7	39.4	<0,1
AP9 -	23-24.07.2024 -24 h	49.5	48.9	50.4	52.4	<0,1
AP10 -	22-23.07.2024 -24 h	43.2	43.9	40.5	42.2	<0.1
AP11 -	22-23.07.2024 -24 h	67.3	73.6	69.8	66.8	<0.1
AP12 -	22-23.07.2024 -24 h	48.6	48.4	51.7	50.3	<0.1
AP13 -	21-22.07.2024 -24 h	44.7	45.6	44.1	49.1	<0.1
AP14 -	21-22.07.2024 -24 h	49.7	49.8	45.8	47.4	<0.1
AP15 -	21-22.07.2024 -24 h	40.8	32.5	40.6	42.8	<0.1
AP16 -	21-22.07.2024 -24 h	37.4	37.2	36.6	38.3	<0.1
AP17 -	21-22.07.2024 -24 h	44.8	50.3	46.6	46.6	<0.1

6.9. Waste Management

6.9.1. National Baseline

Rapid economic growth observed in the recent years have led to an increase in the volumes of goods and services consumed and, resultantly, the amount of waste generated by the people of Azerbaijan.

Domestic waste collection, transportation and disposal system is organized well in Greater Baku and several other large cities of the country. Nevertheless, efficiency of the system is either partial or none in the rural areas. Waste reuse and recycling measures have been developed limitedly.

In 2022, 3984 thsd. tons of waste was generated in the country, which is 5.4% more than the previous year. The produced waste composition consisted of 66.7% of the total waste, and 33.3% of the industrial waste.

78.3% of the total of 2658.3 thsd tons of solid household waste generated last year were landfilled, 21.2 % were used for energy production, and 0.5 % were sold within the country. The annual volumes of electricity produced from the household waste equalled 205.3 mln kWh, or 6.3 % more than in 2021. 28.5% of the industrial waste was used as raw material in the enterprises, 42.7% was sold domestically, 3.8% was exported, 13.8% was landfilled, and 11.2 % remained in the facilities. As a result of the production activity of enterprises, 337.1 thsd tons of hazardous waste were generated in 2022, and their share in the total amount of waste was 8.5%. 63.1% of the waste was generated in the mining industry, most of which fall to the enterprises located in Baku. Last year, 55,000 tons of hazardous waste was completely neutralized, including residues from previous years.

6.9.2. Study Area Baseline

The waste management system in the towns, settlements and villages of the Project AoI differ depending on type and status of the settlement. Thus, larger cities like Mingachevir and Yevlakh have got functioning waste collection system and centralized landfills, whereas some waste collection and disposal system in the smaller settlements and villages is arranged in a semi-organized way.

Mingachevir and district centres

In Mingachevir and other towns – centers of the respective administrative districts, waste management falls under the purview of the executive authorities, through the subordinate Departments of Landscaping and Sanitary Cleaning (DLSC) and the Housing and Communal Production Associations (HCPA - state-owned enterprises, funded by the local budget ad managed by the respective executive authority. No private organizations are contracted for waste collection and disposal services. These two state-owned enterprises are responsible for urban waste collection, street cleaning, landfill management, and fee collection.

The HCPAs exclusively provide waste collection services to individual houses, apartment buildings, commercial establishments, and government organizations (for example “Azerbaijan” TPP and “Mingachevir” HPP). The remainder of the towns are serviced by DLSC.

In the towns, all collected waste is transported directly to the landfills. There are two landfills in Mingachevir and one landfill in each of the other district centers of the Project AoI. In all towns, there are contracts concluded for waste collection with waste generating legal entities, whereas households pay fees as part of their communal payments.

Mixed municipal solid waste and similar waste are collected daily (seven days a week) from both residential and non-residential sources. As there is no separate collection system for hazardous waste, it is collected alongside regular household waste. All collected waste is then transported directly to the landfills.

The following collection schedules are used for the collection of mixed municipal and commercial waste:

- Call-on-demand system: Waste is collected upon request from residents or businesses.
- Collection from containers and bins: Waste is collected from designated containers and bins placed at strategic locations.
- Chute collection in high-rise buildings: Waste is collected from designated chutes in high-rise residential buildings.

Currently, there is no formal system in place for the separation or collection of recyclable materials. Recycling activities are carried out by the informal sector. Waste pickers sort through waste in city containers and at disposal sites (paper, cardboard, glass, and metal), while scavengers do so at landfills. There is no data available on the quantity of recyclable materials recovered from the waste stream.

Settlements and villages

Reportedly, most rural settlements in the districts within the Project AoI have designated waste disposal sites. Usually, domestic waste generated by the rural households is disposed of in 2-meter wide, 20-meter-long cells and periodically buried or incinerated by local municipalities. However, illegal dumpsites also exist in almost all villages in the district. These dumpsites are typically located in areas away from main roads in residential areas.

On-site sorting is carried out individually by residents. Sorted recyclable fractions are collected and handed over to relevant entities. There are no designated areas for hazardous wastes, and the landfill sites are not marked or protected.

Waste management in the rural settlements is formally coordinated by local EA representatives and municipalities. However, no waste collection fees are collected from the residents and there is no regular waste collection schedule.

6.10. Biodiversity

6.10.1. Introduction

Biodiversity baseline studies constitute comprehensive research undertaken to gather and analyse data pertaining to the biodiversity values, their present condition, and trends within a specific area before the initiation of a project. These baseline studies are instrumental in facilitating the assessment of project impacts and risks through the implementation of the biodiversity mitigation hierarchy and, if required, the establishment of a long-term biodiversity monitoring program.

This section delineates the findings of the research, providing a detailed description and evaluation of the current state of biodiversity within the impact zone of the Project facilities that will be implicated in its ongoing operation. Furthermore, this section underscores the imperative for conservation efforts at local, national, and international levels within the project vicinities.

Potential Critical Habitats

As part of the baseline and in accordance with ESS6, an exercise was undertaken to identify the presence of Critical Habitat. Critical Habitats are areas that support:

- Endangered or critically endangered species (based on the IUCN Red List or national criteria).
- Significant populations of migratory or congregatory species.
- Ecosystems or species essential to global or regional biodiversity.
- Key Biodiversity Areas (KBAs) or legally protected areas.

The assessment work included the potential impacts on biodiversity through direct, indirect and cumulative impacts. In accordance with ESS6, the Mitigation Hierarchy was followed:

- Avoid: Prioritize avoiding impacts on biodiversity, especially in critical habitats.
- Minimize: If avoidance is not possible, take steps to minimize the impacts through design modifications or operational changes.
- Rehabilitate/Restore: Where impacts occur, take steps to rehabilitate and restore affected habitats.
- Offset: If residual impacts remain, develop biodiversity offsets to compensate for any unavoidable biodiversity loss.

Consideration was also given to evaluation of ecosystem services and the benefits that people derive from the local ecosystem.

6.10.2. Biodiversity of Shirvan lowland and foothills of Ajinohur-Langabiz zone

A. Flora

Being an important integral part of the Kur-Araz depression, Shirvan plain belongs to the Kur-Araz botanical-geographical region and differs from other regions with its unique flora diversity. The dominant flora of the area consists of semi-desert and dry steppe communities that thrive in arid climatic conditions. The differentiation of vegetation cover on the plain occurs mainly in two directions - from East to West and from South to North. Riparian forests, black saxaul, black saxaul-wormwood, and wormwood plant groups replace each other. The microrelief forms observed against the general background of the Shirvan plain - buried uplifts, closed and flat depressions, coastal ramparts, ancient riverbeds, the Karasu depression, the Konarasi depressions, riverbeds, ravines, and gullies, ridges, and mounds created as a result of human economic activity - affect the development of this or that vegetation, creating its species diversity and differentiation within the territory. In the depressions, due to the relative humidity and connection with groundwater, meadow-grass vegetation has developed in the form of meadows. Wormwood, cereals, and mugwort are widespread on the foothill sloping proluvial-deluvial plain.

In the Mughan, Garasu, and Hajigabul stations in the north, in the foothill proluvial-deluvial sloping plain of the Langabiz ridge, on the alluvial fans of dry valleys and ravines, on the arch parts of the Padar, Shahsunnu, and Arshaly buried uplifts, and along the roadsides, the wormwood plant formation has formed.

From the northern part of the Shirvan plain, adjacent to the foothills, as well as from the alluvial fans of dry valleys and ravines, plant groups of wormwood, shiyav, mugwort, cereals, and various herbs, pomegranate, hawthorn, blackberry, willow, etc. have developed. In the inter-cone depressions of the Turyanchay, Goychay, Girdimanchay, and Aghsuchay rivers, under the influence of groundwater close to the surface, marsh and saline plants, in the watercourses - marsh plants, on the ridges - blackberry, elderberry bushes, wormwood, and various herbs, in ravines and gullies - tamarisk, blackberry, and moisture-loving herbs are common. Horizontal zonality is observed in the vegetation cover. On the alluvial deposits forming a narrow strip along the Kur River - annual herbaceous plants from the sedge family; Riparian forests on the banks of the Kur River; black saxaul semi-desert in the center of the plain; wormwood semi-desert a little further north; xerophytic shrub dry steppe vegetation in the foothills. In the flat eastern part of the plain, depending on the degree of soil salinity, black saline, succulent saline, winter saline annual saline plants, and yellowhead on microhills are common. The vegetation cover is seasonally dynamic. At the beginning of spring, with the increase in precipitation, ephemerals develop and form a green cover. In the second half of May, they complete their growing season. Drought-resistant plants remain on the plain. In autumn, with the increase in precipitation, the ephemerals begin to revive again. The most common plants in the Shirvan plain semi-deserts are camel thorn, Japanese knotweed, hard wheatgrass, small clover, etc. In the areas of Aghdash and Goychay regions, on the cones of the

Aghsuchay and Girdimanchay rivers, as well as on the plains along the Kur River, liquorice is very common. Meadow-grass vegetation has settled on the moistened soils in the depressions and depressions in place of the destroyed Riparian forests along the Kur River. Reed, a characteristic representative of meadow-grass vegetation, has developed on the banks of canals on the alluvial fans of the Aghsuchay, Goychay, and Turyanchay rivers, in the Karasu riverbed, and in watercourses.

In the depressions where groundwater is close to the surface, in lakes and streams, on the shores of Lake Hajigabul, in the swamps in the territories of Kurdamir, Zardab, and Ujar regions, aquatic marsh plants such as reed, water buttercup, sedge, etc. are common. Recently, with the drainage of swamps, the range of aquatic marsh plants has significantly decreased. While the described territory is located in a fragmented strip along the Kur River and in very small areas along the Goychay and Turyanchay rivers, it is currently preserved in the form of meadows due to the impact of human activity.

The Riparian forests along the Kur River near Karkhun, Agzibir, Piraza, Korpukand, and Alvand in the Shirvan plain have been relatively well preserved. The characteristic trees of these forests are white poplar, black poplar, long-leaved oak, southern willow, mulberry tree, willow, pear, and shrubs: tamarisk, pomegranate, barberry, buckthorn, hawthorn, and others. As you move away from the riverbed, microzonality is observed in the forests. On the river bank, there is first a narrow strip of willow and tamarisk trees, then a wide strip dominated by white poplar trees, followed by a strip of elm, oak, and hornbeam trees. Herbaceous plants are replaced by mesophilic plants as they move away from the filtration effect of water in the river for hygrophytes.

B. Fauna

Due to the rise of the relief from south to north in the Shirvan Plain, there is a noticeable change in the distribution of fauna. This change is more evident across the following landscape complexes:

Semi-desert and Dry Steppe: Gazelles were once characteristic of this area, living in herds, but their numbers have significantly decreased. Foxes, badgers, house and field mice, Williams' jerboa, and hares inhabit the area. In the northwest of the Shirvan Plain, large birds that feed on small insects, hedgehogs, wagtails, white-breasted wheatears, and the world's smallest mammal, the Etruscan shrew, can be found.

Depressions and Riparian Forests: Wild boar inhabit the reed beds in the depressions and the Riparian forests. The semi-desert and dry steppe zone is home to 22 species of nesting birds, including the little owl, eagle owl, scops owl, and short-eared owl. The black-bellied sandgrouse, red-crested pochard, and white-headed duck use old fox burrows for nesting. Pigeons and Eurasian collared doves live in nests on the slopes of ravines and river valleys. The black kite, kite, pallid harrier, blackbird, white-headed Asian magpie, and Egyptian vulture nest in the low mountainous and Riparian areas. Other birds like the hoopoe, great bustard, greylag goose, and red-breasted goose migrate to this area from other regions. As winter approaches, the number of yellow wagtails and kestrels increases.

Lakes: Water birds winter in the lakes. Various species of reptiles are characteristic of the semi-desert and dry steppe. Caspian turtles inhabit the river deltas, lakeshores, and swamps. Snakes like the red-bellied racer, blunt-nosed viper, Dahl's whip snake, and spotted whip snake can be found in the Shirvan Plain. Tarantula burrows are present almost everywhere. Among invertebrates, venomous black scorpions, ticks, and yellow spiders live in rodent burrows, while mosquitoes inhabit mosquito nests. In summer, the Shirvan Plain is teeming with insects, mosquitoes, and grasshoppers.

Riparian Forests: The Riparian forests in the area attract a large part of the fauna from the semi-desert zone. Mammals like wild boar, jackals, jungle cats, hares, and Transcaucasian hedgehogs are abundant here. Three species of bats can be found. Black kites, herons, grey herons, and white storks nest in the tops of tall trees. In addition, long-eared and short-eared owls, Eurasian jays, crows, cuckoos, and golden orioles are characteristic birds of the Riparian forests. Blackbirds and Spanish sparrows form colonies. Game birds like pheasants and francolins are present. Among reptiles, the green lizard and large legless lizard can be found, and the Danube crested newt inhabits the backwaters of the Kur River. Insects, beetles, and dragonflies are abundant.

Reed and Clay Lakes and Swamps: Wild boar, jungle cats, jackals, grey voles, and birds like the mute swan, little egret, glossy ibis, ducks, reed warblers, purple herons, and kingfishers inhabit the reed and clay lakes and swamps. A large number of coots, ducks, teals, pochards, and geese gather here for wintering. Bream, carp, shemaya, barbel, and catfish spawn in the backwaters. Crayfish live in the lakes and rivers. The drainage of swamps has negatively impacted the fauna.

6.10.3. Biodiversity of Eastern Gobustan

A. Flora

According to the botanical-geographical zoning of Azerbaijan, the part of the Project AoI stretching between Navahi and Gobustan settlements is included in Gobustan botanical-geographical region. The region's vegetation has relatively poor development, species composition, and phytomass.

- **Semi-desert flora** - ephemeral plant species that grow in floodplains, sands, and shallow lagoons.
- **Desert flora** - shrubs and halophytes, one of the most common exampleы of which are salt grass.

Vegetation in and around the project area (as well as in the affected zone of the project) can be divided into the following three floristic groups:

1. Semi-desert flora. The semi-desert vegetation covers most of the project land and its surrounding area. The semi-desert flora species observed in the area are characterized by arid climate and clay / saline soils with very low levels of organic matter.

The semi-desert vegetation is characterized by the Salsoletum vegetation collection. Long-lived sagebrushes and ephemeral species of Salsola dendroides, Salsola ericoides, Salsola nodulosa, Suaeda

microphylla, fragrant sagebrushes (Artemisia lerchiana) and poorly developing cereal-like shrubs, Bromus laponicus, Medicago minima, Medicago coerulea Poa bulbosa, Bromus japonicus, Lolium rigidum, Eremopyrum orientale, Erodium cicutarium are the main components of the semi-desert flora.

Blue algae (Suaeda glauca) and salt-tolerant species of shrubs, as well as Kalidium caspicum, Halocnemum strobilaceum and others are found in areas with increased salinity.

There is no natural vegetation and the soils are exposed to denudation in large areas. This situation is partly due to overgrazing and landslides, which increase soil erosion from rain and wind.

2. Coastal vegetation. Coastal vegetation is common in the course of the Jeyrankechmez River, which passes through the Project area and flows into the Caspian Sea. The number of flora representatives in the depressions formed by the ephemeral current increases and includes mainly non-agricultural Tamarix meyeri, Alhagi pseudoalhagi, Juncus acutus, and Salicornia europaea. You can also find small reeds in places where the current creates temporary stagnant ponds. In these areas, the effects of soil trampling by livestock can also be observed.

Valleys, hills, and plains of the project area were studied during the studies carried out as part of the EBS. The foothills, which make up most of the range, are rich in ephemeral species that bloom in spring (Veronica arvensis), gooseberries (Tragopogon graminifolius), Torularia contortuplicata, Nonea lutea, as well as herbaceous plants Cynodon dactylon, Anisantha rubens, Aegilops biunciali.

In the flat, saline, and arid areas of the southeastern foothills of the project area, sagebrush was recorded as well as patches of willow (Tamarix sp.), grasses and flowering ephemeral species. Astragalus bakuensis and Ferula persica are listed in the Red Book of Azerbaijan. Other parts of the plain are characterized by dry, fine-grained clay soils and minimal vegetation. Salsola nodulosa and Suadea microphylla were found in the area, as well as Poa bulbosa, Medicago minima, and small tree species. Wetlands dominated by semi-desert communities (Salsola dendroides, S. nodulosa spp. and Artemisia fragrans) and reed (Phragmites australis and Typha latifola) communities, as well as willow bushes (Tamarix spp.) were found in some areas near the Sangachal terminal. Individual representatives of the Caucasian endemic Iris autiloba have been noted in these areas.

Solonchak and meadow plant species are widely developed in the gorge of the Jeyrankechmez River. The area of distribution of Yulgun (Tamarix spp.) shrubs and species of Iris autiloba is noted here.

B. Fauna

The semi-desert landscapes of the Project area, partially degraded by human activities with poor vegetation cover, are characterized by a variety of fauna with a predominance of reptiles. During the study of fauna carried out as part of the EBS, the following results were obtained:

1. Mammals. The Eastern Gobustan is home to 38 mammal species. Previous field studies in the Project AoI have revealed the presence of predominantly small mammals, with occasional sightings of medium and large mammals that may traverse the area. Examples of such transient species include jackals (Canis aureus) and wolves (Canis lipus), which follow ungulates during the winter, and the resident red fox (Vulpes vulpes, LC). Other typical mammals in the area include house mice, bats, weasels, European rabbits, hedgehogs, and badgers.

Two protected mammal species have been identified in the project area as part of the previous studies:

- Goitered Gazelle (Gazella subgutturosa): Listed as Vulnerable (VU) on the IUCN Red List and included in the Azerbaijan Red Book.
- Schreiber's Bat (Miniopterus schreibersii): Listed in the Azerbaijan Red Book.

No endemic mammal species have been recorded.

2. Reptiles. The Eastern Gobustan region is home to 18 reptile species, primarily snakes and lizards. The Mediterranean tortoise (Testudo graeca) is the sole reptile species in the project area recognized as vulnerable by both the IUCN Red List and the Red Book of Azerbaijan.

3. Amphibians. The presence of amphibians in a given area is directly linked to the availability of wetlands and vegetation, crucial for their habitat and reproduction. A review of relevant literature indicates that four amphibian species potentially inhabit the project area: the green Eurasian frog, common tree frog, Asia Minor frog, and lake frog. However, field studies conducted in the region did not yield any direct observations of these species.

4. Birds. Azerbaijan boasts a rich avian diversity, with over 360 recorded bird species. The nation's coastal zones and wetlands become particularly crucial during migration and wintering periods, providing vital habitats for numerous migratory birds alongside the resident species. The project area, situated along the primary migratory route across the Caspian plains, witnesses significant avian activity.

In Gobustan, autumn migration commences in late August, peaking in November, and concludes by mid-December. Conversely, the spring migration spans from late February to April, with a peak in March, as birds journey in northern, north-western, and north-eastern directions. The breeding season for most birds extends from March to August, while spring and autumn migrations occur between March and April and August and October, respectively. Wintering birds inhabit the coastal areas from October to March.

Birds constitute the most diverse vertebrate fauna in the project area. Common resident species during the summer nesting season include the crested lark (Galerida cristata, LC), isabelline wheatear (Oenanthe isabellina, LC), common starling (Sturnus vulgaris, LC), and rook (Corvus frugilegus, LC). The house sparrow (Passer domesticus, LC) and Eurasian blackbird (Turdus merula, LC) are also permanent residents.

Additionally, the avian fauna encompasses the common kestrel (Falco tinnunculus, LC), rock dove (Columba livia, LC), European turtle dove (Streptopelia turtur, VU), little owl (Athene noctua, LC), and others. Notably, species like the isabelline wheatear, lesser kestrel (Falco naumanni, LC), blue-cheeked bee-eater (Merops superciliosus, LC), Eurasian penduline tit (Remiz pendulinus, LC), red-backed shrike (Lanius collurio, LC), and lesser grey shrike (Lanius minor, LC) are common summer breeders in the area32.

Alarmingly, fifteen potentially common bird species within the project area are classified as threatened according to global standards, with two listed as endemic, three as endangered, and ten as vulnerable. Furthermore, several species are included in the Red Book of Azerbaijan, highlighting the urgent need for conservation efforts in the region.

6.10.4. Protected nature areas / Key Biodiversity Areas

A. Turyanchay State Nature Reserve

Established in 1958 and expanded in 2003, the Turyanchay State Nature Reserve Is located on the spurs of the Bozdag Mountain Ridge, encompassing 22,488 hectares within the territories of Aghdash, Oguz, Yevlakh, and Gabala districts.

The primary objective of the reserve is to protect and restore the region's arid light forests and other natural resources. This semi-desert landscape is characterized by pistachio, juniper, and oak trees, essential for soil and water conservation. Furthermore, the reserve supports a diverse array of wildlife, including numerous bird species like the golden eagle and the bearded vulture.

Although comprehensive literary documentation on the reserve's faunal diversity is not readily available, the Red Book of Azerbaijan indicates the presence of over 17 rare animal species within the reserve. These species include the common tortoise, osprey, steppe eagle, Asian imperial eagle, Egyptian vulture, black vulture, griffon vulture, saker falcon, lanner falcon, hobby falcon, great bustard, little bustard, lapwing, European turtle-dove, lesser horseshoe bat, Ognev's serotine, and marbled polecat.

B. Shirvan National Park

The Shirvan National Park is not within the AZURE Project AoI, however, holds particular significance as a crucial point along avian migration routes. Its lakes and coastal areas provide essential feeding, breeding, and staging grounds for various waterbird species during migration and wintering periods. Established in 2003, Shirvan National Park encompasses 54,373.5 hectares within the Salyan district. Situated on the Shirvan lowland, a former seabed of the Caspian Sea, the park's semi-desert landscape features diverse habitats, including coastal dunes, salt marshes, and steppes.

32 www.adb.org

The park supports a rich variety of wildlife, notably the endemic goitered gazelle. Additionally, it serves as a habitat for a large number of bird species, such as flamingos, pelicans, and herons. The park's recorded fauna includes 17 reptile species, 230 bird species, and 29 mammal species. Several of these species, including the common tortoise, osprey, steppe eagle, white-tailed sea eagle, greater spotted eagle, Asian imperial eagle, saker falcon, and goitered gazelle, are listed in the Third Edition of the Red Book of Azerbaijan (2023).

As a vital site for conservation and ecotourism, Shirvan National Park offers visitors a range of activities, including birdwatching, hiking, and camping. The park's unique geological formations, including mud volcanoes, serve as additional attractions for tourists.

C. "Mud volcano group" State Nature Reserve

The reserve was established by the Order of the President of the Republic of Azerbaijan No. 2315 dated August 15, 2007, in the territory of some mud volcanoes located in Baku and Absheron peninsula. According to the relevant order, the main purpose of the Reserve's establishment is to reduce the anthropogenic impact on mud volcanoes, as well as stop the intensive construction work here and prevent the new build property development in areas where volcanoes are likely to erupt. According to Order No. 294 of the Cabinet of Ministers of the Republic of Azerbaijan dated September 29, 2011, the area of 43 mud volcanoes on the territory of 12,322.84 hectares has been declared a reserve. The reserve's activity has two priority areas: protection of natural areas to preserve the natural state of volcanic landscapes, natural complexes, and objects; organization of scientific research and environmental monitoring.

The staff of the reserve maintains the natural state of the volcanic landscape. For this purpose, regular scientific stationary observations are carried out for 43 mud volcanoes with a special protection status, the state of the natural environment is predicted, the scientific foundations for nature protection are being prepared, the dynamics of volcanic processes and their protection from anthropogenic interference are being studied. 6 mud volcanoes that are part of the reserve (Otman-Bozdagh, Suleyman-akhtarma, Chapilmysh, Jeyil-akhtarma, Shahgaya) are located in the Project area.

D. Bird migration routes

Scientific analysis of migratory patterns across numerous species has led to the identification of eight major flyways: East Atlantic, Mediterranean-Black Sea, West Asian-African, Central Asian, East Asian-Australasian, and the Pacific, Mississippi, and American Atlantic flyways in the Americas. Azerbaijan lies within the migratory paths of two Eurasian flyways: 1) The Mediterranean-Black Sea Flyway: This route links breeding grounds in northern and central Europe with wintering areas in Africa; 2) The West Asian-Africa Flyway: This flyway connects the Arctic regions, from Yamal to the New Siberian Islands, with eastern Africa and the Middle East.

Azerbaijan holds a significant place in the migration routes of various bird species. The country offers a diverse landscape, from the Caspian Sea coastline to the Caucasus Mountains, creating ideal habitats for both resident and migratory birds. The following key bird migration routes pass across the territory of the country:

The Caspian Flyway: This route, along the Caspian Sea coastline, is one of the most important bird migration corridors in the world. Millions of birds, including waterfowl, raptors, and songbirds, use this route during their spring and autumn migrations. The Beshbarmag Mountain area acts as a bottleneck, concentrating the bird flow and making it a prime birdwatching spot.

The Caucasus Mountains: These mountains provide a natural barrier and corridor for migrating birds, offering diverse habitats at different altitudes. Many raptors, such as eagles and vultures, use the mountain updrafts for soaring and navigating during their long journeys.

The Kur River Valley: This lowland area attracts a variety of waterbirds, including ducks, geese, and waders, during their migration. The wetlands and lakes in this region provide essential stopover sites for these birds to rest and refuel.

As seen from Figure 6.22 below, the linear nature of the Project AoI requires crossing a number of key bird migration routes. The fall migration period across all routes spans from mid-August to mid-December. On-site bird migration route surveys were conducted in autumn 2024. Supplementary surveys will be carried out in spring and summer 2025, prior to the AZURE Project's construction phase, as further detailed in the Biodiversity Management Plan (Annex 7).

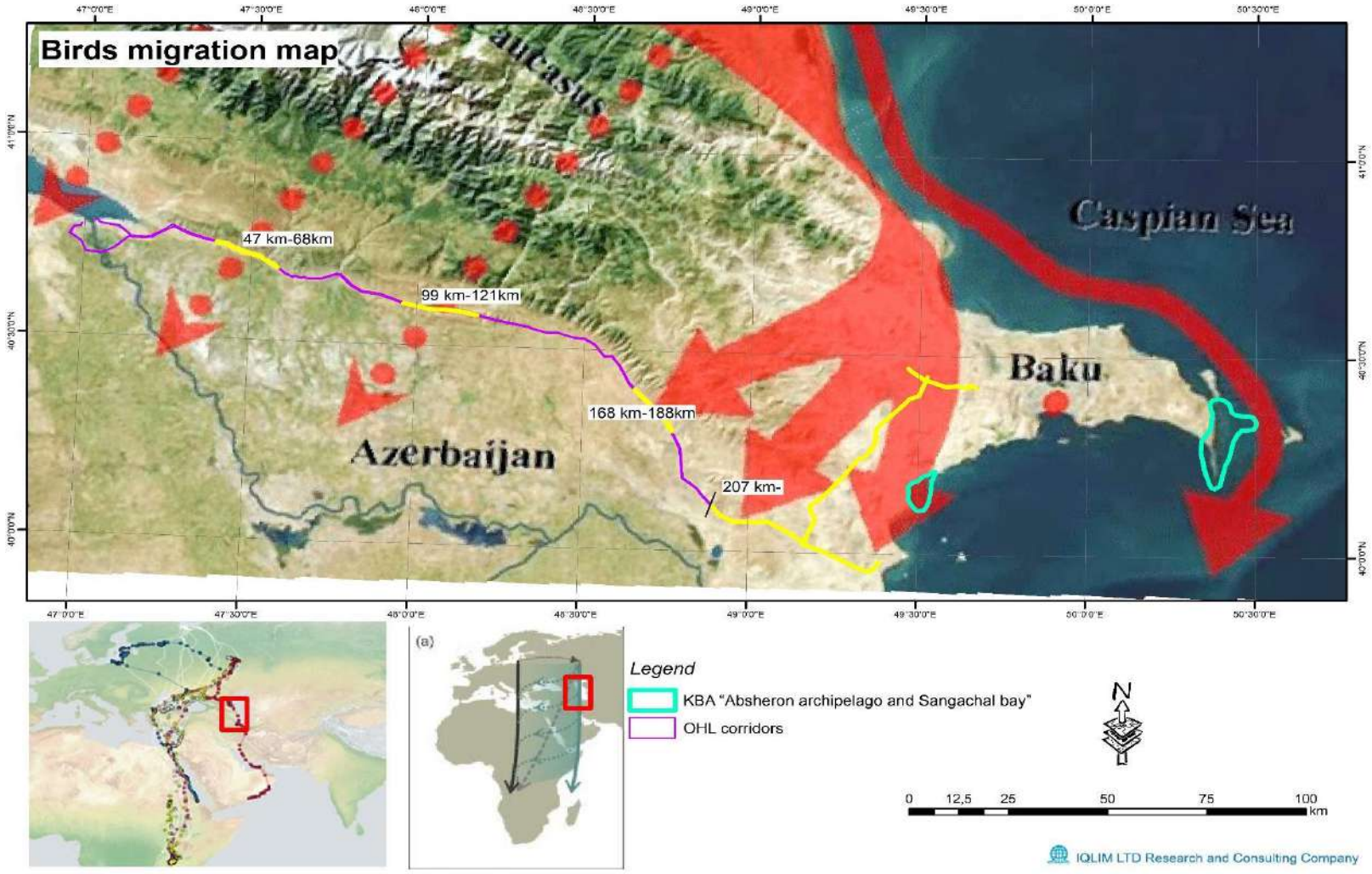


Figure 6.21. Interference of Project AoI with bird migration routes and Key Ornithological Areas of Azerbaijan

E. Key Ornithological Areas (aka Important Bird Areas, IBAs)

1. Gobustan KOA is located near the Project area and covers an area of 5,000 hectares. The mentioned KOA covers low arid mountains, including volcanoes such as Boyukdash, Kichikdagh, Kenizdagh, Cingirdagh, and the Jeyrankechmez River. There are common pear (Pyrus), ficus (Ficus), pomegranate (Punica), and others on the eastern slopes of the mountains. The central part of this KOA is fully and partially the northern part are in the area of the Gobustan Nature Reserve protected by the state. Gobustan KOA includes species of interest for the global conservation of birds and reptiles. The common tortoise (Testudo graeca) is one of them, one of the most endangered species recognized according to the IUCN Red List. In total, 9 species of birds inhabit the KOA during the breeding season.

2. "Alat Bay - Baku Archipelago" KOA is located in an area of 11,992 hectares. According to the IUCN, the resident bird inhabiting the area is the white-headed duck (Oxyura leucocephala, EN), The shortest distance between KOA and the Project AoI is 14 km from Alat bay and 58 km from Baku Archipelago;

3. "Sangachal Bay" KOA occupies an area of 4,000 hectares. This area, with its sandy beaches and dense reed swamps, is important for birds to migrate and overwinter. So, at least 20,000 water ducks and 30,000 coots (Fulica atra) pass through here every fall. The number of bird species registered in this area in different seasons is 177. The following species of birds make up the main biodiversity of this region: Cygnus Cygnus LC, Netta Rufina, LC, Aythya fuligula, LC, Fulica atra, LC, Pelecanus onocrotalus, LC, Phalacrocorax carb, LC, Podiceps cristatus, LC and waterfowls. Rare migratory birds include: Phalacrocorax pygmeus, Pelecanus crispus, NT, Branta ruficollis, VU, Circus macrourus VU, Aquila heliacal, VU, Falco naumanni, LC and Tetrax tetrax, NT. Examples of birds that stop during the transition are Ansera, LC, Himantopus himantopus, LC, Chlidonias leucopterus, LC, Sterna caspia, LC, and many others. Typical desert ephemeral plants are found in the area, and there are reeds along the coastal zone. There are some mammals here: Lepus europaeus, LC, Canis lupus, LC, and Canis aureus, LC. The shortest distance between KOA and the Project AoI is 14 km.

4. “Gil Adasi” KOA occupies an area of 200 hectares. Gil Adasi is the largest volcanic island in the Baku archipelago, where the area is almost devoid of vegetation due to the large population of wild rabbits. The biological diversity of the KOA is based on the following species: Cygnus Cygnus, LC, Glareola pratincole, LC, Larus cachinnans, LC, Tadorna ferruginea, Sterna hirundo, LC and Sternula albifrons, LC. The shortest distance between KOA and the Project AoI is 6.4 km.

Location map of all cited KOAs is provided in Figure 6.22 below.

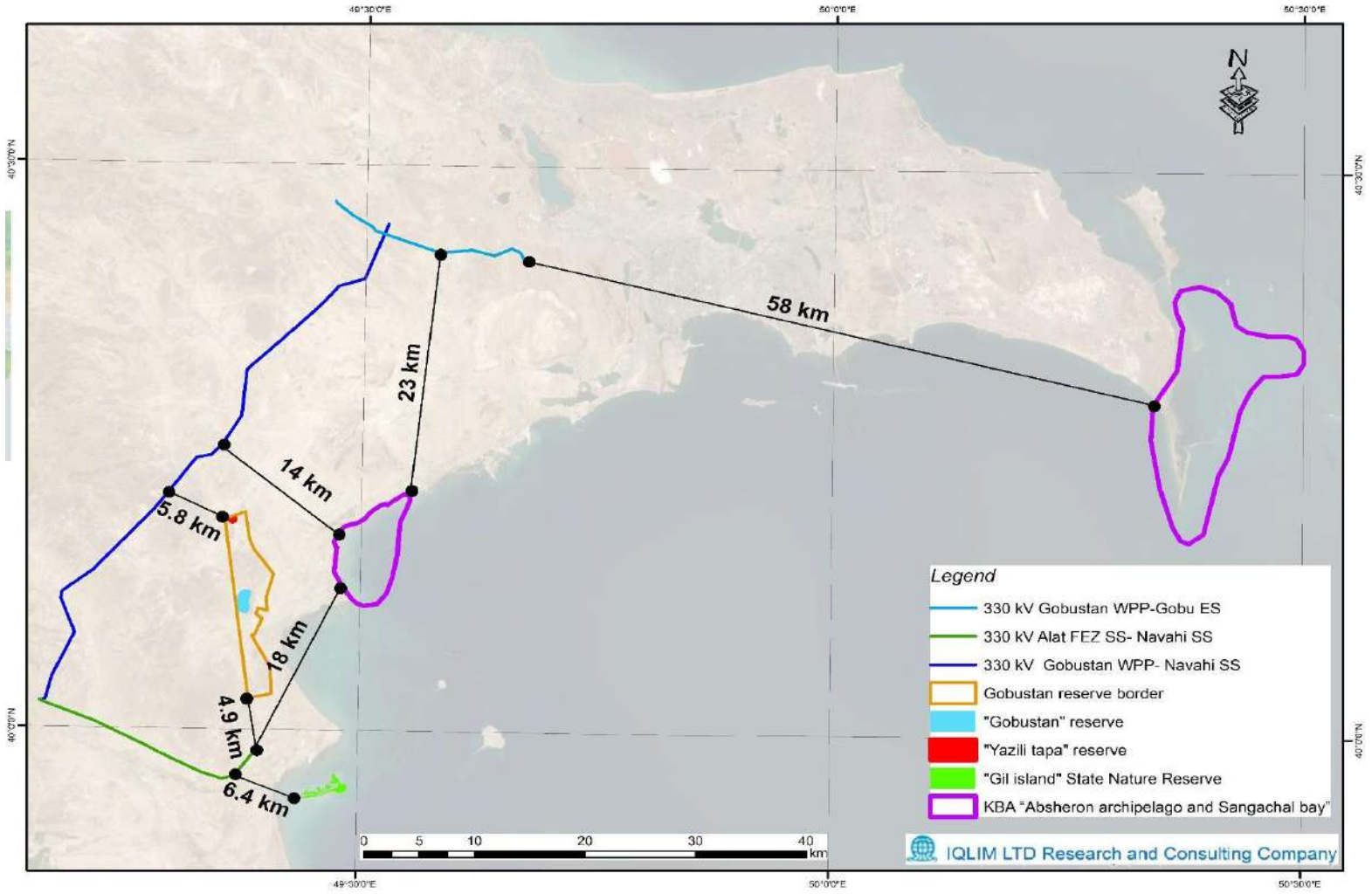


Figure 6.22: Map of Key Ornithological Areas

6.10.5. Species spread in the Project area

6.10.5.1 Flora

In the scientific literature data, about 1544 species (including subspecies) are distributed along the Project AoI, which crosses Gobustan, Absheron, Kur-Araz and Kur floristic regions. 1426 of the species are grasses, 94 are shrubs and 27 are trees. Due to the severe anthropogenic influence of the species distributed in the entire ecosystem, the development diversity of the species in the areas is less.

Within the Project AoI, 561 plant species are spread, including 512 herb, 22 shrub, 14 subshrub and 12 tree species were identified during the field studies implemented. Semi-desert vegetation dominates.

Table 6.7. Division of plants by life form

Life form	Species
Trees	12
Shrubs	22
Subshrubs	14
Herbs	512
-Annual	105
-Biennial	46
-Perennial	361

The assessment of rare species was implemented based on the 2023 edition of the Red Book of the Republic of Azerbaijan. 6 plant species from Red Book of Azerbaijan were found on the project area. Astragalus geminus, Iris acutiloba, Dianthus schemachensis were observed in Gobustan, Calligonum bakuense from Alat-Garadagh, Punica granatum and Juniperus foetidissima from Goychay (Near Turyanchay State Reserve). According to IUCN standards, Astragalus geminus Maassoumi is prioritet species with Endangered category. Sternbergia colchiciflora, Anacamptis coriophora and Iris schelkownicowii were registered Goychay and Yevlakh districts with same coordinate with lines (Red Book of Azerbaijan).

Table 6.8. Rare plant species of regional priority distributed in the project area as of 2023

Species	Abudance	Coordinate	IUCN	National Risk Categories
Astragalus eminus Maassoumi	One point	40.458379° 49.487275°	EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)	EN B1ab(i,ii,iii,iv)+2ab(i,ii,v)
Iris acutiloba C.A.Verz.	Occasionally	40.469920° 49.464311°		EN B2b(ii,iii,v)
Dianthus schemachensis Schischk	Occasionally	40.456019° 49.510438°	LC	EN B1ab(iii,iv,v)c(iii,iv)+2ab(ii)c(ii,iii)
Calligonum bakuense Lit.	One (A little out of line)	40.243740° 49.308499°		EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)
Punica granatum L.	One	40.667233° 47.593263°	LC	VU B1ab(i,ii,iii)
Juniperus foetidissima Willd	One	40.669993° 47.773821°	LC	NT
Sternbergia colchiciflora Waldst. & Kit	Not observed. But other scientists registered on the line (Rare Book)	Garamaryam, Bighir villages, Goychay		EN B2ab(ii,iii)
Anacamptis coriophora (L.) R.M.Bateman, Pridgeon & M.W.Chase	Not observed. But other scientists registered on the line (Rare Book)	Goychay	LC	VU B1b(i,iii,v)
Iris schelkownicowii (Fomin) Fomin	Not observed. But other scientists registered on the line (Rare Book)	Khanabad, Yevlakh		EN B2ab(v)

Note: EN – Endangered; VU – Vulnerable to extinction, LC – Least Concern, NT-Near Threatened

6 rare species were found in the floristic study area. 5 species include IUCN Red List (4 species – LC, 1 - EN). Species are important species for Azerbaijan especially species have EN category. For these species, safe translocation, reproduction and establishment of individual conservation zone is imperative. If the mentioned measures are implemented, the flora of the area is suitable for the implementation of the project.

6.10.5.2 Ichthyofauna, amphibians, reptiles, mammals

General characteristics

Literature surveys were conducted within the EBS framework, focusing on the following taxons: 1) amphibian species; 2) reptiles species; 3) bird species; 4) mammal species. As a result of the literature analysis, lists of terrestrial fauna species potentially present in the Project area were developed.

The number of species identified as present or potentially present within the Project area for each taxonomic group is as follows:

- 39 fish species;
- 3 amphibian species;
- 21 reptile species;
- 79 bird species;
- 29 mammal species.

The following 10 species are listed threatened at global level by IUCN:

1. Endangered (CR) species:
    - Aquila nipalensis (Steppe Eagle)
    - Neophron percnopterus (Egyptian Vulture)
    - Falco cherrug (Saker Falcon)
    - Vulnerable (VU) species:
    - Testudo graeca (Common Tortoise)
    - Aquila heliaca (Asian Imperial Eagle)
    - Falco vespertinus (Red-footed Falcon)
    - Otis tarda (Great Bustard)
    - Streptopelia turtur (European Turtle-Dove)
    - Vormela peregusna (Marbled Polecat)
    - Gazella subgutturosa (Goitered Gazelle)

- Ichthyofauna

36 species and subspecies of fishes are spread Mingachevir Reservoir, also in the middle and lower reaches of Kur River. 6 species of pisces (Salmo fario, Salmo caspius, Luciobarbus capito, Luciobarbus brachycephalus caspius, Ballerus sapa bergi, Pelecus cultratus) are included to the Red Book of Azerbaijan (2023). Of these species, only Bulatmai Barbel (Luciobarbus capito) is considered Vulnerable at global level by IUCN.

Table 6.9. Fishes of middle and lower reaches of Kur

N	Species name	Common name	Red Book of Azerbaijan, 2023	IUCN
1	Salmo fario	River Trout	EN	LC
2	Salmo caspius	Caspian Trout	CR	LC
3	Rutilus caspicus	Caspian Roach	-	LC
4	R. frisii kutum	Kutum	-	LC
5	Leuciscus cephalus orientalis	Chub	-	LC
6	Scardinius erythrophthalmus	Common Rudd	-	LC
7	Aspius aspius taeniatus	Aral Asp	-	LC
8	Leucaspius delineatus	Belica	-	LC
9	Tinca tinca	Tench	-	LC
10	Chondrostoma cyri	Kura Nase	-	LC
11	Romanogobio persa	Kura Gudgeon	-	LC
12	Capoeta capoeta	Caucasian Scraper	-	LC
13	Luciobarbus ciscaucasicus	Terek Barbel	-	LC
14	Luciobarbus capito	Bulatmai Barbel	VU	VU
15	Luciobarbus brachycephalus caspius	Caspian Barbell	VU	LC
16	Luciobarbus cyri	Kura Barbel	-	LC

N	Species name	Common name	Red Book of Azerbaijan, 2023	IUCN
17	Luciobarbus mursa	Mursa	-	LC
18	Alburnus chalcoides	Caspian Bleak	-	LC
19	Alburnus hohenackeri	Caucasian Bleak	-	LC
20	Alburnus filippi	Kura Bleak	-	LC
21	Alburnoides bipunctatus	Caucasian Bream	-	LC
22	Blicca bjoerkna transcaucasica	Silver Bream	-	LC
23	Abramis brama orientalis	Freshwater Bream	-	LC
24	Ballerus sapa bergi	White-eye Bream	CR	LC
25	Vimba vimba persa	Caspian Vimba	-	LC
26	Pelecus cultratus	Sichel	CR	LC
27	Rhodeus amarus	Amur Bitterling	-	LC
28	Cyprinus carpio	Common Carp	-	LC
29	Cobitis taenia satunini	Spined Loach	-	LC
30	Sabanejewia aurata	Golden Spined Loach	-	LC
31	Sabanejewia caspia	Caspian Spined loach	-	LC
32	Silurus glanis	Wels Catfish	-	LC
33	Gambusia affinis	Western Mosquitofish	-	LC
34	Perca fluviatilis	European Perch	-	LC
35	Knipowitschia caucasicus	Caucasian Dwarf Goby	-	LC
36	Ponticola platyrostris constructor	Caucasian Goby	-	LC
Total: 36 species			6	1

Note: CR – Critically Endangered; EN – Endangered; VU – Vulnerable to extinction; NT – Near-

Threatened; LC – Least-concern; DD – Data Deficient.

Amphibians and Reptiles

According to the scientific literature (Alakbarov, 1978), three amphibian species have been distributed in the project area. None of the amphibian species recorded in the study area have a global or national conservation status. The Eurasian Marsh Frog (Pelophylax ridibundus) is included in Appendix II of the Bern Convention, while the Variable Toad (Bufotes variabilis) is included in Appendix III.

21 species of reptiles (Testudo graeca, Paralaudakia caucasia, Psedopus apodus, Eumeces schneiderii, Eremias arguta, Lacerta strigata, Xerotyphlops vermicularis, Eryx jaculus, Natrix natrix) have been spread in the section of the Power Line that passes through the steppe of the lowlands.

Common tortoise (Testudo graeca) is globally classified as a Vulnerable (VU) species according to the IUCN Red List (http://www.iucnredlist.org.), indicating its sensitivity to population decline. Other species, however, have a lower conservation status and are classified as Least Concern (LC). Greek tortoise has been included in the third edition of Azerbaijan's Red Book with the Near Threatened (NT) status, indicating its proximity to the endangered threshold (Red Book of Azerbaijan, 2023).

Table 6.10. Amphibians and reptiles distributed along OHL corridors

N	Species name	Common name	Red Book of Azerbaijan, 2023	IUCN
Amphibians				
1	Bufotes variabilis	Variable Toad	-	LC
2	Hyla orientalis	Oriental Tree Frog	-	LC
3	Pelophylax ridibundus	Eurasian Marsh Frog	-	LC
Total: 3 species				
Reptiles				
1	Emys orbicularis	European Pond Turtle	-	NT
2	Mauremys caspica	East Caspian Turtle	-	LC
3	Testudo graeca	Common Tortoise	NT	VU
4	Tenuidactylus caspius	Caspian Bent-Toed Gecko	-	LC

N	Species name	Common name	Red Book of Azerbaijan, 2023	IUCN
5	Paralaudakia caucasia	Caucasian Agama	-	LC
6	Eumeces schneiderii	Schneider's Skink	-	LC
7	Eremias arguta	Steppe – runner	-	LC
8	Eremias velox	Rapid Fringe-toed Lizard	-	LC
9	Lacerta strigata	Caucasus Emerald Lizard	-	LC
10	Ophisops elegans	Snake – eyed Lizard	-	LC
11	Xerotyphlops vermicularis	Eurasian Blind Snake	-	LC
12	Eryx jaculus	Javelin Sand Boa	-	LC
13	Dolichophis schmidti	Schmidt's Whip Snake	-	LC
14	Eirenis collaris	Collared Dwarf Racer	-	LC
15	Elaphe urartica	Urartian Ratsnake	VU	LC
16	Hemorrhois ravergieri	Spotted Whip Snake	-	LC
17	Platyceps najadum	Dahl's Whip Snake	-	LC
18	Telescopus fallax	Mediterranean Cat Snake	-	LC
19	Natrix natrix	European Grass Snake	-	LC
20	Natrix tessellata	Dice snake	-	LC
21	Macrovipera lebetina	Levantine Viper	-	LC
Total: 21 species			2	2

Note: CR – Critically Endangered; EN – Endangered; VU – Vulnerable to extinction; NT – Near-Threatened; LC – Least-concern; DD – Data Deficient.

Mammals

On the basis of the literature review 29 mammal species were identified and are listed in Table 6.12. Among mammals, small mammals like rodents (9) and bats (9) predominate. However, medium and large size mammals such as European Hare, Wild Boar, Goitered Gazelle and Gray Wolf also recorded along Power Line territory. The majority of species are common and widespread, with only Goitered Gazelle (Gazella subgutturosa) listed as VU according to the IUCN Red List. Three species of mammals are listed in the Red Book of Azerbaijan (2023).

Table 6.12. Mammals distributed along the Power Line

N	Species name	Common name	Red Book of Azerbaijan, 2023	IUCN
1	Erinaceus concolour	Southern White-breasted Hedgehog	-	LC
2	Hemiechinus auritus	Long-eared Hedgehog	-	LC
3	Rhinolophus hipposideros	Lesser Horseshoe Bat	CR	LC
4	Rhinolophus ferrumequinum	Greater Horseshoe Bat	-	LC
5	Myotis blythii	Lesser Mouse-eared Bat	-	LC
6	Barbastella caspica	Western Barbastelle	VU	LC
7	Pipistrellus pipistrellus	Common Pipistrelle	-	LC
8	Pipistrellus kuhlii	Kuhl`s Pipistrelle	-	LC
9	Hypsugo savii	Savi`s Pipistrelle	-	LC
10	Eptesicus ognevi	Ognev´s serotine	VU	LC
11	Eptesicus serotinus	Serotine Bat	-	LC
12	Lepus europaeus	European Hare	-	LC
13	Hystrix indica	İndian Crested Porcupine	-	LC
14	Allactaga euphratica	Euphrates Jerboa	-	LC
15	Allactaga elater	Small Five-toed Jerboa	-	LC

N	Species name	Common name	Red Book of Azerbaijan, 2023	IUCN
16	Cricetulus migratorius	Adi boz sıçancıq	-	LC
17	Meriones libycus	Libyan Jird	-	LC
18	Microtus socialis	Social Vole	-	LC
19	Mus musculus	House Mouse	-	LC
20	Rattus norvegicus	Brown Rat	-	LC
21	Sylvaemus witherbyi	Steppe Field Mouse	-	LC
22	Canis lupus	Gray Wolf	-	LC
23	Canis aureus	Golden Jackal	-	LC
24	Vulpes vulpes	Red Fox	-	LC
25	Mustela nivalis	Least Weasel	-	LC
26	Vormela peregusna	Marbled Polecat	DD	VU
27	Meles meles	European Badger	-	LC
28	Sus scrofa	Wild Boar	-	LC
29	Gazella subgutturosa	Goitered Gazelle	VU	VU
Total number of species: 29				

6.10.5.3 Birds

A. Literature data

In accordance with WB ESF ESS6, a CHA is necessary due to biodiversity hotspots, including sections of the Central Asian migration corridors and protected sites within the Project AoI. The Study area is crossed by critical flyways for over 20 species, with more than 1% of their world population passing through. The flyways are used by several globally threatened or near-threatened (NT) species, including Dalmatian Pelican, Little Bustard, Sociable Lapwing, Steppe Eagle, and various wetland birds.

Additionally, different parts of the Project AoI are located close to the critical resident bird habitats described in Section 6.10.4 above.

Since there is no specific literature data on the ornithological diversity of the Study area, literature review of the ornithological diversity of the Study area was based on the results of the previous studies implemented by MENR and ornithologists within the course of the past 2 years in the different parts of the OHL corridors and on Varvara Reservoir situated in the west of the Study area. According to the study results there are at least 77 bird species across the Project AoI, including 28 species in the Varvara reservoir. The complete list of species found to date is in Tables 6.13 and 6.14 below.

Table 6.13. List of all bird species recorded during the past surveys

№	Latin name	Local name	English name	Status		Seasonal status
				IUCN	ARDB	
	Tachybaptus ruficollis	Kiçik batağan	Little grebe	-	-	R
	Podiceps cristatus	Böyük batağan	Grat crested grebe	-	-	R
	Phalacrocorax carbo	Böyük qarabatdaq	Great cormorant	-	-	R / M
	Microcarbo pygmaeus	Kiçik qarabatdaq	Pygmy cormorant	-	-	R
	Nycticorax nycticorax	Adi qarıldaq	Night heron	-	-	R / M
	Egretta garzetta	Kiçik ağ vağ	Little egret	-	-	R
	Ardea alba	Böyük ağ vağ	Great white egret	-	-	WV
	Ardea cinerea	Boz vağ	Grey heron	-	-	R
	Tadorna ferruginea	Qırmızı ördək	Ruddy shelduck	-	-	R
	Anas platyrhynchos	Yaşılbaş ördək	Common mallard	-	-	R
	Anas crecca	Fitçi ördək	Common teal	-	-	WV
	Spatula clypeata	Enlidimdik ördək	Northern shoveler	-	-	WV
	Aythya ferina	Qırmızıbaş dalğıc	Common pochard	VU	NT	WV
	Aythya nyroca	Ağgöz dalğıc	Ferruginous duck	NT	VU	R
	Aegypius monachus	Qara kərkəs	Black vulture	NT	EN	R
	Gyps fulvus	Ağbaş kərkəs	Griffon vulture	LC	VU	R
	Gypaetus barbatus	Saqqalı kərkəs	Bearded vulture	NT	EN	R

№	Latin name	Local name	English name	Status		Seasonal status
				IUCN	ARDB	
	Aquila heliaca	İmperator qartalı	Eastern imperial eagle	EN	VU	R
	Aquila nipalensis	Çöl qartalı	Steppe eagle	EN	EN	M
	Circaetus gallicus	Adi ilanyeyən	Short-toed eagle	LC	EN	M
	Milvus migrans	Qara çalağan	Black kite	LC	LC	M
	Circus cyaneus	Tarla leyi	Hen harrier	-	-	WV
	Circus macrourus	Çöl leyi	Pallid harrier	VU	NT	M
	Circus aeruginosus	Bataqlıq leyi	Western marsh harrier	-	-	R
	Buteo rufinus	Çöl sarı	Long-legged buzzard	LC	Çəhrayı siyahı	R
	Buteo buteo	Adi sar	Common buzzard	-	-	R
	Accipiter nisus	Kiçik qırğı	Eurasian sparrowhawk	-	-	R
	Falco tinnunculus	Adi muymul	Common kestrel	-	-	R
	Falco cherrug	Ütəlgi	Saker falcon	EN	CR	R
	Francolinus francolinus	Turac	Balck francolin	LC	NT	R
	Gallinula chloropus	Adi su fərəsi	Common moorhen	-	-	R
	Porphyrio poliocephalus	Sultan quşu	Gray headed swamphen	LC	VU	R
	Fulica atra	Adi qaşqaldaq	Common coot	-	-	R / WV
	Tetrax tetrax	Adi bəzgək	Little Bustard	NT	NT	WV
	Chettusia leucura	Ağquyruq çökükdimdik	White-tailed lapwing	LC	VU	R
	Vanellus vanellus	Kəkilli cüllüt	Northern lapwing	EN	NT	R / WV
	Himantopus himantopus	Adi caydaq cüllüt	Black-winged stilt	-	-	R
	Tringa glareola	Boz otluq cüllütü	Wood Sandpiper	-	-	R

№	Latin name	Local name	English name	Status		Seasonal status
				IUCN	ARDB	
	Tringa totanus	Adi otluq cüllütü	Common redshank	-	-	WV
	Larus cachinnans	Xəzər qağayısı	Caspian gull	-	-	R
	Larus armenicus	İrəvan qağayısı	Armenian gull	-	-	R
	Chroicocephalus ridibundus	Göl qağayısı	Black-headed gull	-	-	R
	Columba palumbus	Alabaxta	Common wood pigeon	LC	VU	R
	Columba livia	Çöl göyərçini	Rock dove	-	-	R
	Columba oenas	Meşə göyərçini	Stock dove	-	-	R
	Streptopelia decaocto	Yaxalıqlı qurqur	Collared dove	-	-	R
	Slipopelia senegalensis	Kiçik qurqur	Laughing dove	-	-	R
	Athene noctua	Dam bayquşcuğu	Little owl	-	-	R
	Hirundo rustica	Kənd qaranquşu	Barn swallow	-	-	BV
	Galerida cristata	Kəkilli torağay	Crested lark	-	-	R
	Melanocorypha calandra	Çöl torağayı	Calandra lark	-	-	WV
	Alauda arvensis	Tarla torağayı	Skylark	-	-	R / WR
	Anthus pratensis	Çəmənlik antı	Meadow pipit	-	-	R
	Motacilla alba	Ağ çaydaçapan	White wagtail	-	-	R
	Motacilla flava	Sarı çaydaçapan	Yellow wagtail	-	-	M
	Sturnus vulgaris	Adi sığırçın	Starling	-	-	R
	Garrulus glandarius	Adi zığ-zığ	Jay	-	-	R
	Pica pica	Adi sağsağan	Magpie	-	-	R
	Pyrrhocorax pyrrhocorax	Qırmızıdimdik dolaşa	Red-billed chough	-	-	R

№	Latin name	Local name	English name	Status		Seasonal status
				IUCN	ARDB	
	Corvus frugilegus	Zağca	Rook	-	-	WV
	Corvus cornix	Ala qarğa	Hooded crow	-	-	R
	Corvus corax	Quzğun	Raven	-	-	R
	Corvus monedula	Dolaşa	Eurasian Jackdaw	-	-	R
	Phylloscopus collybita	Sinsin yarpaqgüdən	Common chiffchaff	-	-	R
	Oenanthe finschii	Qaraboyun çaxraqcıl	Northern wheatear	-	-	R
	Turdus merula	Qara qaratoyuq	Eurasian blackbird	-	-	R
	Phoenicurus ochruros	Qara odquyruq	Black redstart	-	-	R
	Erithacus rubecula	Şəfəq bülbülü	European robin	-	-	R
	Sitta neumayer	Kiçik qayalıq siitası	Western rock nuthatch	-	-	R
	Passer domesticus	Dam sərçəsi	House sparrow	-	-	R
	Passer hispnaiolensis	Qaradöş sərçə	Spanish sparrow	-	-	R
	Petronia petronia	Qayalıq sərçəsi	Rock sparrow	-	-	R
	Fringilla coelebs	Meşə sərçəsi	Common chaffinch	-	-	R / M
	Chloris chloris	Adi yaşılca	Common greenfinch	-	-	R
	Carduelis carduelis	Payız bülbülü	European goldfinch	-	-	R
	Emberiza calandra	Tarla vələmirquşu	Corn bunting	-	-	R
	Emberiza cia	Dağ vələmirquşu	Rock bunting	-	-	R

R – Resident / M – Migratory

WV – Winter visitor / BV – Breeding visitor

Table 6.14. Results of winter counting conducted in previous years at Varvara reservoir

№	Latin name	Local name	English name	January, 2023	January, 2024
	Tachybaptus ruficollis	Kiçik batağan	Little grebe	8	34
	Podiceps cristatus	Böyük batağan	Great crested grebe	14	6
	Pelicanus crispus	Qıvrımlələk qutan	Dalmatian pelican		62
	Phalacrocorax carbo	Böyük qarabatdaq	Great cormorant	12	25
	Microcarbo pygmaeus	Kiçik qarabatdaq	Pygmy cormorant	650	227
	Egretta garzetta	Kiçik ağ vağ	Little egret		4
	Ardea alba	Böyük ağ vağ	Great white egret		2
	Ardea cinerea	Boz vağ	Grey heron	2	8
	Cygnus cygnus	Harayçı qu quşu	Whooper swan	2	
	Anas platyrhynchos	Yaşılbaş ördək	Common mallard	50	34
	Anas crecca	Fitçi ördək	Common teal	280	213
	Anas phenelope	Marek ördəyi	Eurasian wigeon		12
	Mareca strepera	Boz ördək	Gadwall		8
	Spatula clypeata	Enlidimdik ördək	Northern shoveler	65	21
	Netta rufina	Qırmızıdimdik dalğıc	Red-crested Pochard	36	24
	Aythya ferina	Qırmızıbaş dalğıc	Common pochard	35	80
	Aythya nyroca	Ağgöz dalğıc	Ferruginous Duck	30	
	Circus aeruginosus	Bataqlıq leyi	Western marsh harrier	6	8
	Francolinus francolinus	Turac	Balck francolin		10
	Fulica atra	Qaşqaldaq	Eurasian coot	25	99
	Gallinula chloropus	Adi su fərəsi	Common moorhen	32	13

№	Latin name	Local name	English name	January, 2023	January, 2024
	Porphyrio poliocephalus	Sultan quşu	Gray headed swamphen	5	10
	Chettusia leucura	Ağquyruq çökükdimdik	White-tailed lapwing	38	11
	Himantopus himantopus	Caydaq cüllüt	Black-winged stilt	30	2
	Chroicocephalus ridibundus	Göl qağayısı	Black-headed gull	95	50
	Alcedo atthis	Adi balıqcıl	Common kingfisher	1	2
	Corvus frugilegus	Zağca	Rook	120	250
	Corvus cornix	Ala qarğa	Hooded crow	25	12

B. Summary of field survey results

In fulfilment of the BMP requirements, the Contractor had hired a qualified ornithologist to implement seasonal migratory and resident bird surveys in the Project AoI. The surveys had covered the Project AoI sections passing through the territories of Mingachevir, Aghdash, Goychay, Aghsu, Kurdamir, Hajigabul and Garadagh districts. The surveyed areas were represented by the following landscapes/habitat types:

Wetland areas of Varvara water reservoir;

Mid-mountainous and agricultural areas of Aghdash, Goychay, Aghsu and Kurdamir districts

Semi-deserts of Hajigabul and Garadagh districts.

The purpose of the surveys was to conduct pre-construction ornithological monitoring and identify migratory and resident bird species found in the Project Aoİ. The surveys included collection of primary field materials using the route (transect) survey method in the project area, study of species with global and national threat status and identification of their main habitats, implementing critical habitat studies, and determination of detailed site-specific mitigation measures and environmental risks. Observations were conducted at the below intersections of all migration corridors (MC) with OHL routes (width of each MC covers a strip of ~2km at all points):

1. Khaldan – Sheki highway
2. Turyanchay valley – Aghdash-Gabala Road / Turyanchay Hydro Junction

   Goychay Valley – northern part of Goychay district
3. Girdimanchay Valley – southern part of Kulullu village
4. Ranjbar – Gubalibaloghlan road / near the entrance to Ranjbar village
5. Gobustan – Absheron / Papagdagh and near Gobustan Power Station

Description of transect and vantage points is provided below:

- Route 1 – Mingachevir - Varvara Water Reservoir - Khaldan Sheki Road ~ 25 km
- Route 2 – Khaldan Sheki Road – Turyanchay Hydro Junction ~ 31 km
- Route 3 – Turyanchay Hydro Junction – Goychay Gorge - Northern part of Bigir village ~ 34 km
- Route 4 – Northern part of Bigir village – Garamaryam village - Girdimanchay Valley ~ 26 km
- Route 5 – Girdimanchay Valley – Aghsu-Bico Road ~ 19 km
- Route 6 – Aghsu-Bico Road – Langebiz Village - Garachukha Piri ~ 34 km
- Route 7 – Garachukha Piri – Udulu Road ~ 26 km
- Route 8 – Udulu Road – Northern part of Hajigabul district – Ranjbar village - Navahi village ~ 35 km
- Route 9 – Navahi village – Atbulag village - Papagdagh ~ 40 km
- Route 10 – Papagdagh – Gobustan Power Station ~ 28 km

Table 6.15. Coordinates of vantage points

#	Location	Name	N	E
1	Mingachevir-Varvara road	OP 1	40°43'1.73"	47° 5'2.43"
2	II Arab	OP 2	40°39'32.65"	47°40'53.77"
3	Goychay-Garamaryam road	OP 3	40°37'18.37"	47°53'54.32"
4	Garamaryam village	OP 4	40°35'55.78"	47°59'55.13"
5	Aghsu-Dashdamirbayli road	OP 5	40°32'25.13"	48°25'1.36"
6	Gashad village	OP 6	40°29'0.53"	48°33'55.44"
7	Farms	OP 7	40°21'47.85"	48°42'11.48"
8	Akhtarma-Pashali Mud volcano	OP 8	40° 9'58.39"	48°49'49.81"
9	Kichik-Harami Mud volcano	OP 9	40° 4'31.76"	48°57'12.00"
10	Navahi settlement	OP 10	40° 1'38.48"	49° 9'44.34"
11	Atbulag village	OP 11	39°59'1.77"	49°16'35.76"

During the field studies, sensitive areas crossed by or located within the direct impact area of the Project facilities were visited, mapped and characterized. The table below lists the identified sensitive bird areas to be crossed by the transmission line, along with their kilometer chainage, total length, and sensitivity characteristics. Location maps of the areas are provided in Figures 6.24-6.27.

Table 6.16. Sensitive bird areas amd migration corridors along the Project's OHLs

Sensitive areas										
	Start			Finish			OHL	Length of section and Chainage (km), as per the design alignment	Type of sensitivity	Specific mitigation measures
		N	E		N	E				
SA1	Huruushagi-Salahli	40°42'19.92"	47° 2'57.95"	Havali-Hajiselli	40°44'1.63"	47° 6'38.66"	Azerbaijan TPP (Mingachevir) to Navahi SS, 500 kV	6 Km 215,5-221,5 km	Varvara Reservoir wetland (where birds of many species are concentrated); risk of bird collisions and disturbance to nesting	Bird Flight Diverters. Time-of- year restriction on construction work: 1 April to 31 July (birds nesting).
SA2	Arabbasra (Turyanchay Reserve)	40°48'34.34"	47°13'11.31"	Turyanchay (Turyanchay Reserve)	40°42'58.99"	47°32'59.95"	Azerbaijan TPP (Mingachevir) to Navahi SS, 500 kV	2 Km 202-204 km	Proximity (1 km or more) to a protected area (Turyanchay Reserve)	None needed (except at MC2, see below)
SA3	İkinci Udullu	40°16'54.36"	48°47'21.42"	Kichik-Harami Mud volcano	40° 4'49.11"	48°57'15.08"	Azerbaijan TPP (Mingachevir) to Navahi SS, 500 kV	25 km 24,5 – 49,5 km	Raptor and Little Bustard feeding area	Bird Flight Diverters

SA4	Papagdagh	40°13'53.85"	49°19'15.36"	Ceyildag	40°14'17.60"	49°20'2.44"	Absheron-Garadagh WPP - Navahi SS, 330 kV	2,1 km 28,2 – 30,3 km	Saker Falcon nesting site. (Also MC5 migration corridor)	Locate pylons so that none of them are in front of Papagdagh Hill. Bird Flight Diverters. Time-of- year restriction on construction work: 1 April to 31 July (birds nesting). Monitoring of the falcons' nesting success.
SA5	Girdagh Mud volcano	40°26'28.94"	49°27'25.77"	Girdagh Mud volcano	40°24'57.19"	49°28'43.75"	Absheron-Garadagh WPP to Navahi SS, 330 kV	1,5 km 57,6 – 59,1 km	Vulture feeding area; raptor nests nearby	Bird Flight Diverters
Migration corridors (MC)										
	Start			Finish			OHL	Chainage (km), as per the design alignment	Type of risk	Specific mitigation
		N	E		N	E				
MC 1	Gulovsha village	40°44'55.07"	47°11'27.14"	Yukhari Bujag village	40°45'18.40"	47°12'51.80"	Azerbaijan TPP to Navahi SS, 500 kV	2 km 171 – 173 km	Cranes and other migratory birds.	Bird Flight Diverters

MC 2	Turyanchay village	40°42'23.67"	47°31'56.90"	Turyanchay village	40°41'52.17"	47°33'12.53"	Azerbaijan TPP to Navahi SS, 500 kV	2.1 km 170 – 173 km	Migrating birds, especially raptors and geese	Bird Flight Diverters
MC 2.1	Goychay town (Goychay river)	40°40'23.04"	47°44'43.04"	Goychay city(Goychay river)	40°40'18.93"	47°46'4.66"	Azerbaijan TPP (Mingachevir) to Navahi SS, 500 kV	3 km 151 – 154 km	Migrating birds; also resident vultures and eagles	Bird Flight Diverters
MC 3	Girdimanchay river	40°34'39.54"	48°11'27.49"	Girdimanchay river	40°34'23.50"	48°12'29.20"	Azerbaijan TPP (Mingachevir) to Navahi SS, 500 kV	2 km 111 – 113 km	Migrating birds, including many Steppe Eagles	Bird Flight Diverters
MC 4	Ranjbar village (Pirsaatchay river)	40° 4'29.53"	49°2'6.46"	Ranjbar village (Pirsaatchay river)	40° 4'37.09"	49° 3'44.33"	Azerbaijan TPP to Navahi SS, 500 kV	25 km 24,5 – 49,5 km	Migrating birds, especially raptors and passerines (songbirds)	Bird Flight Diverters
MC 5	Papagdag	40°14'30.83"	49°19'4.50"	Ceyildag	40°14'40.99"	49°20'26.60"	Absheron SS - Navahi SS OHL 500 kV	2,1 km 28,2 – 30,3 km	Migrating birds.	Bird Flight Diverters
MC 5.1	Gobu power station	40°26'26.32"	49°26'50.76"	Gobu power station	40°26'48.90"	49°28'13.36"	Absheron-Garadagh WPP to Gobu SS, 330 kV	5 km 3,2 – 8,2 km 5,1 km 12 – 17 km	Migrating birds	Bird Flight Diverters
MC 6	Caspian Sea coastal plain						Alat FEZ SS to Navahi SS 330 KV	16 km 4 – 7 km 9,5 - 22 km	Many migrating birds	Bird Flight Diverters

During the survey, the Varvara Reservoir, Turyanchay NSR, the part of the Bozdagh range in the Hajigabul district, Papagdagh and the rocky area near the Gobustan SS were assessed as sensitive habitats. The mentioned areas are suitable for nesting of various species of birds and several nesting sites were recorded during the observations (Fig. 6.24-6.27).

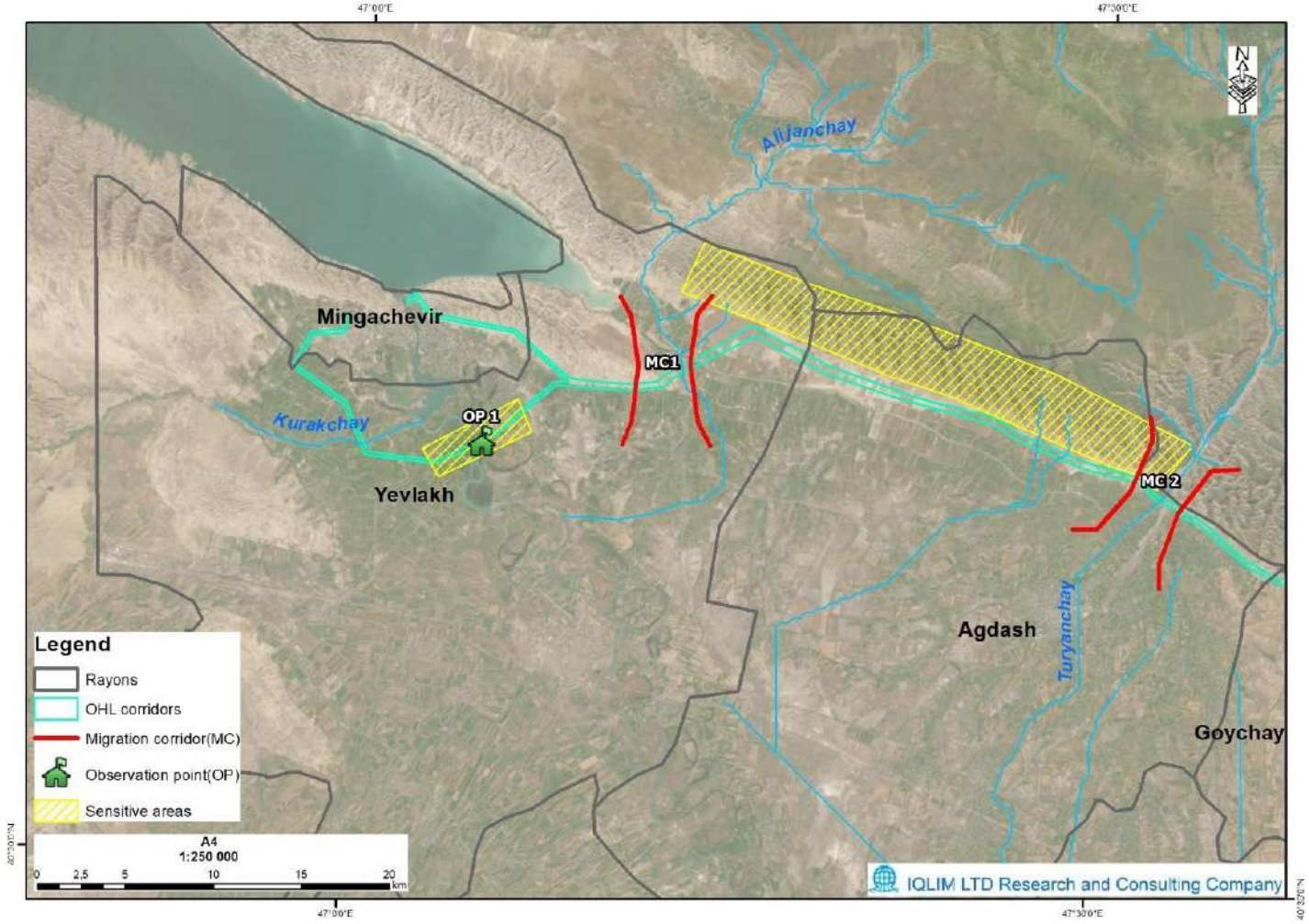


Figure 6.23: Sensitive habitats and migration corridors: MC 1 and MC 2

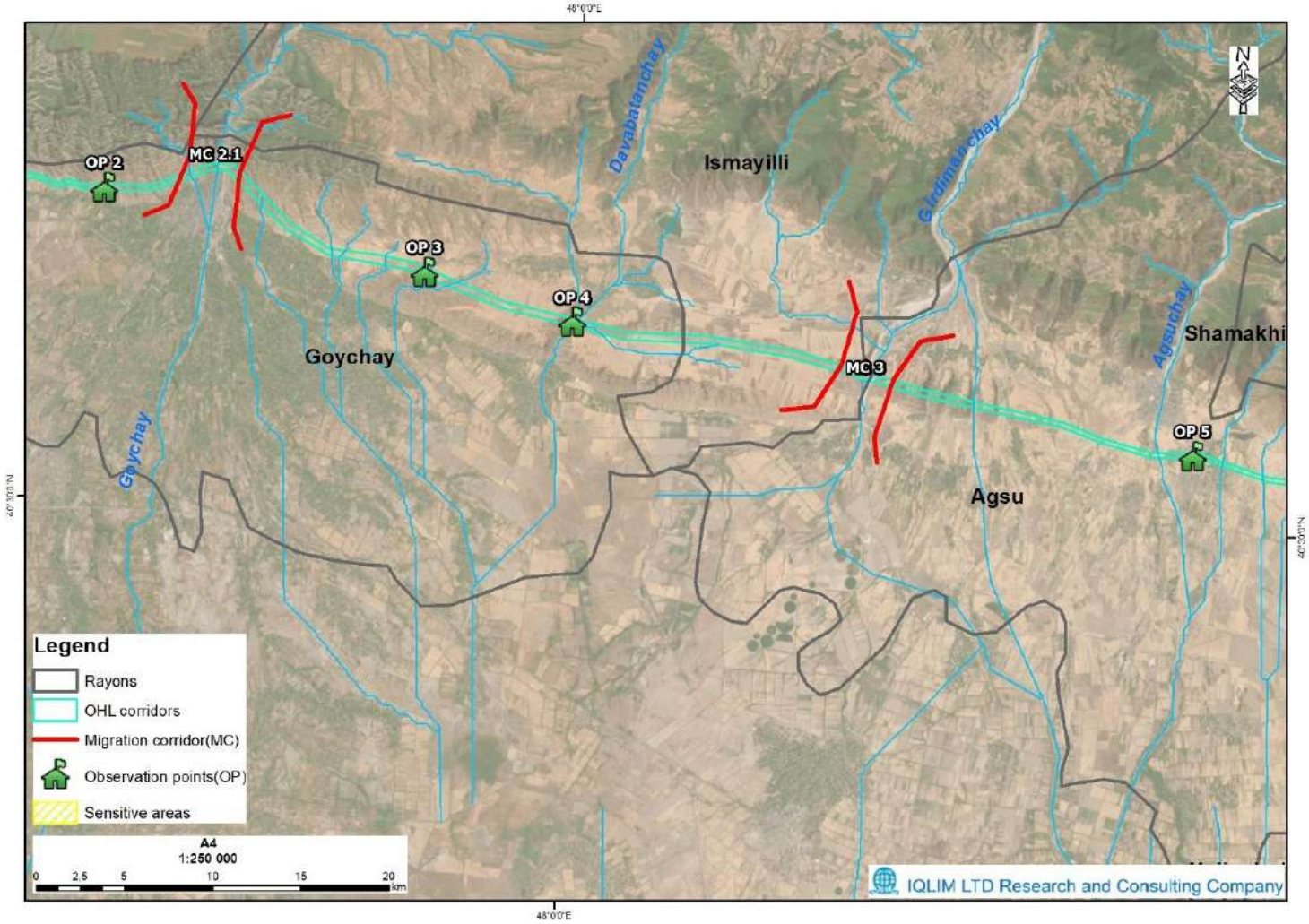


Figure 6.14: Sensitive habitats and migration corridors: MC 2 and MC 3

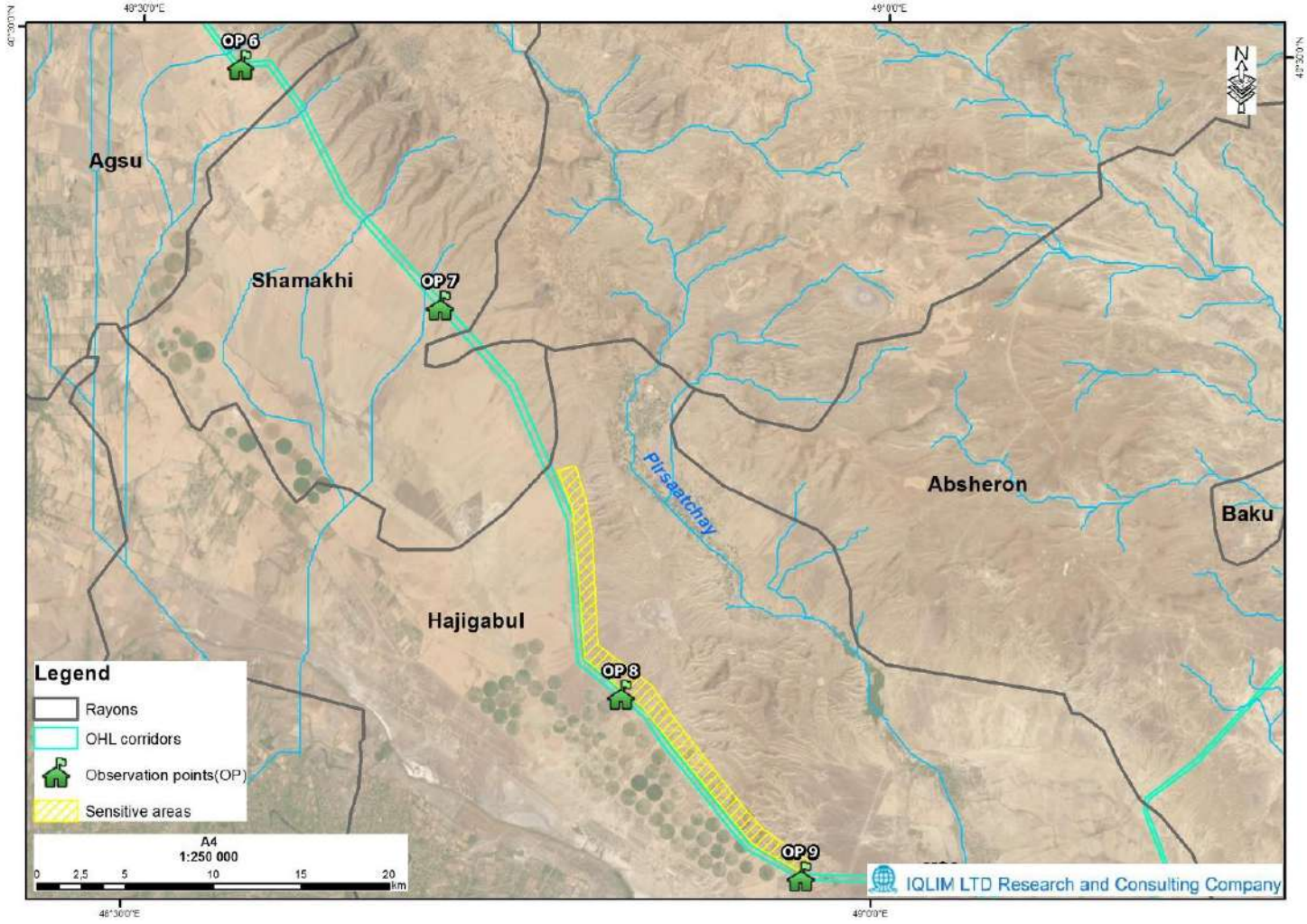


Figure 6.25: Sensitive habitats and migration corridors: Bozdagh range

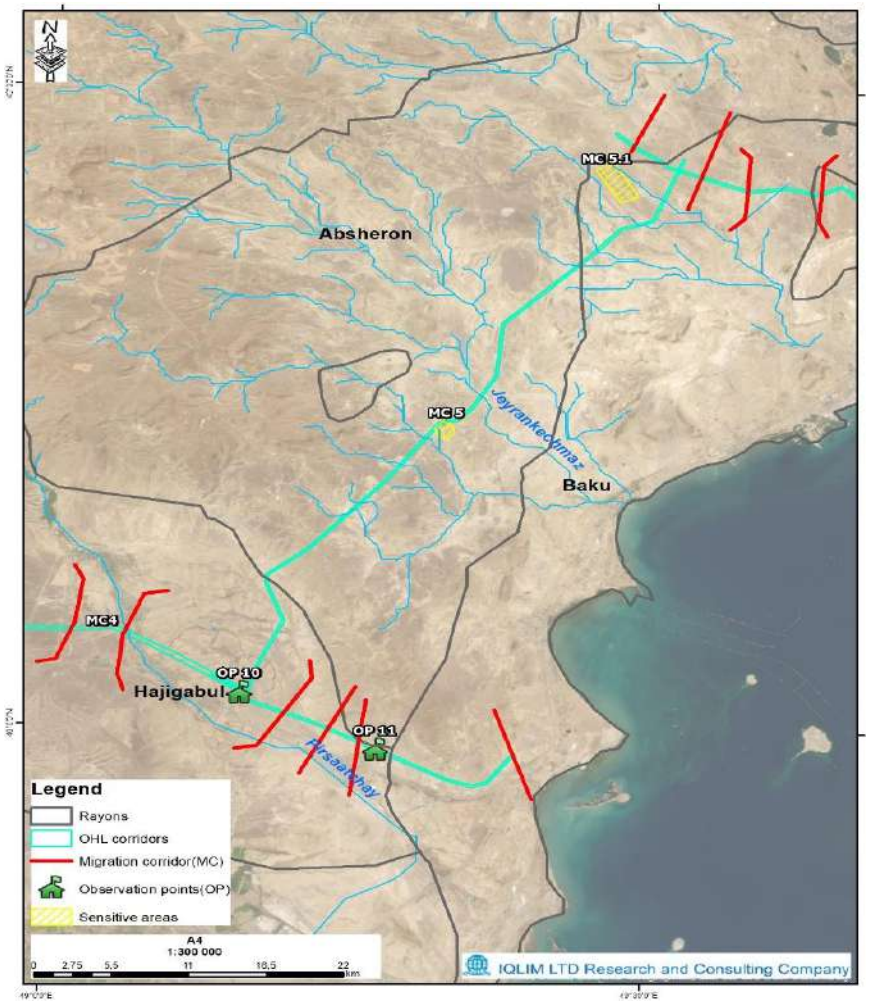


Figure 6.26: Sensitive habitats and migration corridors: Papagdagh and area near the Gobustan SS

The migration corridors and other sensitive areas identified by the surveys will require specific mitigation measures during Project construction and/or operation. The table below indicates the geographic coordinates of these identified sensitive areas,

Table 6.1. Coordinates of migration corridors and other sensitive areas detected within and in the vicinity of the Project AoI

Sensitive areas						
	Start			Finish		
		N	E		N	E
SA1	Huruushagi-Salahli	40°42'19.92"	47° 2'57.95"	Havali-Hajiselli	40°44'1.63"	47° 6'38.66"
SA2	Arabbasra(Turyanchay Reserve)	40°48'34.34"	47°13'11.31"	Turyanchay(Turyanchay Reserve)	40°42'58.99"	47°32'59.95"
SA3	İkinci Udullu	40°16'54.36"	48°47'21.42"	Kichik-Harami Mud volcano	40° 4'49.11"	48°57'15.08"
SA4	Table Mountain (Papagdag)	40°13'53.85"	49°19'15.36"	Table Mountain	40°14'17.60"	49°20'2.44"
SA5	Girdagh Mud volcano	40°26'28.94"	49°27'25.77"	Girdagh Mud volcano	40°24'57.19"	49°28'43.75"
Migration corridors (MC)						
	Start			Finish		
		N	E		N	E
MC 1	Gulovsha village	40°44'55.07"	47°11'27.14"	Yukhari Bujag village	40°45'18.40"	47°12'51.80"
MC 2	Turyanchay village	40°42'23.67"	47°31'56.90"	Turyanchay village	40°41'52.17"	47°33'12.53"
MC 2,1	Goychay city(Goychay river)	40°40'23.04"	47°44'43.04"	Goychay city(Goychay river)	40°40'18.93"	47°46'4.66"
MC 3	Girdimanchay river	40°34'39.54"	48°11'27.49"	Girdimanchay river	40°34'23.50"	48°12'29.20"
MC 4	Ranjbar village (Pirsaatchay river)	40° 4'29.53"	49° 2'6.46"	Ranjbar village (Pirsaatchay river)	40° 4'37.09"	49° 3'44.33"
MC 5	Table Mountain (Papagdag)	40°14'30.83"	49°19'4.50"	Table Mountain	40°14'40.99"	49°20'26.60"
MC 5,1	Gobu power station	40°26'26.32"	49°26'50.76"	Gobu power station	40°26'48.90"	49°28'13.36"

Autumn surveys

The first round of the surveys was conducted during weekends between October 05 and November 10, 2024.

The first round of the surveys was conducted during weekends between October 05 and November 10, 2024.

During the survey, on the rocky hill called Papagdagh on Route 9 (N 40.236060 / E 49.327005), a nest was detected of the Saker Falcon *Falco cherrug* (globally Endangered). The nest was active and has been used since at least 2021for several years. It is one of only 2 known nests for this species in Azerbaijan and is thus of special conservation importance.

On Route 10, nests of the Long-legged Buzzard *Buteo rufinus* and Lesser Kestrel *Falco naumanni* were found.

Also, on Routes 7 and 8, several large nests were recorded in various places near the section of the Bozdag range where the power lines will pass. However, since the survey was outside the nesting period, it is difficult to say which species these nests belong to, and it is recommended to conduct new observations during the 2025 nesting period.
Information on the species composition and number of birds recorded along the routes and migration corridors during the survey is shown in Table 6.16 below.
During the ornithological survey, a total of 77 bird species were recorded in the areas where the planned power lines will pass, of which 17 species (*Aythya ferina* - Common pochard, *Aythya nyroca* - Ferruginous duck, *Gypaetus barbatus* - Bearded vulture, *Aegypius monachus* - Black vulture, *Gyps fulvus* - Griffon vulture, *Aquila heliaca* - Imperial eagle, *Aquila nipalensis* - Steppe Eagle, *Circaetus gallicus* - Short-toed eagle, *Milvus migrans* - Black Kite, *Circus macrourus* - Pallid harrier, *Falco cherrug* - Saker falcon, *Francolinus francolinus* - Black francolin, *Porphyrio poliocephalus* - Gray headed swamphen, *Tetrax tetrax* – Little bustard, *Chettusia leucura* - White-tailed lapwing, *Vanellus vanellus* - Norhern Lapwing and *Columba palumbus* - Wood pigeon) are included in the 3rd edition of the Red Book of the Republic of Azerbaijan, One species (Buteo rufinus – Long-legged buzzard) is on Azerbaijan's Pink List of near-threatened species.

Table 6.2. Species composition and number of birds encountered along transects and migration corridors

Local name	English name	M1	M2	M3	M4	M5	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	Flight direction	Altitude (m)	Behaviour
Kiçik batağan	Little grebe						65										Sitting	0	Feeding
Böyük batağan	Great crested grebe						4										Sitting	0	Feeding
Böyük qarabatdaq	Great cormorant						120										Different directions	0 - 70	Flight, feeding
Kiçik qarabatdaq	Pygmy cormorant						35										Different directions	0 - 70	Flight, feedin
Adi qarıldaq	Night heron						4										Sitting on reed	5	Roosting
Kiçik ağ vağ	Little egret						15										Sitting	0	Feeding
Böyük ağ vağ	Great white egret						8										Sitting	0	Feeding
Boz vağ	Grey heron						19										Sitting	0	Feeding
Qırmızı ördək	Ruddy shelduck						27										Sitting	0	Feeding
Yaşılbaş ördək	Common mallard						110										Sitting	0	Feeding Rusting
Fitçi ördək	Common teal						42										Sitting	0	Feeding Roosting
Enlidimdik ördək	Northern shoveler						12										Sitting	0	Feeding
Qırmızıbaş dalğıc	Common pochard						8										Sitting	0	Feeding
Ağgöz dalğıc	Ferruginous duck						6										W	50	Flight
Qara kərkəs	Black vulture	1	4	2				1		1			1			4	Different directions	100-200	Flight
Ağbaş kərkəs	Griffon vulture	1	12	4				2	1	1		3		1	2	6	Different directions	100-200	Flight
Saqqallı kərkəs	Bearded vulture			2													Sitting N	200-250	Rusting Flight
İmperator qartalı	Eastern imperial eagle	2	6	1				1	1			1			3	2	Different directions	100-200	Flight
Çöl qartalı	Steppe eagle	4	18	6											12	8	S	100-150	Flight
Adi ilanyeyən	Short-toed eagle				1										1		S	100-150	Flight
Qara çalağan	Black kite					1										1	SE	100-150	Flight

Local name	English name	M1	M2	M3	M4	M5	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	Flight direction	Altitude (m)	Behaviour
Tarla leyi	Hen harrier		1	1	1	2				1			1		1	1	Different directions	100-200	Flight
Çöl leyi	Pallid harrier				1										1		S	200	Flight
Bataqlıq leyi	Western marsh harrier						8									1	Sitting Different directions	50-100	Roosting Flig
Çöl sari	Long-legged buzzard	1	3	1	2	2		1		1	2	1		1	3	1	Sitting Different directions	50-100	Roosting Flig
Adi sar	Common buzzard		1	1	1			1									Different directions	100-150	Flight
Kiçik qırğı	Eurasian sparrowhawk	1	3	2	2	2		1	2	1	1		1	2	1	1	Different directions	50-150	Flight
Adi muymul	Common kestrel	1	1	1	2	3		1	2	1	1	2	4	1	3	2	Sitting Different directions	50-100	Roosting Flig Hovering
Ütəlgi	Saker falcon				1												Around nest N	100-150	Flight
Turac	Black francolin				6		8										N/A	0	Feeding
Adi su fərəsi	Common moorhen						36										Sitting	0	Feeding Roosting
Sultan quşu	Gray headed swamphen						2										N/A	0	Feeding
Adi qaşqaldaq	Common coot						360										Sitting	0	Feeding Roosting
Adi bəzgək	Little Bustard						620										W	100-150	Flight
Ağquyruq çökükdimdik	White-tailed lapwing						2										Sitting	0	Feeding
Kəkilli cüllüt	Northern lapwing				8		12										S Sitting	0 - 50	Feeding Flig
Adi caydaq cüllüt	Black-winged stilt						32										Sitting	0	Feeding Roosting
Boz otluq cüllütü	Wood Sandpiper						4										Sitting	0	Feeding

Local name	English name	M1	M2	M3	M4	M5	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	Flight direction	Altitude (m)	Behaviour
Adi otluq cüllütü	Common redshank						6										Sitting	0	Feeding
Xəzər qağayısı	Caspian gull															520	NE	50-150	Flight
İrəvan qağayısı	Armenian gull						45										E	50-150	Flight
Göl qağayısı	Black-headed gull						350							60		250	Sitting Different directions	50-100	Roosting Feeding Fligh
Alabaxta	Wood pigeon	10	150	25													Different directions	50-100	Flight
Çöl göyərçini	Rock dove	120	250	320	80	160	350										Different directions	50-100	Flight
Meşə göyərçini	Stock dove		60	20		45											Different directions	50-100	Flight
Yaxalıqlı qurqur	Collared dove	2	8	15	6	4	8		4	2		6	3	2			Sitting Different directions	0 - 50	Feeding Flight
Kiçik qurqur	Laughing dove	1	3						2								Sitting	0	Feeding
Dam bayquşcuğu	Little owl												1	1	1		Sitting	0	Roosting
Kənd qaranquşu	Barn swallow	10		5													S	50	Flight
Kəkilli torağay	Crested lark						2	3	1	1	4	1	5	1	3	6	Sitting	0	Feeding
Çöl torağayı	Calandra lark				250	150							60			120	Sitting Different directions	0 - 50	Feeding Flight
Tarla torağayı	Skylark												15		25	60	Sitting Different directions	0 – 50	Feeding Flight
Çəmənlik antı	Meadow pipit				75					6				12			S	50	Flight
Ağ çaydaçapan	White wagtail		40	6		10								25			Sitting Different directions	0 – 50	Feeding Flight
Sarı çaydaçapan	Yellow wagtail				120	15								20		15	S	50 – 80	Flight

Local name	English name	M1	M2	M3	M4	M5	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	Flight direction	Altitude (m)	Behaviour
Adi sığırçın	Starling	300	60	120	450	1200	60	40	125	250	170	350	100	60	85	650	Sitting Different directions	0 – 50	Feeding Flight
Adi zığ-zığ	Jay		4														N	80	Flight
Adi sağsağan	Magpie	2	6	4	10	2	1	3	6	4	5	1	8	2	4	2	Sitting Different directions	0 – 50	Feeding Flight
Qırmızıdimdik dolaşa	Red-billed chough		12		6	15								6	8	12	Sitting Different directions	50 – 100	Feeding Roosting Flight
Zağca	Rook	120	250	85	650	1600	40	25	35	150	120	85	90	145	180	350	Sitting Different directions	50 – 100	Feeding Roosting Flight
Ala qarğa	Hooded crow	4	12	8	16	25	2	6		8	21	17	23	6	12	45	Sitting Different directions	50 – 100	Feeding Roosting Flight
Quzğun	Raven		2	1	4	2	1		2	1		1	4	1	1	3	Sitting Different directions	50 – 100	Feeding Roosting Flight
Dolaşa	Eurasian Jackdaw		25	10					12								Different directions	50 – 80	Flight
Sinsin yarpaqgüdən	Common chiffchaff		2			2								1	1		N/A	5	Feeding
Qaraboyun çaxraqcıl	Northern wheatear				2	3								1	3	4	Sitting Different directions	0 – 30	Feeding
Qara qaratoyuq	Eurasian blackbird		2	1	3			2				2		1			Different directions	50 – 80	Flight
Qara odquyruq	Black redstart					2								1	2	2	Sitting	0	Feeding
Şəfəq bülbülü	European robin		1						2			1					Sitting	0	Feeding
Kiçik qayalıq sittası	Western rock nuthatch				2										2	2	Sitting	0	Feeding Roosting

Local name	English name	M1	M2	M3	M4	M5	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	Flight direction	Altitude (m)	Behaviour
Dam sərçəsi	House sparrow	25	135	85	250	70	20	15	12	35	40	75	6	12	120	25	Sitting Different directions	0-50	Feeding Flight
Qaradöş sərçə	Spanish sparrow	12	25	6						80					75	16	Sitting Different directions	0-50	Feeding Flight
Qayalıq sərçəsi	Rock sparrow					4									2	4	Sitting	0	Feeding
Meşə sərçəsi	Common chaffinch	25	12	10	1350	20	2	8	6	12	2			25	6	35	Sitting S	0-80	Feeding Fligl
Adi yaşılca	Common greenfinch		2		1					2				3			Different directions	20 – 50	Flight
Payız bülbülü	European goldfinch	2	16	10	25	6		4		7		3	2	3		4	Sitting Different directions	0-50	Feeding Flight
Tarla vələmirquşu	Corn bunting	1	3	8	35	6	1		1		2		6	12	2	1	Sitting Different directions	0-50	Feeding Flight
Dağ vələmirquşu	Rock bunting						1							1	1	1	Sitting	0	Feeding

6.11. Landscape Visual Perception

This section provides the characteristics of existing landscape types in the area where the AZURE Project will be implemented. Whereas topographic features, formation processes, landcover, biodiversity and other parameters of the Project area's landscapes are described in the relevant chapters of current ESIA, this paragraph is dedicated to their pre-project visual and esthetical perception disclosed from the viewpoint of the local population and other stakeholders. This study will provide the basis for assessing the visual impact on the landscape and its aesthetic features (it will be conducted under the ESIA).

6.11.1. "Azerbaijan TPP – Navahi SS" and "Alat FEZ – Navahi SS" OHLs

Being the most extended part of the Study area, the corridor comprising both OHLs runs along the boundary between predominantly flat landscapes of the Shirvan lowland from one side, and hilly low mountain landscapes of the Ajinohur-Langabiz ranges from the other. According to their visual and esthetical peculiarities, there are the following major landscape types within the Project area's boundaries:

1) The vast predominantly flat but in some places slightly wavy landscapes of the Shirvan lowland
2) Low-altitude mountainous landscapes of Ajinohur, Khoshavend, Garamaryam and Langabiz ranges
3) Intermontane valley landscapes formed by the folds and river valleys of the Ajinohur-Langabiz area
4) Alluvial cone landscapes constituted by the main rivers of the Study area
5) Anthropogenic industrial landscapes formed by the industrial enterprises operating in and around the Study area, including power plant and station facilities of AzerEnerji;
6) Cultural landscapes formed by the settlements and agricultural lands situated along and close to the Study area.

A. Natural landscapes

1. Plain landscapes. Plain landscapes occupying vast areas between the left bank of Kur river and the foothills of Ajinohur, Khoshavend, Garamaryam and Langabiz ranges are represented by predominantly semidesert semi-natural and partly natural landscapes of the Shirvan lowland. Value of these landscapes is mainly explained by their productive features, as the largest-in-area semi-natural and anthropogenic landscapes of the lowland are intensively used for agriculture and housing. Relatively smaller part of these landscapes are valuable in terms of biodiversity and scientific importance, being represented mainly by the territory of Shirvan National Park, and the spots of undisturbed semidesert steppes encountered at some places along the OHL corridors.

2. Riverine landscapes. Being the second most important landscape type of the Shirvan lowland, the riverine landscapes are represented by the downstream valley of Kur and the lower reach valleys of

Alijanchay, Turyanchay, Goychay, Girdimanchay and Aghsuchay rivers. These landscapes, especially the river valley of Kur, are valuable in terms of their productive, scenic and, especially in the areas with preserved Riparian forests, ecological and biodiversity importance. Another important category of the riverine landscapes detected in the Study area is represented by the middle-reach valleys and alluvial cones of Alijanchay, Turyanchay, Goychay, Girdimanchay and Aghsuchay rivers. All these cones are characterized by high ecological, scenic and productive values.

3. Mountain-steppe and mountain-shrubby landscapes of the Study area are represented by vast parts of the along-OHL ranges covered with grasslands with typical mountain-steppe vegetation. These landscapes are characterized by exceptional scenic and productive value. The scenic value of the mountain-steppe landscapes is explained by beautiful views opening to these landscapes from the lowland and by even more beautiful sceneries opening from the steppe-covered slopes to the lowland and other neighboring mountain slopes. The productive value of such landscapes is due to their intensive use for the pastoral farming.

4. Mountain-rock landscapes are developed along the steep southern slopes and on badland parts of the Study area ranges, and on both sides of the intermontane river valleys of Turyanchay, Goychay and Girdimanchay. These landscapes are valuable in terms of their scenic features, scientific importance and visual diversity.

A. Semi-natural and anthropogenic landscapes

1. Natural landscapes changed by a human activity. Such landscapes occupy vast majority of the Study area and are represented by the agricultural lands of the Shirvan lowland and the piedmont areas of Ajinohur-Langabiz low-mountain zone. These landscapes are of an exceptionally high productive and ecological importance.

2. Cultural landscapes. Formed by the towns and villages situated within the Study area, these landscapes are the second-most-important cultural landscape category in terms of their visual perception. These landscapes are valuable in terms of their productive and social importance, as well as the scenic properties disclosed both from the higher-altitude parts of the Shirvan lowland, and especially from the slopes and tops of the low-mountain areas in the north.

3. Industrial landscapes. This landscape category is mainly represented by the photosque facilities of “Azerbaijan” TPP and “Mingachevir” HPP. Their value is explained by the productive importance and the scenic properties.

“Absheron-Garadagh WPP – Navahi SS”, “Absheron-Garadagh WPP – Gobu SS” OHLs

Situated almost entirely on the low and middle altitude mountain of the Eastern Gobustan, both OHL corridors are characterized by wide diversity of natural and semi-natural landscapes, whereas the fact that

the OHLs are extended along sparsely populated semideserts, they have the least developed anthropogenic and landscapes.

A. Natural landscapes

1. Volcanic landscapes are a type of mountain landscape that is fixed throughout the Study area and has the most beautiful visual appearance. These landscapes are represented by low mountains and hills formed by craters, salsas, and griffons of the mud volcanoes existing vicinity of the Study area. These landscapes have exceptional value due to their scenic and recreational properties, as well as scientific and ecological importance.

2. Mountainous and hilly landscapes. Occupying almost an entire part of the OHL corridors, low and middle altitude mountains and hills are valuable due to their productive features (mountains of the Eastern Gobustan are widely used as winter pastures) and scenic properties.

3. Intermontane valley landscapes. The valleys that exist all across the OHL corridors, were formed mainly due to the long-term erosional processes, and, in case of Pirsaat valley, historical activity of the rivers. These landscapes are of very high value thanks to their scenic and ecological properties.

4. Plain landscapes. Occupying a limited small part of the corridors, these landscapes are represented by the are to the north of Navahi SS. Confined to a boundary between the Shirvan lowland and the foothills of the Alat range, these landscapes are bearing scenic and productive value.

B. Semi-natural and anthropogenic landscapes

1. Semi-natural landscapes are represented by the agricultural lands present on part of the plain landscape of the Navahi outskirts, as well as several farmlands situated along the OHL corridors and the larger farmlands situated near Gobu and Gobustan settlements. These landscapes are valuable due to their productive and partly scenic properties.

2. Cultural landscapes are represented by Navahi settlement in the south, and by Gobu and Gobustan settlements in the north. The value of these landscapes is high due to their of their productive and social importance, and by the scenic properties disclosed from the surrounding hills.

6.12. Ecosystem Services

The Study area as a whole and separate OHL corridors separately are characterized by the presence of a broad variety of valuable ecosystem services, belonging to the provisioning, regulating, cultural and supporting services. Detailed characteristics of the ecosystem services identified in the Study areas are given in the sections below.

6.12.1. Shirvan lowland

The Shirvan Lowland is an important agricultural and ecological region characterized by dense population, great number of cultural and historical landmarks, and, of course the availability of fragile but relatively abundant irrigation water and arable soil resources. Natural and cultural environment of the lowland determine high-to-moderate value of quite a few key ecosystem services spread equally all across this component of the Study area. Detailed characteristics of the identified ecosystem services is given in Table 6.6 below.

Table 6.6. Major ecosystem services identified in the Shirvan lowland

Source	Importance	Service description	Service users
Provisioning services			
Agricultural goods	High	Shirvan lowland is the largest and one of the most important agricultural regions of Azerbaijan, characterized by high concentration of crop growing, gardening, livestock growing and food production facilities. Importance of agricultural goods is therefore the highest as the goods produced in the region are supplied to the whole range of local to national and foreign consumers.	Local: farmers, local communities, workers of agricultural facilities Regional: consumers from the neighboring districts National: consumers from the rest of Azerbaijan International: consumers from the states, where the agricultural goods are exported to
Fish resources	High	Kur river and irrigation canals have rich commercial fish resources. Therefore, the importance of this ecosystem service can be assessed as high	Local: local communities, fishermen Regional: fishermen, fishing companies and consumers from the neighboring districts National: consumers and companies from the other parts of Azerbaijan International: consumers from the states, where the fish products are exported to

Energy	High	Kur river is known as a water body with very rich hydropower generation potential. Moreover, the Shirvan lowland, especially the areas close to the Greater Caucasus foothills, are characterized by rich wind power generation capacity. Finally, well developed agriculture creates certain potential for the development of energy based on biomass. All these factors allow marking the energy production the second most important provisioning service provided by the lowland.	Local: local communities, farms and enterprises Regional: energy users from the neighboring districts National: energy users from the remote districts of Azerbaijan
Biodiversity	High	Given that part of the Project activities will be implemented in the direct vicinity of Shirvan National Park, and that there are several bird migration routes crossing the OHL corridors, the importance of the discussed ecosystem service can be assessed as high.	Local: local communities, species Regional: tourists and researchers from the neighboring districts National: tourists and researchers from the other parts of Azerbaijan International: foreign tourists and researchers
Grasslands	High	Some of the lands of the lowland, often in the piedmont areas around OHL corridors, are used as winter pastures. Provided that this service is benefited from by both local and regional users, its' importance was assessed as high.	Local: local communities and farmers Regional: farmers and shepherds from the neighboring districts
Regulating and supporting services			
Pollination	High	Annual and perennial plants naturally growing and cultivated on the Shirvan lowland are very important for pollination. Annuals typically germinate, grow, flower, and set seed within a single	Local, regional and country-wide ecosystems

		growing season, providing a rapid and reliable source of pollen and nectar for pollinators. Perennials provide consistent and reliable sources of pollen and nectar over multiple years, supporting pollinator populations throughout their entire life cycles. Many perennials offer additional benefits to pollinators, such as nesting sites, overwintering habitat, and shelter from predators.	
Regulatory potential of soils	High	As seen from Chapter 5.5, the lowland is characterized by a variety of arable soil types due to its diverse landscape and climate. Taking into account that the project will be implemented in areas that are widely used for agricultural purposes, the importance of the service is assessed as high.	Local: local communities, land users, ecosystems
Water quality	High	The Shirvan Lowland, despite its arid climate, provides some crucial water quality related ecosystem services, primarily through its wetlands and the Kur River. Thus, the range of services provided by the lowland's water bodies and wetlands include water purification, flood regulation, groundwater recharge, habitat provision and nutrient cycling. Important role played by these bodies and high demand in them from the region's energy and agricultural facilities make maximize the importance of this ecosystem service.	Local: local water users, ecosystems Regional: water users from the neighboring districts, regional ecosystems National: water users from the remote parts of the country
Air quality	Moderate	Despite its arid climate, the lowland provides some essential air quality-related ecosystem services. Importance	Local communities

		of the service were characterized as moderate.	
Cultural services			
Recreation and tourism	High	Territory of Shirvan National Park is an area within the Project affected parts of the lowland, characterized by the high-value recreation and tourism services.	Local: local communities Regional: tourists from the neighboring districts National and international: tourists from the other parts of the country and abroad
Spiritual and religious value	High	Settlements located along the OHL corridors have their cemeteries in the direct vicinity of the powerlines, and places of worship within their residential areas. Traditions of the project affected communities make this service of a high priority.	Local communities
Cultural heritage	High	There is a number of medieval and more recent historical monuments in a relative vicinity of the OHL corridors. The value of these monuments was assessed as high.	Local: local communities Regional: tourists from the neighboring districts National and international: tourists from the other parts of the country and abroad

6.12.2. Ajinohur-Langabiz low mountain zone

Low-altitude mountains of Ajinohur, Khoshavend, Garamaryam and Langabiz ranges are important both in terms of the people's livelihoods and sustainability of the regional biodiversity. Relatively less densely populated and used than the Shirvan lowland, these mountains are characterized by a different set and value gradation of the services provided by the zone's ecosystems. Detailed list and description of the ecosystem services in Ajinohur-Langabiz zone is given in Table 6.13 below.

Table 6.14. Major ecosystem services identified in the Ajinohur-Langabiz low mountains

Source	Importance	Service description	Service users
Provisioning services			
Agricultural goods	High	Although less developed than in the Shirvan lowland, agricultural sector of the low mountains is still important at the regional and national context. Thus, growing of cereals, fruits, vegetables and vineyards, as well as animal husbandry form important parts of the zone's economy.	Local: farmers, local communities, workers of agricultural facilities Regional: consumers from the neighboring districts National: consumers from the rest of Azerbaijan International: consumers from the states, where the agricultural goods are exported to
Biodiversity	High	Given that part of the Project activities will be implemented in the direct vicinity of Turyanchay State Nature Reserve, and that there are several bird migration routes crossing and natural habitats extending along the OHL corridors, the importance of the discussed ecosystem service can be assessed as high.	Local: local communities, ecosystems Regional: tourists and researchers from the neighboring districts National: tourists and researchers from the other parts of Azerbaijan International: foreign tourists and researchers
Grasslands	High	Different parts of the zone are widely used as winter and year-round pastures both by the zone residents and people from the surrounding plains. Provided that this service is benefited from by both local and regional users, its' importance was assessed as high.	Local: local communities and farmers Regional: farmers and shepherds from the neighboring districts
Energy	High	Middle reach basins of the zone's all main rivers have got rich potential for	Local: local communities, farms and enterprises

		establishing smaller hydropower and wind energy generation facilities. Therefore, importance of this service was characterized as high.	Regional: energy users from the neighboring districts
Fish resources	Moderate	Although less pronounced than in the main rivers of the Kur-Araz lowlands, large waterways of the zone are still known for the presence of fish resources used by local population.	Local: local communities, fishermen
Regulating and supporting services			
Pollination	High	Annual and perennial plants naturally growing and cultivated on the zone's mountains are very important for pollination.	Local, regional and country-wide ecosystems
Water quality	High	Alike the Shirvan lowland, the zone provides some crucial water quality and abundance related ecosystem services, primarily through its rivers and their alluvial cones. Importance of the service was assessed as high.	Local: local water users, ecosystems Regional: water users from the neighboring districts, regional ecosystems
Regulatory potential of soils	Moderate	Taking into account that the project will be implemented on relatively thin and vulnerable, but less used soil cover than in Shirvan lowland, importance of the service was characterized as moderate.	Local: local communities, land users, ecosystems
Air quality	Moderate	Alike the Shirvan lowland, the zone provides some essential air quality-related ecosystem services, primarily due to the altitudes and through its' grasslands and forests. Importance of the service were characterized as moderate.	Local communities
Cultural services			

Recreation and tourism	High	Territory of Turyanchay National Park, as well as photosque mountainous landscapes of the zone are characterized by the high-value recreation and tourism services.	Local: local communities Regional: tourists from the neighboring districts National and international: tourists from the other parts of the country and abroad
Cultural heritage	High	In the zone, there is a number of historical monuments of local and regional value. The value of these monuments was assessed as high.	Local: local communities Regional: tourists from the neighboring districts

6.12.3. Eastern Gobustan

The Eastern Gobustan, known for its semi-arid landscape and unique geological formations, provides a range of ecosystem services that are vital for both the environment and human well-being. Description of the identified services is provided in Table 6.14 below.

Table 6.14. Major ecosystem services identified in the Eastern Gobustan

Source	Importance	Service description	Service users
Provisioning services			
Agricultural goods	Medium	The Eastern Gobustan is one of the areas of great importance for nomadic farmers in Azerbaijan and is used as a wintering ground.	Local: local communities, farmers Regional: consumers and farmers from the neighboring and remote districts of the southeastern Greater Caucasus mountains and Shirvan lowland National: consumers from all across the country's territory
Grassland	High	As noted above, the Project area is widely used as a winter pasture, which increases the importance of	Local: local communities, farmers, ecosystems

		the ecosystem services offered by the area. At the same time, the importance of the service is medium, given that the service is provided by larger ecosystems, including the Project area.	Regional: farmers from the neighboring and remote districts of the southeastern Greater Caucasus mountains and Shirvan lowland
Biodiversity	High	Eastern Gobustan is among the most important development areas of semidesert and desert ecosystems. There are also several important bird areas in the region. Therefore, importance of the service was assessed as high.	Local: local communities, farmers, ecosystems Regional: ecosystems, researchers, tourists
Mineral resources	High	The zone has got a plenty of important geosites, some of which possess valuable mineral resources. Importance of the service was characterized as high	Local: communities Regional and national: researchers and mineral exploration companies
Construction materials	High	There are several construction material deposits in within the zone's zone, both operational and not explored.	Local: communities Regional and national: researchers and construction companies
Regulatory services			
Air quality	High	The zone provides some essential air quality-related ecosystem services, primarily due to the altitudes and wide untouched nature areas. Importance of the service was characterized as high.	Ecosystems, local communities
Regulatory potential of soils	Moderate	Taking into account that the project will be implemented on a low-fertility and vulnerable soil cover,	Local: local communities, land users, ecosystems

		importance of the service was characterized as moderate.	
Carbon storage	Moderate	Certain rock formations in the region, mostly limestone, sequester carbon dioxide from the atmosphere, helping to mitigate climate change.	Local: ecosystems
Erosion control	High	Rocky and hilly landscapes of the zone help prevent erosion, protecting soil and downstream water quality	Local: communities Regional: land and water users
Cultural services			
Tourism and recreation capacity	High	The presence of several mud volcanoes with the status of a specially protected natural monument in and around the project area, as well as a reserve (the UNESCO World Heritage Site) highlights the importance of this ecosystem service.	Local: local communities Regional: tourists from the neighboring districts National and international: tourists from the other parts of the country and abroad
Spiritual and religious value	High	In the Eastern Gobustan, there are several famous sacred places and abandoned old cemeteries. Additionally, there are cemeteries and places of worship in the AoI communities. Local traditions make this service of a high priority.	Local: Local communities Regional: people from Greater Baku, Absheron and Hajigabul districts
Aesthetic value	High	The natural beauty of geosites of the Eastern Gobustan inspire artists, photographers and writers, contributing to cultural expression.	Local: local communities Regional: communities of Greater Baku and other neighboring districts National and international: people from the other parts of the country and abroad

Scientific and Educational Value	High	Mud volcanos and other geological phenomena of the Eastern Gobustan are of a very high value for national and international scientific community	National: researchers from Baku and other parts of Azerbaijan International: foreign researchers

7. SOCIOECONOMIC BASELINE

7.1. Introduction

This Chapter provides summary of the Socioeconomic Baseline implemented as part of the Project ESBS. Primary goal of the Assessment is to create basis for evaluating possible impacts of the planned project upon the Project area's social environment, and to make such evaluation easier.

7.2. Study Programme and Methodology

7.2.1. Study Programme

Socioeconomic baseline assessment addresses social and economic situation, welfare and living standards of local population of the Project AoI. Also, it includes study of the cultural heritage and traffic intensity. Scope of the implemented SBS is described in Table 1.1.

The socio-economic baseline assessment is not required by national legislation. However, as the project is being prepared and implemented under the World Bank ESF/ESS, the World Bank ESF/ESS shall prevail in case of any inconsistency.

7.2.2. Study Program and Methodology

Project SBS was implemented using the following methodology:

- Acquisition of secondary data available on the district-level socioeconomic baseline of the Project AoI.
- Acquisition of primary data on the socioeconomic baseline of the Project affected settlements through interviews with local authorities
- Implementation of 1-day traffic intensity monitoring activities on the main Project affected roads
- Study of cultural and historical heritage through interviews
- Systematization and analysis of data collected through first activities 1-4.

In order to assess the Project area's socioeconomic baseline, a wide spectrum of information was collected from the following levels of sources:

- National and district levels – published statistical data, reports of central and regional government authorities, international organizations, etc.
- Local level – primary data acquired from EA representatives and municipalities.
- Baseline-related information that was used during this study was acquired from a number of primary and secondary sources described in the following subsections.

A. Secondary sources

Secondary sources of information include published and online materials analysed as part of the desktop studies. Information materials (both printed and online) produced by the following organizations were used during the Assessment:

- Yearbooks of the State Statistical Committee, including those dedicated to the socioeconomic environment, economic development indicators and infrastructure of Azerbaijan and Project affected districts
- Reports developed by various central government authorities and their regional branches
- Reports of the international organizations (e.g. UNDP, IFC, World Bank, etc.)

Data acquired from the cited secondary sources mainly addresses the demographic, socioeconomic and infrastructure related parameters of Azerbaijan as a whole, as well as the Project affected administrative districts as part of the country's administrative breakdown.

B. Primary sources

Primary sources of information include district and local level stakeholders, including EAs, municipalities, NGOs, entrepreneurs and local community representatives. Information from primary sources has been acquired through interviews with EA representatives[33] and municipality members, focus group discussions both with men and women in the affected communities crossed by the project, field visits to affected communities to collect information on sensitive receptors, and using the results/community feedback from public consultations on ESF documents. The list of the interviewed local authorities is provided in Table 7.1 below.

Table 7.1. Stakeholders interviewed to obtain data on the Project area's socioeconomic baseline

Name	Position	Meeting date	Discussion topic
Hajigabul district			
Shahmar Ismayilov	EA representative in Navahi	July 26, 2024	Information about socioeconomic conditions of the town/village
Huseynov İskandar	Deputy EA representative in Ranjbar	July 23, 2024	
Rizvan	EA representative in Gizilburun	July 24, 2024	
Zamig	EA representative in Pirsaat	July 23, 2024	
Perviz	EA representative in Atbulag	July 24, 2024	
Aghsu district			
Seyidov Babaseyid	EA representative in Langabiz	July 23, 2024	
Qanbarov Shahbaba	EA representative in Gashad	July 23, 2024	
Mammadov Sirac	EA representative in Garagoyunlu	July 23, 2024	
Maharramov Adil	EA representative in Dashdamirbayli	July 23, 2024	
Xalilli Fariz	EA representative in Gagali	July 23, 2024	
Mikayılova Sudaba	EA representative in Bijo	July 23, 2024	

33 Official name of the position standing for a local official representing district EA in the respective settlement.

Name	Position	Meeting date	Discussion topic
Shamakhi district			
Xalilov Ixtiyar	EA representative in Chol Goylar	July 24, 2024	
Mammadov Vuqar	EA representative in Ovchulu	July 23, 2024	
Ismayilli district			
Bashirov Tariyel	EA representative in Gubakhalilli	July 25, 2024	
Goychay district			
Nabiyev Nabi	EA representative in Garabaggal	July 23, 2024	
Shamilov Faqan	EA representative in Garamaryam	July 23, 2024	
Aghdash district			
Mahmudova Amanat	EA representative in Goshagovag	July 23, 2024	
Panakh Akhmadov	EA representative in Hushun	July 24, 2024	
Yevlakh district			
Cafarov Royal	EA representative in Arash	July 23, 2024	
Musayeva Parvana	EA representative in Akhsham	July 23, 2024	
Allahverdiyev Sahil	EA representative in Gulovsha	July 23, 2024	
Musayeva Parvana	EA representative in Havarly	July 23, 2024	
Xalilov Turabin	EA representative in Salahly	July 23, 2024	
Mammadov Asam	EA representative in Huruushaghi	July 23, 2024	
Huseynov Ali	EA representative in Tanrigulular	July 23, 2024	
Mammadov Asam	EA representative in Boshchali	July 23, 2024	
Hasanov Latif	EA representative in Yukhary Bujag	July 23, 2024	
Mingachevir			
Aliyev Ramiz	Mingachevir Municipality	July 24, 2024	

Furthermore, focus group discussions both with men and women in the affected communities crossed by the project, field visits to affected communities to collect information on sensitive receptors, and using the results/community feedback from focus group discussions and public consultations on ESF documents. Minutes of the discussions are provided in the public consultations section of the Report. Below is the table reflecting gender segregation of participants from the Project affected communities and summary of issues covered during consultations.

Table 7.2. Participants of Public Consultations and Focus group discussions

Region	Cluster of villages attended	Number of participants	Date	Discussion topic
Hajigabul	Navahi, Ranjbar, Gızılburun, Pirsaat, Atbulaq.	24 (8 women, 16 men)	September 30, 2024	-E&S risks and impacts and their mitigations plans -Project design (OHL
Shamakhi	Chol Goyler	15 (6 female, 9 male)	September 30, 2024	
Shamakhi	Ovchulu	30 (14 women, 16 men)	September 30, 2024	
Aghsu	Lengebiz, Bijo, Gashad.	28 (9 women, 19 men)	October 1, 2024	
Aghsu	Gegeli, Dashdemirbeyli	43 (4 women, 39 men)	October 1, 2024	
Aghsu	Garaqoyunlu, Ulguc	29 (15 women, 14 men)	October 1, 2024	
Ismayilli, Goychay	Gubakhelilli, Garameryem, Garabaqqal.	38 (7 women, 31 men)	October 1, 2024	
Goychay	Arabjabirli 1, Arabjabirli 2, Mirzahuseynli	23 (4 women, 19 men)	October 1, 2024	

Mingachevir	Mingachevir	41 (13 women, 28 men)	October 2, 2024	routes and rights-of-way, construction schedule, use of access roads) - Employment opportunities
Yevlakh	Tanrıqulular, Huruushaghi, Boshchaly.	35 (5 women, 30 men)	October 2, 2024	
Yevlakh	Havarli, Hacıselli, Salahly.	20 (5 women, 15 men)	October 2, 2024	
Agdash	Hushun, Yuxari Aghjayazi, Goshaqovaq, Arabojaghi.	26 (5 women, 21 men)	October 2, 2024	
Yevlakh	Arash, Akhsham, Gulovsha.	21 men	October 2, 2024	

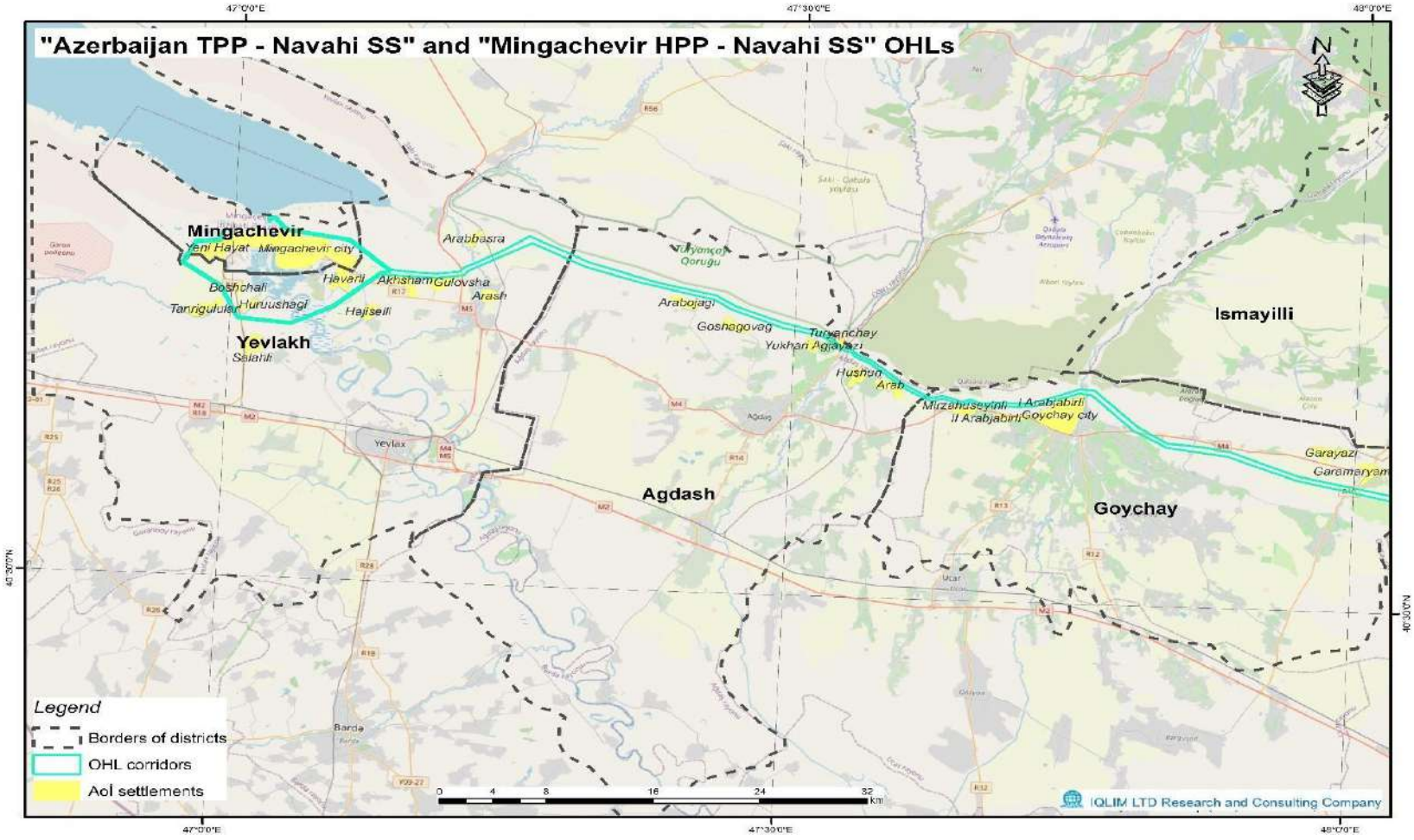


Figure 7.1: Geographic scope of socioeconomic baseline studies (sheet 1)

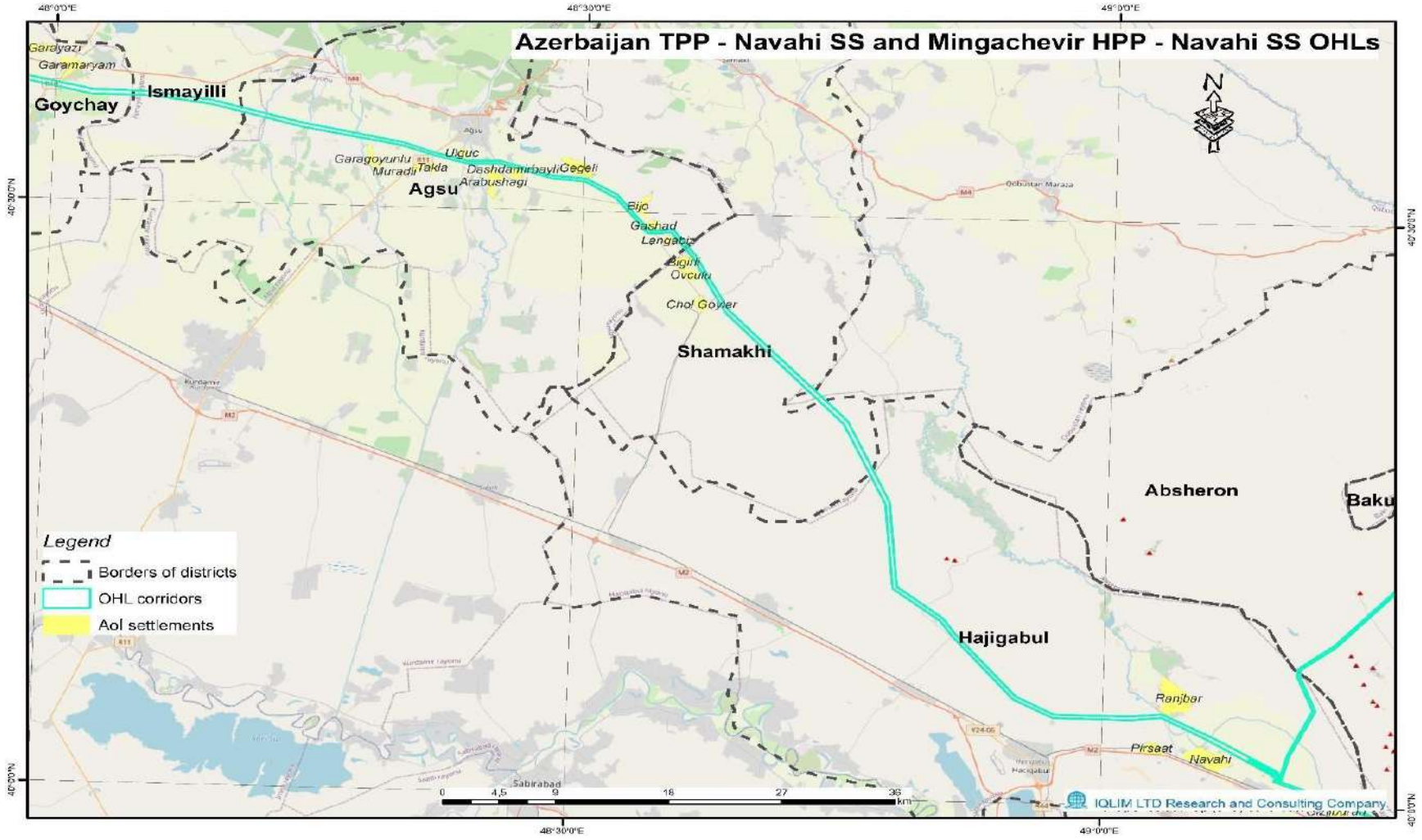


Figure 7.2: Geographic scope of socioeconomic baseline studies (sheet 2)

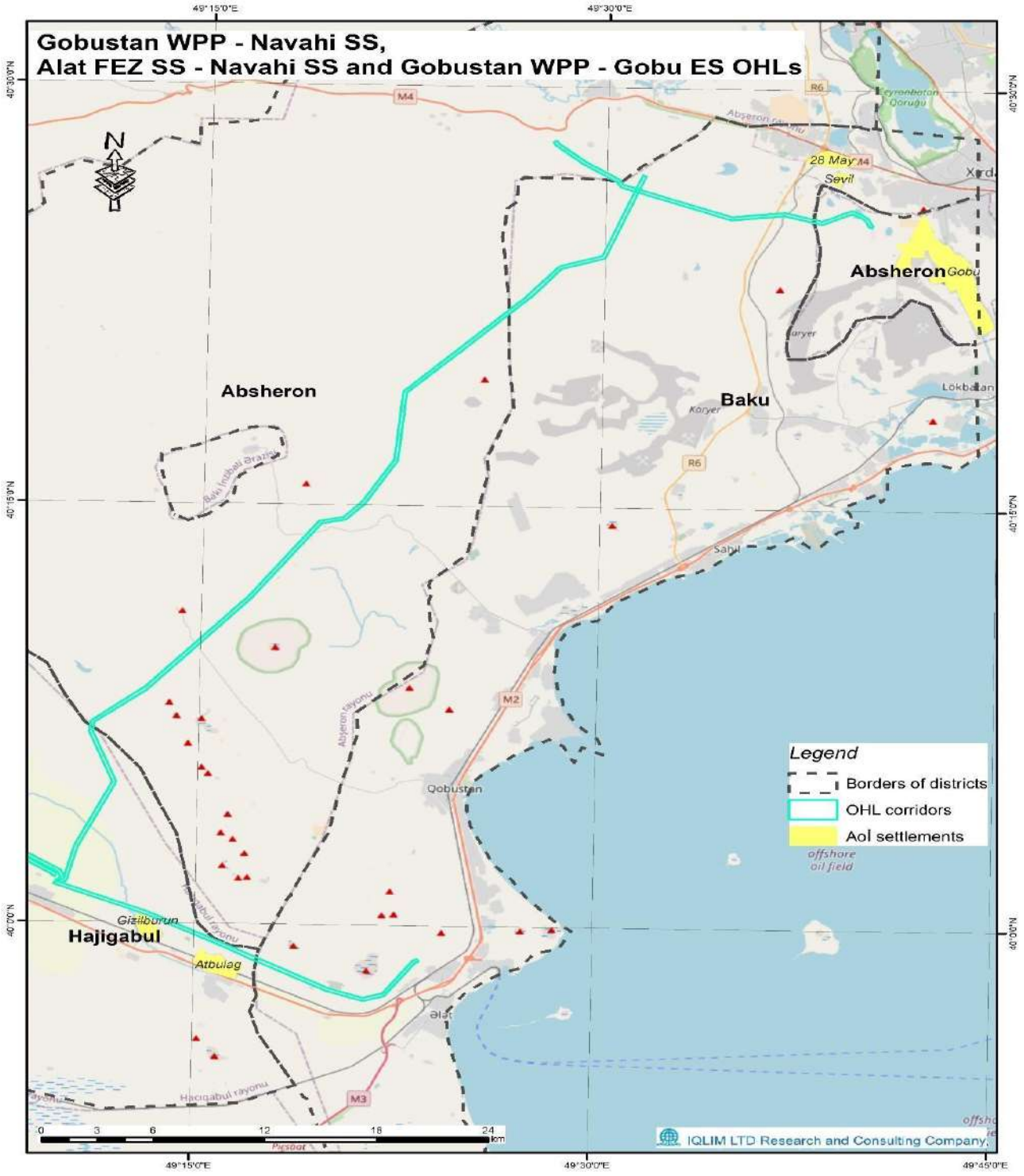


Figure 7.3: Geographic scope of socioeconomic baseline studies (sheet 3)

7.3. National Baseline

7.3.1. Demography

Total area of the territory of Azerbaijan is 86.600 km2, divided into 63 administrative districts. There are 78 cities, 14 urban districts, 261 settlements, 1724 rural territorial units and 4246 rural settlements in the country. Total number of the country's population is 10119.1 thsd persons, including 53% of the urban and 47% of the rural population. Crude rate of the country population's natural increase is 5.1%, and the urbanization rate is 1.64%34.

Dynamics of the country's demographic indicators are provided in Table 7.2 below.

Table 7.2. Demographic indicators of Azerbaijan.

Indicator	Years					
	1990	1995	2000	2005	2010	2023
Population (thsd persons)	7,131.9	7,643.5	8,032.8	8,447.3	8,997.4	10127.1
Males (%)	48.8	49.1	48.8	48.9	49.1	49.8
Females (%)	51.2	50.9	51.2	51.1	50.9	50.2
Urban (%)	3,847.3	4,005.6	4,116.4	4,477.6	4,866.6	54.6
Village (%)	3,284.6	3,637.9	3,916.4	3,969.7	4,130.8	45.4

According to the results of the population census conducted in 2019, 94.8% of the population of Azerbaijan are Azerbaijanis, 1.7% Lezgis, 0.9% Talyshs, 0.7% Russians, 0.5% Avars, and 1.4% other nationalities (Armenians, Udins, Tats, Jews, etc.). 93% of the county population are Muslims. Azerbaijan is a secular state. As of 2023, 5303.9 thsd people of the country's population are at the working age, of which 4988.2 thsd people are actually employed. Total number of unemployed people is 315.7 thsd people, and the unemployment rate is 7.1%.

7.3.2. Economy

Having regained its' national independence in 1991, Azerbaijan Republic started benefiting from its' sovereign rights to an independent economic policy. Cornerstone targets of this policy consisted in the development of multi-sectoral economic system, transition to a market economy and integration into the international economic system. 28 years of the country's economic development can be divided into the

34 "Azərbaycanın Statistik Göstəriciləri, 2021". Azərbaycan Respublikasının Dövlət Statistika Komitəsi, Bakı - 2022

following 2 major phases: 1) Economic stagnation and crisis of 1991-1995, and 2) starting from 1996, period of macroeconomic stability and economic development. Post-crisis development of the national economy mainly relied on the exploitation of the country's rich hydrocarbon resources. Thanks to a recovery and growth of the national oil-gas production industry, in 2001 the national GDP of Azerbaijan returned to a level of baseline 1991.

In 2005-2015, Azerbaijan became one of the world's most rapidly growing economies. This period was marked by a considerable growth of the country's economy, improvement of the population's welfare and modernization of the country's infrastructure. Results of the described 10-year period include 10.6% of growth in the country's real economy, 7.6 times increase of the GDP's nominal volume and 6.5 time rise in its' value per capita. If in 2005, Azerbaijan used to occupy 134th position in the world according to its' economic strength, in 2015 the country managed to advance to the 79th position. Poverty level was reduced from 40.2% in 2005 till 4.9% in 2015. According to WB classification (Atlas methodology), Azerbaijan belonged to the categories of poor countries until 2004, countries with average income in 2005-2008, and above-average income since 2009. According to the Statistical Committee's information, growth rate of the national economy had averaged at 16.9% in 2004-2010, and at 2.7% in 2011-2014. At the same time, total investments made into the country's economy grew by 17.9% in 2004-2010, and 11.9% in 2011-201435.

Since the second half of 2014, considerable decline of the prices of major energy carriers had caused a reduction of the country's incomes in convertible currencies. This factor had seriously hamstringed the financing of previously practiced model of the economic growth. Resultantly in 2014-2016, value of the country's annual GDP reduced by 70% if calculated in US dollars, while for the same period the national poverty rate increased by 1% and constituted 5.9%.

Considerable reduction of the oil-generated incomes had made it necessary to develop a new model of economic development. Because of urgent reforms implemented, the country's major economic indicators resumed its' gradual growth since 2017. Dynamics of the country's major socioeconomic indicators are provided in Table 7.3 below.

35 Strategical Roadmap for National Economic Perspectives of Azerbaijan Republic. 2016

Table 7.3. Main socioeconomic indicators of Azerbaijan.

Indicator	Years						
	2005	2010	2014	2015	2016	2017	2022
GDP (billion $)	13.2	52.9	75.2	53.0	37.2	41.8	78.7
GDP per capita ($)	1579,8	5922,0	8055	5561,5	3926,5	4238,0	7818.9
Inflation rate (%)	9.68	5.666	1.351	4.049	10.247	13	13.9
Average monthly wage ($)	130.7	413.0	566.7	466.9	313,2	308.8	432.3
Unemployment level (%)	7.625	6.048	6.048	6.048	6.048	6.048	5.76
Poverty level	29.3	9.1	4.9	4.9	5.9	5.4	5.9

7.3.3. Road Infrastructure

A. Automobile roads

According to 2021 statistical information, total length of the country's exploited automobile roads equalled 19,016 km, of which 4,659 km were of the Republic's, and 14,357 km of the local importance. 18,895 km of the roads are with hard pavement, including 125 km paved with cement-concrete, 9,716 km with asphalt, 7079 km with gravel, and 1975 km with the other types of hard pavement. Total length of the country's existing earth roads is 121 km. There are 1494 bridges in Azerbaijan, the total length of which equals 52,674 rm. 637 bridges (29,811 rm) are of the Republic's, and 857 bridges (22,863 rm) are of the local importance[36].

Although the country's automobile roads were negatively impacted by the economic crisis of 1990's, since the second half of 2000's certain reforms have been undertaken to improve the quality of national road infrastructure. According to 2017-2018 World Competitiveness Report, Azerbaijan occupied 36th position among the world's countries according to a quality of the road infrastructure.

B. Railroads

36 "Azərbaycanda Nəqliyyat". Azərbaycan Respublikasının Dövlət Statistika Komitəsi, Bakı - 2017

Azerbaijan Railways play the major role in the transport network of the Caucasus. There is a significant strategic meaning of this railway line connecting the country with Georgia, Turkey, Russia and Iran. Total operational length of the Azerbaijan Railways is 3261 km, 1250 km of it is electrified and comprises 60% of the total length. 459 km of the electrified railways is the single-way, 791 km –is two-way line[37]. Since 2010, state programs have been initiated in order to modernize the railroad system of Azerbaijan.

7.3.4. Energy

A. Electricity

Ensuring energy security is the cornerstone element of the economic security of Azerbaijan. Reforms in the power supply sector enabled 100% coverage of the domestic electricity demand and increase of the country's respective export potential. Today, the established capacity of the national power generation system reaches 7172,6 megawatts. The system's maximum capacity is 5200 MWt, while the domestically required maximum peak capacity averages at 3750-3900 MWt.

Table 7.4. Electrical power balance of Azerbaijan (million KWt/h).

	Years					
	2010	2013	2014	2015	2016	2021
Generated	18709,5	23354,4	24727,7	24688,4	24952,9	25 839,1
Imported	99,8	127,3	124,1	107,5	114,4	136.5
Exported	462,4	495,6	489,3	265,0	1095,5	1 150,7
Losses	3830,1	3280,6	3362,5	2868,6	2350,2	2250,6

B. Gas

In 2017, active capacity of the country's underground gas reservoirs was increased to 1.9 bln m3 in order to cover the domestic demand and to increase the country's export potential. Additionally, new pressure-gas wells were constructed and the old ones were repaired. In 2020, the total of 26487 mln m3 of natural gas have been produced at the territory of Azerbaijan.

In 2017, about 1336.4 km of new gas pipelines were built and 204.4 km of the old ones were refurbished to improve the national gas supply system and to increase its' physical capacities. During the reported

37 EIA Report of the Project "New Locomotive Maintenance Workshops of Baladjari and Gandja". "INGEROP GROUP" Company. Baku - 2017

year, 80458 new consumers have been connected to the network, of which 38122 consumers were the residents of Azerbaijan regions. As of 2020, number of consumers supplied with a natural gas reached 2,247 thsd persons.

Table 7.5. Natural gas balance of Azerbaijan (million m^3).

	İllər					
	2010	2013	2014	2015	2016	2020
Produced	16672,7	17895,1	18826,5	19236,1	18717,6	26 487,3
Imported	-	-	-	-	298,4	-
Exported	6187,2	7308,0	8093,2	8145,2	8049,1	13 839,9
Losses	1117,0	891,0	942,0	1087,0	804,8	769,0

7.3.5. Water Supply and Sanitation

Rational use of the country's limited water resources is one of the national economy's Number 1 priorities. Currently, all freshwater sources of Azerbaijan are currently used to supply water to the population. Freshwater demands of the people in regions are mainly covered through nearest surface and groundwater resources, including middle and lower reaches of Kur flowing to the east of Mingechevir reservoir.

Over the past 20 years, major projects have been implemented in the water supply and sanitation sector of Azerbaijan, the purpose of which was to provide the population with quality drinking water without interruption and to improve sanitation services. During this period, the number of people provided with drinking water in a centralized manner across the country has increased more than three times compared to 2004. Thus, as of October 1, 2023, 1813531 users of drinking and wastewater services were registered across the country. 1,741,155 or 96 percent of them are population, and 72,376 or 4 percent are commercial users.

The increase in the number of users is due to the implementation of new projects, the connection of consumers to centralized drinking and wastewater networks, the registration of newly built private residential houses as subscribers by receiving technical conditions, the registration of new subscribers from Housing Construction Cooperatives, as well as cases of illegal use of drinking water and sewage services. was discovered and registered.

7.3.6. Education

General secondary school education in the Republic of Azerbaijan consists of three levels (primary, general secondary and full secondary). General high school education is carried out on the basis of relevant educational programs (curricula). General high school education in the country is carried out mainly in comprehensive schools, special educational institutions, gymnasiums, high schools, primary and secondary vocational schools, as well as in schools established under colleges and higher education institutions.

A. Pre-school education

For the duration of last 10 years, the number of pre-school education centers haven't changed in Azerbaijan. However, there was a notable change in the share of private kindergartens. If in 2006, only 3 of the country's 1764 pre-school education facilities were private, in 2018 their share increased to 105 of 1785. At the same time, it must be noted that this regularity is only the case with large cities, and 100% of children from rural areas only can benefit from the state-run pre-school education facilities. 719 the country's active kindergartens are in villages.

B. General education

There are 4433 general education facilities in Azerbaijan (28 private), including 315 primary schools. 789 general secondary schools, 3313 complete secondary schools and 16 schools for the children with limited health. The total number of children enrolled in the above institutions equalled 1616.1 thsd people, of which 5.7 thsd studied in at primary schools, 73.6 thsd at general secondary schools, 1730.1 thsd at complete secondary schools, and 6.6 thsd at schools for the children with limited health. The total number of teachers engaged with general education institutions equalled 151.9 thsd persons. In Azerbaijan there are also 7 distance education institutions, in which 1964 pupil were studying.

C. Primary Vocational, Secondary Specialized and Higher Education

In the 2022-2023 academic year, there were 99 first vocational-specialized educational institutions operating in Azerbaijan, and the number of students in them was equal to 22,749 people. In 2022, the number of teachers working in the first vocational-specialized educational institutions was 1457 people.

In the same year, there were 59 secondary specialized educational institutions in Azerbaijan, the total number of students studying there was equal to 63 thousand people. The number of teaching staff working in the said educational institutions is equal to 6045 people.

In 2022-2023, there were 51 state and non-state higher education institutions in the territory of the Republic, of which 40 were state and 11 were non-state institutions. The total number of students studying in higher educational institutions of the country is 212.1 thousand people, of which 175.4 thousand people were studying full-time, and 16.7 thousand people were studying part-time.

7.3.7. Healthcare

After being negatively affected by the economic and political crisis of 1990's, national health system of Azerbaijan had started to recover since 2003. Due to increased budgetary funding (in 2013, 11 times more state funds have been allocated for health than in 2003), the government managed to open and renovate nearly 500 healthcare facilities, and to improve the level of drug supply to the treated patients, increasing the amount of used most important medicines from 60 to 166.

According to the statistical data of 2023, there are 342 state-run and private hospitals in Azerbaijan. The total number of hospital beds is 39.1 thsd, 4.3 thsd of which are for the underage patients. Today, there is an average of 38.9 beds for every 10000 of the country's population.

As of 2022, there were 1663 operational outpatient departments in Azerbaijan, including 106 antenatal clinics and 230 children's polyclinics and outpatient departments. In the same year, there were the total of 3.4 thsd beds designed for the pregnant and childbirth women. In Azerbaijan, there are 79 emergency (first aid) stations.

Currently, there are 31.0 thsd doctors (31.8 doctors for every 10000 of the country's population) and 53.3 thsd paramedical staff (53.1 paramedical staff for every 10000 of the country's population) employed in the country's healthcare facilities.

7.4. District Level Baseline

This section presents statistical information on the socioeconomic baseline of the Project affected administrative districts of Azerbaijan. As seen from the project description, the Project AoI covers a relatively narrow strip of lands running across the territories of 10 districts. Situation map of the districts against the Project AoI is provided in Fig. 7.4 below.

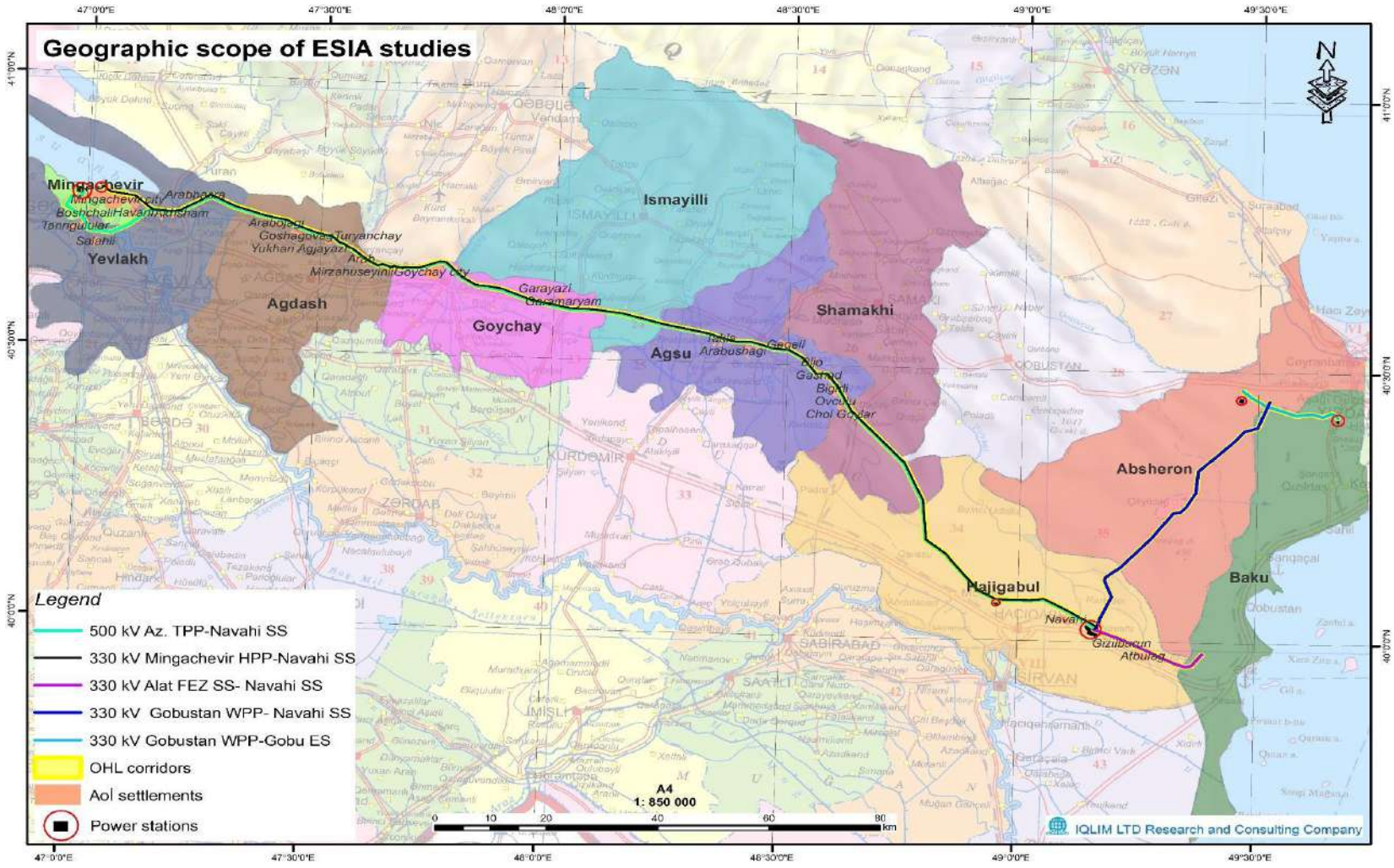


Figure 7.4. Situation map of the districts against the Project AoI

7.4.1. Hajigabul

General information[38]

Hajigabul district is one of the 66 districts of Azerbaijan. It is located in the east of the country, in the Shirvan-
Salyan Economic Region. The district borders the districts of Kurdamir, Aghsu, Shamakhi, Gobustan, Absheron, Baku, Salyan, Sabirabad and the city of Shirvan. Its capital and largest city is Hajigabul.

Hajigabul district was established in 1990. Its territory is 1.60 thousand sq. km and it is 1.9 percent of the republic's territory. Hajigabul district mainly is located in the Shirvan plain and it is below sea level.

There are 31 populated areas. One of them is a city, 1 city-like settlement, 4 settlements and 25 villages. There are 15 administrative-territorial units, 5 medical institutions and 55 cultural centres. The Pirsaat River and Pirsaat valley is located in this region.

Demography

According to the statistical data of 2022, there are 75.3 thsd people living at the Hajigabul district's territory. With an average population density of 47 persons/km2, 49.29% of the district's population are living in towns and urban-type settlements, while 50.71% reside in the rural areas. 48.62% of the urban and 51.38% of the rural population are males. Population of Hajiqabul town is 26876 people.

According to 2019 population census, there are 72948 Azerbaijanis, 116 Talish, 19 Russians, 1 Ukrainian, 210 Turkish, 1 Georgian and 29 representatives of the other nationalities living at the district's territory.

34.5% of the district's population are at the age of 0-19, whereas 58.6% belong to the age group of 20-65. According to 2022 statistics, Crude rate of the district's population increase was 7.3 persons / 1000 people.

Socioeconomic indicators

The Baku-Tbilisi railway line runs through the region, with a length of 58 km. Additionally, 82 km of the Great Silk Road passes through the region. These roads belong to categories I and II. The region lacks recreational and tourism areas, as well as sports complexes. However, more than 35 large state and private enterprises operate in the region. The largest of these enterprises is the Kur Water Supply and Operation Department, which began its activities in 1971 and has since expanded and developed during the period of independence. It supplies drinking water to nearby areas and the city of Baku and employs around 500 people.

The Main Gas Pipeline Production Department and the underground Kalmaz Gas Storage Station provide the republic with blue gas fuel, employing more than 300 staff members. The railway organization

38 https://en.wikipedia.org/wiki/Hajigabul_District

operates in the region, ensuring uninterrupted and high-quality rail transport across the republic. The "Adishirin" and "Pirsaat" poultry farms supply Hajiqabul and nearby areas with high-quality poultry meat and eggs. These enterprises employ over 400 workers and employees. The foundations of both farms were laid during the period of independence.

Municipalities have been operating in the region since 1999. There are 15 municipalities here.

In January-June 2020, the volume of product release in all areas of the economy was 133,497.0 thousand AZN. Agriculture (53.4 percent), trade and service (30.0 percent), and industry (9.9 percent) sectors accounted for the majority of output. The specific weights of product release in construction, communication, and transport were 5.5 percent, 0.3 percent, and 0.9 percent, respectively. In January-June 2020, the volume of production in the manufacturing sectors of the regional economy was 91830.5 thousand AZN, and in the service 41666.5 thousand AZN. The output shares in the construction, communications, and transport sectors amounted to 5.5 percent, 0.3 percent, and 0.9 percent, respectively.

According to 2022 statistics[39], there are 7922 economic transactors in Hajiqabul district, 683 of which have a status of legal entities. Number of hired employees 8000 persons. The district's average nominal wage of 600.9 AZN/month (353$).

As of 2022, the district's gross production output was 435180,5 mln AZN, of which 88933,6 thsd AZN were on the industry, 304236,4 thsd AZN on the trade, and 41694,9 thsd AZN on the capital investments. In 2022, 53 new job places have been opened in Hajiqabul. 2457 persons are registered as unemployed.

The main part of the district's economy is agriculture. It includes grain growing, cotton growing, vegetable growing, horticulture, and livestock breeding. As of 2020, totally, the yield of grain crops in the region was 29.6 c/ha, including 25.6 c of wheat and 33.6 c of barley.

Sown area of the agricultural crops equals 23645 ha, of which 20029 ha are used under cereals and dried pulses, 84 ha under potato, 414 ha under vegetables and 1610 ha under fruits and berries. As of the beginning of 2023 the total of 162320 tons of plants have been grown at the district's territory, including 92557 tons of cereals and dried pulses, 855 tons of potato, 6006 tons of vegetables, and 15046 tons of fruits and berries.

Cattle breeding is traditionally one of the district's major agricultural sectors. For 2022, there were 26981 heads of cattle, 113604 heads of sheep and goats, 2385777 heads of poultry and 1866 families of bees at the district's disposal. In 2022, the district's agricultural facilities produced 6304 tons of meat (in slaughtered weight), 27084 tons of milk, 288438 thsd units of egg and 200 tons of wool.

39 https://www.stat.gov.az/source/regions/

Education

By the beginning of 2023, there were 3 pre-school and 33 general education institutions at the district's territory. Number of children attending the pre-school education facility equaled 113 persons, while the number of children gong to general education facilities amounted to 12008 pupils. In order to increase the education and awareness level of the local population, there are 27 public libraries with a total fund of 147.3 thsd books, 4 parks, 27 libraries, 18 clubs and 2 museums.

Healthcare

According to a statistical data of 2023, there are 1 hospital and 12 polyclinics operating at the territory of Hajiqabul district. Local hospital offers the total 86 of hospital beds, which means 11.4 beds for every 10000 of the district's population. It must be emphasized that this indicator is by 71% lower than the Republic's average indicator (38.8). When it comes to the district's medical personnel, for the period of 2012-2022 the number of doctors reduced from 81 to 44, and the number of paramedical staff reduced from 264 to 177. As of 2022, there are 5.8 doctors and 23.5 paramedics for every 10000 of the local population, which is far below the Republic's respective average indicators[40].

Transport and Communications

For 2022, the total length of the roads in Hajiqabul district equals 212 km, including 85 km of 1st, 9 km of 2tnd and 109 km of 5th Category. According to a statistical data of 2022[41], there are 8248 vehicles registered in the district, including 1198 trucks, 112 buses and 6787 private vehicles.

17 automatic telephone stations with a capacity of 7,600 numbers are operating in the district to develop the telephone service of the population.

7.4.2. Shamakhi

General information[42]

Shamakhi district It is located in the east of the country and belongs to the Mountainous Shirvan Economic Region. The district borders the districts of Guba, Khizi, Gobustan, Hajigabul, Aghsu, and Ismayilli. The district is located on the southern and southeastern slopes of the Greater Caucasus. In the north of the district is the watershed of the Main Caucasian Range, in the west is the Akhsu Pass, in the southwest is the Langyabiz Range, in the south is the Shirvan Plain, in the southeast is the Gobustan nomad camp. From the east along the border of the district flows the Pirsaat River.

40 https://www.stat.gov.az/source/healthcare/?lang=en
41 https://www.stat.gov.az/source/communication/
42 https://ru.wikipedia.org/wiki/

The area of the district is 154691 hectares. The total area of suitable land is 112500 hectares. 12300 hectares are forested. 80% of the district is located in the lowlands and plateaus. 20% is located at an altitude of 1500 meters above sea level. The highest point of the district is considered to be the peak of Gyulumdostu.

The climate of the region is moderately warm. The landscape is changeable. Steppes are replaced by foothill meadows, forests. The soil of the district is fertile, rich in flora and fauna. More than 50 species of medicinal plants grow on the territory of the district.

There are mud volcanoes in the area. On March 9, 2024, a mud volcano erupted in the village of Melikchobanli. Breccia emissions reached a height of 10-15 meters. Its capital and largest city is Shamakhi. The area of the district is 1670 km2. It is located in the southeastern foothills of the Greater Caucasus at an altitude of 800 meters above sea level, on the Baku - Tbilisi highway, 122 km west of Baku and 72 km northeast of the Kurdamir railway station.

Shamakhi city, the administrative center of the Shamakhi district. Shamakhi as a city of Caucasian Albania is mentioned by Ptolemy (2nd century) under the name Kemakheya or Mamakheya.

Demography[43]

According to the statistical data of 2023, there are 104848 people living at the Shamakhi district's territory. With an average population density of 63 persons/km2, 49120 (46.85%) of the district's population are living in towns and urban-type settlements, while 55728 (53.15%) reside in the rural areas. 46.63% of the urban and 53.37% of the rural population are males. Population of Shamakhi town is 39574 people.

According to 2019 population census, there are 99.15% Azerbaijanis. Other ethnic groups such as the Lezghins, the Russian, the Tats, the Tsakhur make up the other 0.85% of the Shamakhi district population.

36984 people (35.28%) of the district's population are at the age of 0-19, whereas 59586 people (56.83%) belong to the age group of 20-64. According to 2023 statistics, Crude rate of the district's population increase was 9.3 persons / 1000 people.

Socioeconomic indicators[44]

The district belongs to the Mountainous Shirvan economic region. According to 2023 statistics, there are 12366 economic transactors in Shamakhi district, 709 of which have a status of legal entities. Number of the people employed by the district's economic facilities is 9.0 thsd persons. The district's average nominal wage of 562.8 AZN/month (331$).

43 https://www.stat.gov.az/source/demoqraphy/

44 https://www.stat.gov.az/source/system_nat_accounts/?lang=en , https://en.wikipedia.org/wiki/Shamakhi

As of 2022, the district's gross production output was 335486,6 mln AZN, of which 15986,2 thsd AZN were on the industry, 316176 thsd AZN on the trade, and 123152,2 thsd AZN on the capital investments. In 2022, 113 new job places have been opened in Shamakhi. 2497 persons are registered as unemployed.

There are 19 industrial enterprises in operation.

Shamakhi district is the largest centre of Azerbaijani viticulture. Famous carpets are woven in mountain villages. Thus, at Shamakhi carpet shop where were installed 40 pieces of machine tools, which belongs to "Star" LTD, weave carpets such as "Guba-Shirvan", "Nakhchivan", "Garabagh" and "Tabriz". In 2005, at the Shamakhi TV Production Plant built by "Star" LTD, "Star" branded 37, 54, 72, 74 "LCD", "Plasma", "CV" and digital "Receivers" are produced based on spare parts of Toshiba "VCD". "Star" LTD has invested $10 million in the construction of the AzSamand car production plant.

The area of land suitable for agriculture is 29897 hectares. As of 2022, 20149 hectares are sown with grain and grain-legumes, including 12170 hectares with summer and winter wheat. 267 hectares are sown with sugar beets, 339 hectares with potatoes, 180 hectares with vegetables, 15 hectares with melons, 2070 hectares with vinegars, 880 hectares with orchards.

In 2022, the district produced 38095 tons of grain and legumes, including 21905 tons of wheat, 20349 tons of sugar beets, 2334 tons of potatoes, 1333 tons of vegetables, 43 tons of melons, 13500 tons grapes, 2017 tons of fruits and berries.

Agroparks have been created in the district. Beekeeping is developed. In 2021, the number of bees in beekeeping was 14606.

The area of pastures is 40226 hectares. In 2022, 7965 m2 of housing was delivered in the area.

In 2022, the farms contained 45181 heads of cattle, 111811 heads of sheep and goats, and 228710 heads of poultry. In 2022, the district's agricultural facilities produced 2327 tons of meat (in slaughtered weight), 44013 tons of milk, 23174 thsd units of egg and 277 tons of wool.

In recent years, this region has become a popular holiday destination for tourists. Those who prefer hiking make excursions from here to the cities of Guba and Ismayilli. Ecotourists strive to visit the Dzhangi forest, where wild apple, pear, and cherry plum grow, and on its outskirts, near the gorge, sulphur springs flow.

Education[45]

As of the most recent statistical data of 2022, there are 21 pre-school and 69 general education institutions at the district's territory. Number of children attending the pre-school education facility equalled 974 persons, while the number of children gong to general education facilities amounted to 15052 pupils. In order to increase the education and awareness level of the local population, there are 39 public libraries

45 https://www.stat.gov.az/source/education/

with a total fund of 379.0 thsd books, 27 cultural centres and 4 museums. According to 2019 population census, of those who are at the age of above 7065 persons have had higher (3116 women), 6797 have secondary specialized (3600 women), 40902 have complete secondary (20228 women), 9631 have general secondary (5411 women) and 4268 have primary (2505 women) education. 251 persons (193 women) have had no education at all.

Healthcare[46]

According to a statistical data of 2022, there are 2 hospitals and 17 polyclinics operating at the territory of district. Local hospitals offer the total 154 of hospital beds, which means 14.7 beds for every 10000 of the district's population. When it comes to the district's medical personnel, for the period of 2015-2022 the number of doctors reduced from 152 to 116, and the number of paramedical staff reduced from 359 to 299. As of 2022, there are 11.1 doctors and 28.5 paramedics for every 10000 of the local population.

Transport and Communications[47]

As of the beginning of 2023, total length of the roads in district equals 355 km, including 15 km of 1st, 23 km of 2nd, 86 km of 3rd, 189 km of 4th, and 42 km of 5th Category roads. The total of 733 thsd tons of cargo and 10761 thsd passengers have been transported by the district's road infrastructure in 2022. There are 12487 vehicles registered in the district, including 1344 trucks, 141 buses and 10866 private vehicles.

As of the beginning of 2023, the district had 15 operating post offices. Per every 100 people, there were 56 fixed telephone lines (59 in the urban and 54 in the rural areas).

7.4.3. Aghsu

General information[48]

Aghsu district is located in the east of the country, in the Mountainous Shirvan Economic Region. The district borders the districts of Ismayilli, Shamakhi, Kurdamir, and Hajigabul. There are 1 town (Aghsu city) and 79 villages in the district. Its capital and largest city is Aghsu. The area of the district is 1.020 km2.

On October 8, 1943, Aghsu began functioning as a separate administrative-territorial district. 1963 Aghsu was abolished and transferred to the Kurdamir region, and in 1965 it again became an independent region. Until 1967, Aghsu was an urban-type settlement, in the same year it received city status.

Aghsu District is located south of the Great Caucasian Mountains and on the plain of Shirvan. 6 villages, 3 territory units are mountainous. Relief of the district consists of mountainous, foothills and slanting flats. The mountainous zone is located at 700–1000m height above sea level. Relief of the mountainous zones

46 https://www.stat.gov.az/source/healthcare/?lang=en
47 https://www.stat.gov.az/source/transport/?lang=en
48 https://en.wikipedia.org/wiki/Aghsu_District

is compound with rivers, valleys, ravines. Langabiz mountain chain is formed by small grey mountains from the banks of Goycay River to Pirsaatchay River. Its highest peak Sendelen (it is also known as "Sangalan" and "Bijo mountain") situated in the territory of Bijo village has the 929 m height above sea level. The Girdimanchay and the Aghsuchay and their branches flow through the district. Kukash gorge and Javanshir Lake (in the west), Yukhari Shirvan canal and its branch Aghsu (in the south) as well as little Bijoderesi river are located in the district.

Demography[49]

According to the statistical data of 2023, there are 80.0 thsd people living at the Aghsu district's territory. With an average population density of 78 persons/km2, 22.1 thsd people (27.63%) of the district's population are living in towns and urban-type settlements, while 57.9 thsd people (72.37%) reside in the rural areas. 11.2 thsd people (27.8%) of the urban and 29.1 thsd people (72.2%) of the rural population are males. Population of Aghsu town is 22.7 thsd people.

According to 2023 population census, there are 99,0% Azerbaijanis, 1.1% - Lezgins, Turks, etc. living at the district's territory.

31.3% of the district's population are at the age of 0-19, whereas 61.0% belong to the age group of 20-65. According to 2022 statistics, Crude rate of the district's population increase was 8.7 persons / 1000 people.

Socioeconomic indicators[50]

Aghsu district is an agricultural region. An important place in its economy is occupied by livestock farming, grain growing, cotton growing, and fruit and vegetable growing. 76.0% or 77,854 hectares of its territory are suitable for agriculture, of which 46.6% or 36,247 hectares are cultivated lands.

According to 2022 statistics, there are 9949 economic transactors in Aghsu district, 504 of which have a status of legal entities. Number of the people employed by the district's economic facilities is 6900 persons. The district's average nominal wage of 562,9 AZN/month (311$). By this indicator, Aghsu occupies the second position the Mountainous Shirvan Economic Region.

As of 2022, the district's gross production output was 320979,0 mln AZN, of which 51733,0 thsd AZN were on the industry, 203444,0 thsd AZN on the trade, and 73526,9 thsd AZN on the capital investments. In 2022, 139 new job places have been opened in Aghsu. 1999 persons are registered as unemployed.

49 https://www.stat.gov.az/source/demoqraphy/
50 http://Aghsu-ih.gov.az/az/district-haqqinda.html ,
https://www.stat.gov.az/source/system_nat_accounts/?lang=en

Aghsu district is the agricultural district. Cattle-breeding, grain-growing, cotton-growing, fruit-growing and vegetable-growing are the most important fields of the district's economy. 75.2% or 76742 hectare of its territory is useful for agriculture, 46.3% or 35550 hectares of it consists of arable land.

The economy of the district is arranged by agricultural activity.

In 2022, the total output of the district was 320979 mln AZN, and 130705,2 thousand AZN or 40.7 per cent falls to agriculture's share. Vegetable products of 75637,9 thousand AZN, cattle-breeding products of 55067,3 thousand AZN were produced in the district.

Development of poultry in the district was considered in the State Program "Social-economic development of the regions of Azerbaijan Republic" (2004–2008 years). Inhabitants are busy with poultry in all zones. Three private incubation workshops seasonally operate in the district. The industrial method of poultry is under control. "Shaban-Poultry" LLC has operated in Musabeyli village since 2005. Birds for slaughter are breed in the establishment. 243482 birds were breed in the 2022 year.

Cattle-breeding dynamically develops in the district. Cattles are bred for dairy and slaughter. There were 57698 cattle, 135393 sheep and goats in the district, in 2022. In 2022, the district's agricultural facilities produced 3025 tons of meat (in slaughtered weight), 31120 tons of milk, 13697 thsd units of egg and 322 tons of wool.

Wheat, barley, alfalfa, maize, sunflower, watermelon and vegetable, sugar-beet, potato, grape, pomegranate and other plants are cultivated in the district. In 2022, 124184 tons grain (in 39964-hectare area), 1506 tons potato, 6071 tons vegetable, 2529 tons water-melon, 15728 tons fruit were cultivated in the district by private farmers and proprietors of individual plots.

Education[51]

As of the most recent statistical data of 2022, there are 8 pre-school and 68 general education institutions at the district's territory. Number of children attending the pre-school education facility equalled 397 persons, while the number of children gong to general education facilities amounted to 9953 pupils. In order to increase the education and awareness level of the local population, there are 32 public libraries with a total fund of 214.9 thsd books, 19 clubs and 2 museums. According to 2019 population census, of those who are at the age of above 5583 persons have had higher (2273 women), 4719 have secondary specialized (2309 women), 34376 have complete secondary (17232 women), 7890 have general secondary (4675 women) and 2547 have primary (1540 women) education. 281 persons (175 women) have had no education at all.

51 https://www.stat.gov.az/source/education/

Healthcare[52]

According to a statistical data of 2022, there are 1 hospital and 17 polyclinics operating at the territory of district. Local hospitals offer the total 160 of hospital beds, which means 20.0 beds for every 10000 of the district's population. When it comes to the district's medical personnel, for the period of 2015-2022 the number of doctors reduced from 76 to 67, and the number of paramedical staff reduced from 256 to 226. As of 2022, there are 8.4 doctors and 28,3 paramedics for every 10000 of the local population.

Transport and Communications[53]

As of the beginning of 2023, total length of the roads in district equals 306 km, including 38 km of 2nd, 38 km of 3rd, 215 km of 4th, and 15 km of 5th Category roads. The total of 297 thsd tons of cargo and 6884 thsd passengers have been transported by the district's road infrastructure in 2022. There are 9533 vehicles registered in the district, including 995 trucks, 108 buses and 8343 private vehicles.

As of the beginning of 2023, the district had 22 operating post offices. Per every 100 people, there were 26 fixed telephone lines (59 in the urban and 14 in the rural areas).

7.4.4. Ismayilli

General information

The Ismayilli District is situated in the northeastern part of the Republic of Azerbaijan, encompassing mountainous and foothill terrain. Its highest point, Mount Babadag, reaches an elevation of 3,629 meters above sea level. The district shares borders with the Quba District to the north, the Gabala District to the west, the Goychay and Aghsu Districts to the south, and the Shamakhi District to the east. The Ismayilli District covers an area of 2,074 square km and has a population of 63,400. Within its boundaries, there is one city (Ismayilli), two urban-type settlements (Lahij and Basqal), and 106 villages.

Demography

As of the beginning of 2023, the total population of the district was 86,700, with 21.8% residing in urban areas and 78.2% in rural areas. The population is composed of 50.5% females and 49.5% males. According to the 2009 census, 86.24% of the population identified as Azerbaijani, 10.03% as Lezgi, 1.76% as Russian, and the remainder as representatives of other nationalities. The age distribution of the population is as follows: 28.15% in the 0-19 age group, 63.15% in the 20-65 age group, and the rest in the 65-99 age group. In 2022, the annual natural population growth rate per 1,000 people in the district was 8.

Regarding the demographic indicators of the project area, it is important to note that the village of Qubakhaliilli, which will be most directly affected by the project, has a total area of 9,570 hectares, with a

52 https://www.stat.gov.az/source/healthcare/?lang=en
53 https://www.stat.gov.az/source/transport/?lang=en

registered population of 2,349 and a current population of 1,749. There are 561 households and 448 houses in the village. The village population consists of 1,019 males and 1,064 females. These statistics also include the village of Chermedil, which is within the administrative jurisdiction of Qubakhaliilli.

Another settlement within the project's area of influence is the village of Kurdmashy, which has a population of approximately 4,000 people living in 905 households. As of March 16, 2016, there were 712 individual residential houses in the village. The population is 3,213, with 1,603 males and 1,610 females.

Socioeconomic Indicators

The main economic activities in the district are agriculture and tourism. The agricultural sector includes grain cultivation, animal husbandry, viticulture, fruit growing, tobacco cultivation, and others. The district also has industrial enterprises such as a bicycle factory, carpet factory, wine and juice factories, meat and dairy processing plants, and others. There are numerous private enterprises operating in the district, including 19 agricultural enterprises, 36 large tourism facilities, and 22 industrial enterprises.

According to statistical data from 2023, there were 6,779 business entities operating in the district, of which 696 were legal entities. The number of employed people in the district's economy was 9,000, with an average monthly nominal salary of 292.3 AZN.

The total output of goods and services in the district amounted to 171.8 million AZN, of which 6,688.8 thousand AZN came from industrial production, 80,121.0 thousand AZN from agricultural products, 160,092.0 thousand AZN from retail trade turnover, and 37,397.2 thousand AZN from investments in fixed capital. In 2022, 1,096 new jobs were created in the Ismayilli District, of which 816 were permanent. There were 73 officially registered unemployed people in the district.

There are 16 industrial enterprises operating in the Goygol District. In 2017, the total value of industrial products produced by these enterprises amounted to 10,071.0 thousand AZN, with the private sector accounting for 54.4% of this amount. The total number of employees in industrial enterprises in 2023 was 761, with an average salary of 299.0 AZN. The main industries in the district are the production of oil and dairy products, sewing of carpets and carpet products, production of construction materials, and generation of electricity.

The foundation of the district's economy is agriculture, particularly animal husbandry, crop cultivation, fruit growing, and viticulture. The area under cultivation for agricultural crops is 30,116 hectares for cereals and leguminous crops, 22 hectares for tobacco, 220 hectares for sunflower for seeds, 885 hectares for potatoes, 920 hectares for vegetables, 3,496 hectares for fruits and berries, and 1,121 hectares for grapes. In 2022, the total production of major agricultural products in the district amounted to 444,175 tons, of which 104,796 tons were cereals and leguminous crops, 42 tons were tobacco, 78 tons were sunflower, 10,415 tons were potatoes, 8,820 tons were vegetables, 9,108 tons were fruits and berries, and 4,124 tons were grapes.

One of the main sectors of the district's agricultural sector is animal husbandry. According to data from 2022, the district had 51,765 head of cattle, 180,730 head of sheep and goats, 304 head of pigs, 281,885 head of poultry, and 17,053 bee colonies. The production volume of livestock products in 2022 included 3,102 tons of slaughtered meat, 35,506 tons of milk, 10,300 eggs, and 408 tons of wool.

One of the rapidly developing economic activities in the Ismayilli District is tourism. The enchanting nature of the district's foothills, middle and high mountainous zones, along with its valuable historical and architectural monuments, the Ismayilli Reserve, and the Shahdag National Park, have created a foundation for the rapid development of this sector from the perspective of both local and international tourism.

According to statistical data from 2022, there were 20 hotels in the Ismayilli District, with a total of 325 rooms and a capacity of 816 beds. In that year, the number of guests accommodated in hotels was 8,304, and the number of overnight stays was 9,437.

Among the settlements within the project's area of influence, the most developed is the village of Kurdmashy, where the main agricultural sectors are animal husbandry, crop cultivation, and winemaking. The village has vineyards with a total area of 250 hectares and a winery founded in 1949. The residents of Qubakhaliilli, the main settlement in the area of influence, are engaged in crop cultivation and animal husbandry.

Education

According to the results of the latest statistical research conducted in 2018, there are 10 preschool institutions and 77 full-time general education institutions operating in the Ismayilli District. The number of children enrolled in preschool institutions was 390, and the number of students in general education institutions was 12,029. For the purpose of public education, the district has 39 public libraries with a total collection of 368,200 books, 22 cultural clubs, and 3 museums.

According to the 2009 census, among the population aged 15 and over in the district, 4,305 had higher education (1,420 women), 3,679 had secondary specialized education (1,626 women), 39,450 had complete secondary education (20,053 women), 8,831 had general secondary education (5,003 women), and 3,048 had primary education (2,139 women). The number of people without education was 948 (660 women).

In the settlements within the project's area of influence, there are 2 full secondary schools (Qubakhaliilli Village Full Secondary School and Ceyhun Hasanov Kurdmashy Village Full Secondary School), 23 clubs, and 1 library (in Kurdmashy village).

Healthcare

The Ismayilli District has 3 hospitals and 15 polyclinics. The district hospitals have a total capacity of 190 beds, which translates to 21.9 beds per 10,000 people. Notably, this figure is significantly lower than the

national average of 46.7 beds per 10,000 people. In terms of medical personnel, the district employs 100 physicians and 329 nurses. According to 2018 statistics, there are 11.5 physicians and 37.9 nurses per 10,000 people. Each settlement within the project's area of influence has a medical clinic.

Transport and Communications

The Ismayilli District has a total of 450 km of operational roads, consisting of 35 km of third-class roads, 339 km of fourth-class roads, and 41 km of fifth-class roads. In 2017, 2,339,000 tons of cargo and 8,695,000 passengers were transported via the district's roads and automobile transportation. There are 7,943 registered vehicles in the district, including 925 cargo trucks, 80 buses, 6,860 passenger cars, and 30 special-purpose vehicles.

The Ismayilli District has 26 post offices. The number of landline telephones per 100 households in the district is 61, with 70 in urban areas and 57 in rural areas.

7.4.5. Goychay

General information[54]

Goychay District is one of the 66 districts of Azerbaijan. Located in the centre of the country, it belongs to Central Aran Economic Region. The district borders the districts of Aghdash, Qabala, Ismayilli, Kurdamir, and Ujar. Its capital and largest city is Goychay. As of 2020, the district had a population of 117,0. It is famous for its pomegranate growing industry, and for its pomegranate festival.

Goychay region is located in Shirvan valley, at the footsteps of Greater Caucasus Mountain range. It stretches for about 25 km from north to south and 40 km from east to west, making up 726 km2 in total. The capital of the district Goychay lies on the 216th km of Baku-Qazakh Highway and 18 km away from Ujar railway station.

Geographically, the region is divided into mountainous terrain and lowlands. The distance between Goychay region and capital Baku is 226 km. The region consists of a city and 55 villages.

Demography

According to the statistical data of 2022, there are 117.8 thsd people living at the Dashkesan district’s territory. With an average population density of 159-person s/km2, 29.07% of the district’s population are living in towns and urban-type settlements, while 70.93 reside in the rural areas. 28.6% of the urban and 71.4% of the rural population are males. Population of Goychay town is 34254 people.

54 https://en.wikipedia.org/wiki/Goychay_District

According to 2019 population census, there were 115057 Azerbaijanis, 16 Russians, 203 Lezgins, 5 Jews, 4 Tatarians, 3 Ukrainians, 11 Turkish people and 15 representatives of the other nationalities living at the district's territory.

30.4% of the district's population are at the age of 0-19, whereas 61.5% belong to the age group of 20-65. According to 2022 statistics, natural increase of population was 6.8 persons / 1000 people.

Socioeconomic indicators

The name of the region was taken from Goychay River which means "Blue River" in Azerbaijani language due to the very clean nature and transparency of the river and light blue colour of the water. Due to a 1859 earthquake in Shamakhi, many of its residents moved to the west establishing a village of Goychay. Because of demographic growth, the Russian Imperial government created Goychay Uyezd within Baku Governorate during its administrative reforms in December 1867. The region was established as an administrative unit of Azerbaijan SSR on 8 August 1930.

The economy Goychay district is based on industrial agriculture, consumer market, transportation, and communication. The total value of goods produced by various enterprises, organizations, and individuals operating in the region was approximately 248,331.0 thousand AZN according to the statistics of 2016. The share of industry in economy was 32077,6 thousand AZN or 12,9% of the total output, 88641,4 thousand AZN or 35,7% in agriculture, 27019,9 thousand AZN or 10,9% in construction, 4719,9 thousand AZN or 1,9 percent in transportation, 805.2 thousand AZN or 0.3 percent in communication, 95067.0 thousand AZN or 38.3 percent in trade and services. Goychay is also famous for its wine-making industry which started rapidly growing in the 1970s. In the 1970s and 1980s, pomegranate refining factory, cotton factory, milk production plant, bread making plant, grape products refinery plants were built. Economic sector of the region is agriculture. This sector is based upon grain-growing, cattle-breeding, silkworm-breeding, grape and fruit growing.

According to 2023 statistics55, there are 15743 economic transactors in Goychay district, 973 of which have a status of legal entities. Number of the salaried employees is 11.8 thds persons. The district's average nominal wage of 516.1 AZN/month (303.58$). By this indicator, Goychay occupies the 3rd position among the other districts of the Central Aran Economic Region (next to Aghdash and Kurdamir).

As of 2022, the district's gross production output was 381.5 mln AZN, of which 41.5 thsd AZN were on the industry and 183.6 thsd AZN on agriculture. 64.4 thds AZN were on the Investments in fixed capital. In 2022, 61 new job places have been opened in Goychay. 4142 persons are registered as unemployed.

The major agricultural outputs of the region are grain, fruits, vegetables, and dairy products related to livestock. Potatoes, melons, and grapes are also cultivated in the local farms.

55 https://www.stat.gov.az/source/labour/?lang=en

Sown area of the agricultural crops equals 20469 ha, of which 12695 ha are used under cereals and dried pulses, 192 ha under potato, 678 ha under vegetables, 57 ha under the cucurbits crop and 6847 ha under fruits and berries. For 2022, the total of 187570 tons of plants have been grown at the district's territory, including 43861 tons of cereals and dried pulses, 3072 tons of potato, 50515 tons of vegetables, 1277 tons of cucurbits crop, 508 tons of grapes and 88337 tons of fruits and berries.

Education

As of the most recent statistical data of 2022, there are 34 pre-school and 57 general education institutions at the district's territory. Number of children attending the pre-school education facility equaled 1397 persons, while the number of children gong to general education facilities amounted to 18462 pupils. In order to increase the education and awareness level of the local population, there are 37 public libraries with a total fund of 312,4 thsd books, 27 clubs and 3 museums. According to 2022 population census, of those who are at the age of above 15, 10440 persons have had higher (5331 women), 7820 have secondary specialized (4279 women), 16072 have complete secondary (7937 women), 9084 have general secondary (4674 women) and 1227 have primary (669 women) education. 247 persons (142 women) have had no education at all56.

Healthcare

According to a statistical data of 2022, there are 1 hospital and 18 polyclinics operating at the territory of Goychay district. Local hospitals offer the total 160 of hospital beds, which means 13.6 beds for every 10000 of the district's population. It must be emphasized that this indicator is by 65% lower than the Republic's average indicator (38.8)57. When it comes to the district's medical personnel, for the period of 2015-2022 the number of doctors reduced from 202 to 175, and the number of paramedical staff reduced from 547 to 448. As of 2022, there were 14.8 doctors and 38.0 paramedics for every 10000 of the local population, which is far below the Republic's respective average indicators.

Transport and Communications

For 2022, total length of the roads in Goychay district equals 321 km, including 45 km of 2nd, 191 km of 4th, and 8 km of 5th Category roads58. The total of 658 thsd tons of cargo and 10116 thsd passengers have been transported by the district's road infrastructure in 2022. There are 16323 vehicles registered in the district, including 1861 trucks, 160 buses and 14106 private vehicles.

56 https://www.stat.gov.az/source/regions/?lang=en
57 https://www.stat.gov.az/source/healthcare/
58 https://www.stat.gov.az/source/transport/?lang=en

For 2022, the district had 27 operating post offices. Per every 100 people, there were 41 fixed telephone lines (89 in the urban and 24 in the rural areas).

7.4.6. Aghdash

General information[59]

Aghdash district It is located in the centre of the country, in the Central Aran Economic Region. The district borders the districts of Yevlakh, Shaki, Oghuz, Qabala, Goychay, Ujar, Zardab, and Barda. Its capital and largest city is Aghdash. Aghdash suffered considerable damage during the June 4, 1999 earthquake but has since been thoroughly repaired. Located on the Shirvan Plain, 10 km northeast of the Laki railway station on the Tbilisi-Baku highway. The area of the district is 1.020 km2.

Aghdash city was established in the 16th century located at Arash on the silk road. The city is located in a convenient geographic place having propitious weather conditions such as mild and dry subtropical climate. The Turyanchay River, the Kur River and the Shirvan Canal crosses the territory. There are unique Tugay forests along the Kur, which end in Turyanchay State Reserve. Also, there are beautiful gardens in Aghdash. The territory of the region mainly consists of the plain, low mountain chain Bozdag, of about 700 m height located on the north part.

Demography[60]

According to the statistical data of 2023, there are 106326 people living at the Aghdash district's territory. With an average population density of 104 persons/km2, 34150 (32.12%) of the district's population are living in towns and urban-type settlements, while 72176 (67.88%) reside in the rural areas. 31.35% of the urban and 68.65% of the rural population are males. Population of Aghdash town is 30319 people.

According to 2023 population census, there are 99.85% Azerbaijanis. Other ethnic groups such as the Lezghins, the Kurds, the Tats make up the other 0.15% of the Aghdash district population.

31353 people (29.4%) of the district's population are at the age of 0-19, whereas 66924 people (63.0%) belong to the age group of 20-64. According to 2023 statistics, Crude rate of the district's population increase was 7.5 persons / 1000 people.

Socioeconomic indicators[61]

The core economy of the region is agriculture. Cotton-growing has started to evolve since the 19th century. The region has the potential of producing 20–25 tonnes of cotton. Moreover, in recent years it has become

59 https://en.wikipedia.org/wiki/Absheron_District#cite_note-book-3
60 https://www.stat.gov.az/source/demoqraphy/
61 https://www.stat.gov.az/source/system_nat_accounts/?lang=en

a priority to develop rice-paddy growing in extreme salinity sites. Silk-worm breeding is considered to be one of the ancient and traditional fields at the region.

The industry is relatively developed in the district. The main industrial sector of the district is processing. Leki Ginning Factory produces seedless raw cotton which provides 75–85% of all regional industrial production. In addition to that, the region has a developed plastic material and textile industry (Khosrov Metalplastmas Plant, Aghdash Industrial Plant), food industry (Aghdash Bread-Making Plant, Aghdash Foodstuffs Plant) and production of construction materials (Kukel Brick Plant). Recently, "Orelay" and "FA com BICA" sweets production enterprises, "Arash" cooling water and "Arshin Malchin" textile plants have been put into operation in the region.

According to 2023 statistics, there are 11662 economic transactors in Aghdash district, 646 of which have a status of legal entities. Number of the people employed by the district's economic facilities is 10.8 thsd persons. The district's average nominal wage of 505.2 AZN/month (297$). With this indicator, Aghdash district occupies the last place between the other 6 districts.

As of 2022, the district's gross production output was 465871,5 mln AZN, of which 106078 thsd AZN were on the industry, 428078,3 thsd AZN on the trade, and 17620,6 thsd AZN on the capital investments. In 2022, 167 new job places have been opened in Aghdash. 4022 persons are registered as unemployed.

Aghdash is known as the country's districts with traditionally developed agricultural sector, which consists mainly of cattle breeding, plant growing, bee keeping and poultry.

In 2022, the farms contained 104528 heads of cattle, 79482 heads of sheep and goats, and 300636 heads of poultry. Bee families 8239 unit. In 2022, the district's agricultural facilities produced 6711 tons of meat (in slaughtered weight), 63608 tons of milk, 25178 thsd units of egg and 161 tons of wool.

Sown area of the agricultural crops equals 21807 ha, of which 16456 ha are used under cereals and dried pulses, 199 ha under potato, 1435 ha under vegetables and 3716 ha under fruits and berries. As of the beginning of 2023, the total of 123871 tons of plants have been grown at the district's territory, including 48349 tons of cereals and dried pulses, 1942 tons of potato, 34185 tons of vegetables, and 39393 tons of fruits and berries.

Education[62]

As of the most recent statistical data of 2022, there are 30 pre-school and 68 general education institutions at the district's territory. Number of children attending the pre-school education facility equalled 1077 persons, while the number of children gong to general education facilities amounted to 16574 pupils. In order to increase the education and awareness level of the local population, there are 70 public libraries with a total fund of 368,9 thsd books, 46 clubs and 3 museums. According to 2019 population census, of

62 https://www.stat.gov.az/source/education/

those who are at the age of above 7354 persons have had higher (3601 women), 8110 have secondary specialized (4723 women), 45405 have complete secondary (22720 women), 10602 have general secondary (5380 women) and 2732 have primary (1431 women) education. 370 persons (195 women) have had no education at all.

Healthcare63

According to a statistical data of 2022, there are 1 hospital and 15 polyclinics operating at the territory of district. Local hospitals offer the total 170 of hospital beds, which means 16.0 beds for every 10000 of the district's population. When it comes to the district's medical personnel, for the period of 2015-2022 the number of doctors reduced from 140 to 113, and the number of paramedical staff reduced from 606 to 564. As of 2022, there are 10.6 doctors and 53.0 paramedics for every 10000 of the local population.

Transport and Communications[64]

As of the beginning of 2023, total length of the roads in district equals 313 km, including 23 km of 1st, 67 km of 3rd, 199 km of 4th, and 24 km of 5th Category roads. The total of 925 thsd tons of cargo and 10394 thsd passengers have been transported by the district's road infrastructure in 2022. There are 11939 vehicles registered in the district, including 1153 trucks, 199 buses and 10516 private vehicles.

As of the beginning of 2023, the district had 29 operating post offices. Per every 100 people, there were 24 fixed telephone lines (47 in the urban and 13 in the rural areas).

7.4.7. Yevlakh

General information[65]

Yevlakh District. It is located in the centre of the country and belongs to the Central Aran Economic Region. The district borders the districts of Qakh, Shaki, Aghdash, Barda, Tartar, Goranboy, and Samukh. Its capital and largest city is Yevlakh. The area of the district is 1470 km2.

The Yevlakh region includes one city, 46 villages, 3 towns, 19 administrative-territorial districts, 32 municipalities.

Yevlakh is 287 km far from Baku on the right bank of the Kur waterway. (South-east of Ganja-Gazakh plain, the north-western portion of Shirvan and Garabagh fields). Yevlakh is on the old Silk Way. There are a mild-warm semi-desert and dry field climate within the winter. Kur waterway, Inchachay, Korchay and Alican

63 https://www.stat.gov.az/source/healthcare/?lang=en

64 https://www.stat.gov.az/source/transport/?lang=en

65 https://en.wikipedia.org/wiki/Yevlakh_District

passes through the domain. In the south eastern portion of Mingachevir water store, the Varvara water store is found in Yevlakh. Upper Garabagh and Upper Shirvan canals are within the district.

Demography[66]

According to the statistical data of 2023, there are 128400 people living at the Yevlakh district's territory. With an average population density of 87 persons/km2, 72000 (56.08%) of the district's population are living in towns and urban-type settlements, while 56400 (43.92%) reside in the rural areas. 55.08% of the urban and 44.92% of the rural population are males. Population of Yevlakh town is 64574 people.

According to 2023 population census, there are 99.65% Azerbaijanis. Other ethnic groups such as the Lezghins, the Kurds, the Russians, the Tats make up the other 0.35% of the Yevlakh district population.

41384 people (32.23%) of the district's population are at the age of 0-19, whereas 76751 people (59.78%) belong to the age group of 20-64. According to 2023 statistics, Crude rate of the district's population increase was 9.0 persons / 1000 people.

Socioeconomic indicators67

Yevlakh city is rich with natural resources like clay mixture sand deposits, as well as clay, sand and gravel deposits needed for brick making.

Baku-Gazakh highway, Yevlakh-Balakan, Baku-Tbilisi railway, Baku-Supsa gas and Baku-Tbilisi-Jeyhan oil pipeline extend through the territory of the district. The Yevlakh city also has a domestic airport, which has been operating since 2013.

According to 2023 statistics, there are 18747 economic transactors in Yevlakh district, 927 of which have a status of legal entities. Number of the people employed by the district's economic facilities is 13.0 thsd persons. The district's average nominal wage of 545.3 AZN/month (321$). With this indicator, Yevlakh district occupies the first place between the other 6 districts.

As of 2022, the district's gross production output was 358000,8 mln AZN, of which 25615,9 thsd AZN were on the industry, 499080,6 thsd AZN on the trade, and 27408,8 thsd AZN on the capital investments. In 2022, 48 new job places have been opened in Yevlakh. 4405 persons are registered as unemployed.

Yevlakh is one of the important agricultural districts of the country. The grain and cotton growing, as well as cattle breeding sectors have played an important role in the city economy. The farmers grow potato, vegetable, water-melon and fruits, as well.

66 https://www.stat.gov.az/source/demoqraphy/
67 https://www.stat.gov.az/source/system_nat_accounts/?lang=en

Sown area of the agricultural crops equals 19468 ha, of which 13347 ha are used under cereals and dried pulses, 137 ha under potato, 2702 ha under cotton, 566 ha under vegetables and 1219 ha under fruits and berries. As of the beginning of 2023, the total of 127159 tons of plants have been grown at the district's territory, including 54123 tons of cereals and dried pulses, 8572 tons of cotton, 10304 tons of sugar beet, 1519 tons of potato, 11032 tons of vegetables, and 14151 tons of fruits and berries.

In 2022, the farms contained 104335 heads of cattle, 179477 heads of sheep and goats, and 455918 heads of poultry. Bee families 6577 unit. In 2022, the district's agricultural facilities produced 5048 tons of meat (in slaughtered weight), 38062 tons of milk, 18182 thsd units of egg and 342 tons of wool.

Education[68]

As of the most recent statistical data of 2022, there are 26 pre-school and 89 general education institutions at the district's territory. Number of children attending the pre-school education facility equalled 1407 persons, while the number of children gong to general education facilities amounted to 17757 pupils. In order to increase the education and awareness level of the local population, there are 45 public libraries with a total fund of 474 thsd books, 40 clubs and 2 museums. According to 2019 population census, of those who are at the age of above 9824 persons have had higher (5231 women), 7535 have secondary specialized (4129 women), 57133 have complete secondary (29573 women), 10339 have general secondary (5329 women) and 3519 have primary (1883 women) education. 708 persons (398 women) have had no education at all.

Healthcare[69]

According to a statistical data of 2022, there are 2 hospitals and 9 polyclinics operating at the territory of district. Local hospitals offer the total 261 of hospital beds, which means 20.3 beds for every 10000 of the district's population. When it comes to the district's medical personnel, for the period of 2015-2022 the number of doctors reduced from 215 to 160, and the number of paramedical staff reduced from 518 to 316. As of 2022, there are 12.5 doctors and 24.6 paramedics for every 10000 of the local population.

Transport and Communications[70]

As of the beginning of 2023, total length of the roads in district equals 249 km, including 29 km of 1st, 45 km of 2nd, 48 km of 3rd and 127 km of 4th Category roads. The total of 1496 thsd tons of cargo and 18351 thsd passengers have been transported by the district's road infrastructure in 2022. There are 13649 vehicles registered in the district, including 1533 trucks, 302 buses and 11704 private vehicles.

68 https://www.stat.gov.az/source/education/
69 https://www.stat.gov.az/source/healthcare/?lang=en
70 https://www.stat.gov.az/source/transport/?lang=en

As of the beginning of 2023, the district had 28 operating post offices. Per every 100 people, there were 63 fixed telephone lines (67 in the urban and 59 in the rural areas).

7.4.8. Mingachevir

A. General information[71]

Mingachevir is the fourth largest city in Azerbaijan with a population of about 106,000. It is often called the "city of lights" because of its hydroelectric power station on the Kur River, which divides the city down the middle.

The area of the city is 139.53 km2. Mingachevir is situated 55 meters above sea level on the foothill of the southeast of the Bozdag Mountain chain and on the edge of the Mingachevir reservoir in the Kur-Araz lowland in central Azerbaijan. The city was built in a mild and warm zone and has warm and dry summers and mild winters. The average annual temperature is 14 - 15 °C, highest temperature 42 °C (July–August) and the lowest temperature (January–February) -10 °C. The average annual rainfall is 250–300 mm.

The city lies on both banks of the Kur River - a 1515 km-long river, which is the biggest and longest one in the South Caucasus. Mingachevir is situated 280–300 km west of the capital of the republic, Baku

Mingachevir is situated 55 meters above sea level on the foothill of the southeast of the Bozdag Mountain chain and on the edge of the Mingachevir reservoir in the Kur-Araz lowland in central Azerbaijan. The city was built in a mild and warm zone and has warm and dry summers and mild winters.

Demography

According to the statistical data of 202272, the population of Mingachevir city is 102.4 thsd people. The average population density of 731 persons/km2.

According to 2022 population census, there are 101084 Azerbaijanis, 89 Russians, 6 Ukrainians, 8 Kurds, 12 Turkish, 1 Sakhur, 3 Tatarians, 3 Georgians, 1 Jewish, 2 Armenians and 16 representatives of the other nationalities living in the city.

30.3% of the city's population are at the age of 0-19, whereas 60.5% belong to the age group of 20-65. According to 2022 statistics, Crude rate of the city population increase was 4.5 persons / 1000 people.

Socioeconomic indicators

Mingachevir has been developing rapidly over the last 54 years since it has been established. It is currently considered to be the fourth most developed city of the country both for its economic potential and the

71 https://en.wikipedia.org/wiki/Mingachevir#Economy
72 https://www.stat.gov.az/source/regions/?lang=en

number of inhabitants, it is one of the most important cities of the republic in terms of energy, industry, science, education and culture.

The current city was founded in 1948, partly by German prisoners of war captured during World War. The city forms an administrative division of Azerbaijan.

The basis of the industry of Mingachevir city is electricity, gas, and steam production, distribution and supply, production of computer, electronic and optical products, production of electrical equipment, production of food products, production of yarn, production of building materials and production of finished metal products.

The "Shahar" substation with a capacity of 80 MVA at 110/35/6 kV, the "Mingachevir" substation with a capacity of 10 MVA at 35/6 kV, the "Karkhana 601" substation with a capacity of 16 MVA at 35/6 kV, and the "Az.İES" (Azerbaijan Thermal Power Plant) substation with a capacity of 10 MVA at 110/6 kV are in operation in the city area. There are 380 transformers with a total capacity of 136,165 KVA. The city's electricity is supplied by 0.4 kV power transmission lines (PTL) with a length of 371.6 km, 6 kV overhead and cable lines with a length of 267.8 km, and 35 kV overhead lines with a length of 12.5 km.

Mingachevir is a city in Azerbaijan famous for its reservoir known as the "Mingachevir Sea" which provides water to nearby regions. The official language in the city is Azerbaijani. Archaeologists have discovered many historical monuments in the area dating from the 2nd millennium BC to the 17th century, including settlements, cemeteries, and Christian churches.

The construction of the hydroelectric power station started immediately after the war. This marked the start of systematic and planned research of Mingachevir as an ancient settlement. A great number of people came to Mingachevir from all districts in Azerbaijan in connection with the construction of the Mingachevir hydroelectric power station, and a total of 20,000 people took part in the construction of this power station. About 10,000 German POWs were among those who contributed to the construction of the power station by the end of the 1940s. The most experienced specialists of the country were involved in the construction of this building site as the biggest hydroelectric power station of the then Soviet Union.

According to 2022 statistics, there are 13585 economic transactors in Mingachevir city, 1285 of which have a status of legal entities. Number of the people employed by the city’s economic facilities is 17.0 thsd persons. The city’s average nominal wage of 536.9 AZN/month (315.8$).

As of 2022, the city’s gross production output was 533813,7 mln AZN, of which 319671,7 tsd AZN were on the industry, 441780,2 thsd AZN on the trade, and 74477,9 AZN on the capital investments. In 2022, 308 new job places have been opened in Mingachevir. 3996 persons are registered as unemployed.

In 2019, there were 36 industrial enterprises operating at the territory of Mingachevir city, producing the gross annual industrial product of 319671,7 thsd AZN.

Mingachevir is one of the large industrial cities of the Republic as well as the "Aran economic region", and it is also engaged in various fields of agriculture.

Sown area of the agricultural crops equals 251 ha, of which 135 ha are used under cereals and dried pulses, 5 ha under potato, 14 ha under vegetables and 97 ha under fruits and berries. For 2022, the total of 406 tons of plants have been grown at the city's territory, including 210 tons of cereals and dried pulses, 45 tons of potato, 60 tons of vegetables, 19 tons of grapes and 72 tons of fruits and berries.

Cattle breeding is traditionally one of the city's agricultural sectors. For 2022, there were 2309 heads of cattle, 4527 heads of sheep and goats, 7285 heads of poultry and 350 families of bees at the city. In 2022, the city's agricultural facilities produced 37 tons of meat (in slaughtered weight), 1181 tons of milk, 154 thsd units of egg and 5 tons of wool.

According to the preliminary estimates of the main areas of the economy in January-December 2023, the output of the city is as follows: the physical volume index of the total output increased by 5.6 percent to 566,370.8 thousand AZN. Industrial product production increased by 3.1 percent to 317,085.4 thousand AZN, agriculture, forestry and fishing increased by 13.1 percent to 1,976.2 thousand AZN, construction increased by 0.5 percent to 56,108.1 thousand AZN, transport and storage increased by 27.3 percent to 16,582.9 thousand AZN, the volume of information and communication services decreased by 41.1 percent to 1,688.0 thousand AZN, and the volume of vehicle repair increased by 12.1 percent to 172,930.2 thousand AZN. The volume of paid services provided to the population increased by 23.4 percent to 81874.6 thousand AZN, public catering turnover increased by 28.7 percent to 9819.1 thousand AZN, retail trade turnover increased by 12.3 percent to 540407.0 thousand AZN at actual prices73.

Also, by the Presidential Decree no. 1077 of the Republic of Azerbaijan dated February 26, 2015, Mingachevir Industrial Park was established. 2 factories (using the "Ring" and "Open End" method) of Mingachevir Textile LLC, registered as a resident of the Mingachevir Industrial Park with an annual production capacity of 20,000 tons of yarn from raw cotton, were put into operation on February 27, 2018.

Education

As of the most recent statistical data of 2022, there are 21 pre-school and 22 general education institutions at the city. Number of children attending the pre-school education facility equaled 2734 persons, while the number of children gong to general education facilities amounted to 17818 pupils. In order to increase the education and awareness level of the local population, there are 13 public libraries with a total fund of 258.5 thsd books, 7 clubs and 3 museums. According to 2019 population census, of those who are at the age of above 15, 9603 persons have had higher (615 women), 7567 have secondary specialized (4711

73 http://mingechevir-ih.gov.az/az/fealiyyet.html

women), 47015 have complete secondary (24776 women), 7428 have general secondary (3882 women) and 975 have primary (497 women) education. 225 persons (129 women) have had no education at all.

There are Mingachevir State University, Mingachevir College of Tourism, and Medical College in Mingachevir. Also, there is a Technical and Humanitarian Secondary School named after the national hero Ruslan Muradov and the Mingachevir City Science, Mathematics, and Humanities Secondary School in Mingachevir.

Healthcare

According to a statistical data of 2022, there are 3 hospitals and 4 polyclinics operating at the territory of Mingachevir. Local hospitals offer the total 372 of hospital beds, which means 36.1 beds for every 10000 of the population. When it comes to the medical personnel, for the period of 2015-2022 the number of doctors reduced from 431 to 370, and the number of paramedical staff reduced from 993 to 850. As of 2022 there are 36.1 doctors and 83.0 paramedics for every 10000 of the local population, which is far below the Republic's respective average indicators.

Transport and Communications

For 2022, total length of the roads in Mingachevir equals 7 km, including 3 km of 2nd and 4 km of 3rd Category roads. The total of 580 thsd tons of cargo and 25995 thsd passengers have been transported by the city's road infrastructure in 2022. There are 12285 vehicles registered in the city, including 1024 trucks, 384 buses and 10624 private vehicles.

For 2022, the city had 11 operating post offices. Per every 100 people, there were 45 fixed phones.

7.4.9. Absheron

General information[74]

Absheron District (Azerbaijani: Abşeron districtu) is one of the 66 districts of Azerbaijan. Located in the east of the country, it belongs to the Absheron-Khizi Economic Region. The district borders the districts of Khizi, Gobustan, Baku, Hajigabul, Salyan, and the city of Sumgait. Its capital and largest city is Khyrdalan. The area of the district is 1970 km2.

Demography[75]

According to the statistical data of 2023, there are 431500 people living at the Absheron district's territory. With an average population density of 219 persons/km2, 318.1 thousand people (74.0%) of the district's population are living in towns and urban-type settlements, while 113.4 thousand people (26.0%) reside in

74 https://en.wikipedia.org/wiki/Absheron_District
75 https://www.stat.gov.az/source/demoqraphy/?lang=en

the rural areas. 160.5 thousand people of the urban (74.0%) and 57.8 thousand people (26.0%) of the rural population are males. Population of Khyrdalan town is 195216 people.

According to 2021 population census, there are 86.6% Azerbaijanis, 14.4% representatives of the other nationalities living at the district's territory.

134228 thousand people (33.36%) of the district's population are at the age of 0-19, whereas 268177 thousand people (66.64%) belong to the age group of 20-64. According to 2023 statistics, Crude rate of the district's population increase was 3.08 persons / 1000 people.

Socioeconomic indicators[76]

Absheron District was founded in 1963 by the Soviet government to assure enough labour force, highly educated professional staff and necessary provisions are given to enterprises and firms, kolkhozes and collective farms, poultry and agrarian industries, construction centres, scientific-research institutes and laboratories present on the territories of Baku and Sumgait.

The basic part of its economy is agricultural production which develops in two directions: plant growing and cattle breeding. More attention in plant growing is given to gardening and olive growing. In the sheep farming, raising the local stock of "Gala" with semi-hard or hard skin prevails. The largest enterprises in the region are Caspian Fish Co Azerbaijan (fish products), Tam-Qida Senaye (food products), Garant İnTime Senaye (construction materials), Azər-Pak (synthetic detergents), Asena Co (equipment for poultry farms), Mətanət-A (construction materials).

Over 107 industrial entities are located in the Absheron district. Private enterprises account for 85% of industrial enterprises. 85% of them are private entities. There are 43 construction enterprises in the area. 52 industrial entities are connected to agriculture and food production and only one, to camel-raising.

According to 2022 statistics, there are 32349 economic transactors in Absheron district, 4338 of which have a status of legal entities. Number of the people employed by the district's economic facilities is 40.3 thousand persons. The district's average nominal wage of 637.7 AZN/month (375$). By this indicator, Absheron occupies the second position among the Absheron-Khizi Economic Region.

As of 2022, the district's gross production output was 1924600,1 mln AZN, of which 708308,7 thsd AZN were on the industry, 1245208,2 thsd AZN on the trade, and 174828,1 thsd AZN on the capital investments. In 2023, 1071 new job places have been opened in Absheron. 11744 persons are registered as unemployed.

Absheron districts agricultural sector, which consists mainly of cattle breeding, plant growing, vineyards.

76 https://www.stat.gov.az/source/system_nat_accounts/?lang=en

In 2022, the farms contained 35755 heads of cattle, 103610 heads of small cattle, and 1.29 million birds. Bee families 1459 unit. The only camel breeding farm in the Republic is located in the village of Kobu. In 2022, the district's agricultural facilities produced 4967 tons of meat (in slaughtered weight), 51186 tons of milk, 125322 thsd units of egg and 205 tons of wool.

Sown area of the agricultural crops equals 5780 ha, of which 200 ha are used under cereals and dried pulses, 7 ha under potato, 695 ha under vegetables and 4766 ha under fruits and berries. As of the beginning of 2022, the total of 141039 tons of plants have been grown at the district's territory, including 268 tons of cereals and dried pulses, 92 tons of potato, 136419 tons of vegetables, and 4260 tons of fruits and berries.

Education[77]

As of the most recent statistical data of 2022, there are 40 pre-school and 42 general education institutions at the district's territory. Number of children attending the pre-school education facility equalled 3892 persons, while the number of children gong to general education facilities amounted to 72536 pupils. In order to increase the education and awareness level of the local population, there are 9 public libraries with a total fund of 210.4 thsd books, 12 clubs and 2 museums. According to 2019 population census, of those who are at the age of above 58411 persons have had higher (27354 women), 24899 have secondary specialized (14528 women), 166027 have complete secondary (7658 women), 33163 have general secondary (16528 women) and 8331 have primary (4009 women) education. 216 persons (132 women) have had no education at all.

Healthcare78

According to a statistical data of 2022, there are 3 hospitals and 18 polyclinics operating at the territory of district. Local hospitals offer the total 236 of hospital beds, which means 5.5 beds for every 10000 of the district's population. When it comes to the district's medical personnel, for the period of 2015-2022 the number of doctors increased from 301 to 344, and the number of paramedical staff increased from 405 to 452. As of 2022, there are 8.0 doctors and 10.5 paramedics for every 10000 of the local population.

Transport and Communications[79]

As of the beginning of 2023, total length of the roads in district equals 105 km, including 66 km of 1st, 18 km of 2nd, 10 km of 3rd, 11 km of 4th Category roads. The total of 968 thsd tons of cargo and 20451 thsd passengers have been transported by the district's road infrastructure in 2022. There are 30675 vehicles registered in the district, including 4229 trucks, 427 buses and 25525 private vehicles.

77 https://www.stat.gov.az/source/education/
78 https://www.stat.gov.az/source/healthcare/?lang=en
79 https://www.stat.gov.az/source/transport/?lang=en

As of the beginning of 2023, the district had 24 operating post offices. Per every 100 people, there were 61 fixed telephone lines (80 in the urban and 14 in the rural areas).

7.4.10. Gobustan

General information[80]

Gobustan District is one of the 66 districts of Azerbaijan. It is located in the east of the country, in the Mountainous Shirvan Economic Region. Having the total area of 1370 km2 (530 sq mi), district borders the districts of Shamakhi, Khizi, Absheron, and Hajigabul. Its capital and largest city is Gobustan. As of 2020, the district had a population of 47,400.

There are 1 city, 1 settlement and 31 villages in Gobustan region. The distance between Gobustan district and Baku is 101 km.

The territory of Gobustan ranges from the shores of the Caspian Sea to Mount Gijaki, the highest point in the eastern part of the Greater Caucasus. Peculiarities of Gobustan landscape are the rocks of lime and sandstone in the middle territory of the district, and mud volcanoes, which are located in the east part of Gobustan.

Demography

According to official statistics the district of Gobustan had a population of 46,4 thsd inhabitants at the 2023; 38,273 of whom were living in rural areas. With an average population density of 34 persons/km2. By the beginning of 2023, the population of the district by gender is as follows: 23363 men and 23021 women.

According to 2019 population census, there are 44401 Azerbaijanis, 24 Russians, 107 Turkish, 3 Ukrainian, 2 Georgians and 2 representatives of the other nationalities living at the district's territory.

34.3 % of the district's population are at the age of 0-19, whereas 59.1% belong to the age group of 20-65. According to 2022 statistics, Crude rate of the district's population increase was 12.5 persons / 1000 people.

Socioeconomic indicators

The name "Gobustan" originated from the word "Gobu", which means "beam" in Azerbaijani. The district's administrative centre, Gobustan was known as Maraza until 2009.

80 https://en.wikipedia.org/wiki/Gobustan_District

Gobustan has outstanding universal value for the quality and density of its rock art engravings, for the substantial evidence the collection of rock art images presents for hunting, fauna, flora and lifestyles in pre-historic times and for the cultural continuity between prehistoric and mediaeval times.

There are Jayirli, Shorsulu, Kolani, Sheikhsarli, Godugqiran, and other mud volcanoes in Gobustan district. The district has various building materials reserves (limestone, sand, gravel), industrially important clays, volcanic ash, gypsum, shale rocks, and other reserves. Meysari (Hachagaya, 1241 m) and Yurtandagh ranges (Yurtandagh, 898 m) in the north, Meraza plateau in the center, and Gichaki ridge (Gichaki, 1047 m) are the main orographic units. It has oil, natural gas, oil shale deposits, construction materials, and many springs and mud volcanoes.

The territory of the district belonged to the neighbouring Shamakhi District from 1930 until 1943 and later again from 1960 until 1990 when it was re-established.

The ancient dwellings used to be in the area of present Gobustan which date back to the Stone Age.

The number of employed populations in the region is 20791 thsd people, and the number of unemployed populations is 1571 thsd people.

According to 2023 statistics, there are 5255 economic transactors in Gobustan district, 392 of which have a status of legal entities. Number of the people employed by the district's economic facilities is 3200 persons. The district's average nominal wage of 579.4 AZN/month (341$). By this indicator, Dashkesan occupies the 1st position among the Mountainous Shirvan Economic Region districts.

As of 2022, the district's gross production output was 138153,9 mln AZN, of which 5458,5 thsd AZN were on the industry, 87068,9 thsd AZN on the trade, and 19142,4 thsd AZN on the capital investments. In 2022, 194 new job places have been opened in Gobustan. The number of employed populations in the region is 22362 thsd people, and the number of unemployed populations is 1571 thsd people.

Agriculture is the core of the Gobustan economy. In particular, grain growing and animal husbandry occupy a leading place in the agricultural industry. The annual production of grain is approximately 1 ton per person. Other major agricultural products are potato, cabbage, tomato, grape, pea, sunflower, and melon.

In the first half of 2022, Gobustan produced agricultural products worth 31 million 480 thousand AZN.

According to the regional statistics department, 30 million 5 thousand AZN, or 95.5 percent of products produced in the agricultural industry come from livestock products.

According to the data of 2022, the total cultivated area of agricultural plants in the region is 21910 ha. Of this, 21,724 ha are cereals and dry legumes, 159 ha of potato, vegetable and melon crops, and 214 ha of gardens and orchards.

In 2022, the district's agricultural facilities produced 3347 tons of meat (in slaughtered weight), 22725 tons of milk, 8903 thsd units of egg and 356 tons of wool.

Education

As of the most recent statistical data of 2022, there are 7 pre-school and 30 general education institutions at the district's territory. Number of children attending the pre-school education facility equalled 290 persons, while the number of children gong to general education facilities amounted to 5287 pupils. In order to increase the education and awareness level of the local population, there are 15 public libraries with a total fund of 163.1 thsd books, 2 parks, 15 clubs and 1 museum81.

According to 2022 data, the number of students who graduated from secondary schools and entered higher education institutions in the same year is 158 people, of which 54 are men and 74 are women.

Healthcare

According to a statistical data of 2022, there are 1 hospital and 13 polyclinics operating at the territory of Hajıqabul district. Local hospitals offer the total 70 of hospital beds, which means 15.1 beds for every 10000 of the district's population. According to a statistical data of 2022, there are 1 hospital and 13 polyclinics operating at the territory of Hajıqabul district. Local hospitals offer the total 70 of hospital beds, which means 15.1 beds for every 10000 of the district's population. It must be emphasized that this indicator is by 61% lower than the Republic's average indicator (38.8). To the district's medical personnel, from 2012 to 2022 the number of doctors reduced from 62 to 49, and the number of paramedical staff reduced from 159 to 96. As of 2022, there are 14.6 doctors and 37 4 paramedics for every 10000 of the local population. This indicator is far below the Republic's respective average.

Transport and Communications

As of the beginning of 2023, total length of the roads in Gobustan district equals 186 km, including 51 km of 1st, 46 km of 3rd, and 17 km of 5th Category roads. The total of 565 thsd tons of cargo and 3032 thsd passengers have been transported by the district's road infrastructure in 2022 There were 4814 vehicles registered in the district, including 740 trucks, 43 buses and 3887 private vehicles.

There were 12 operating post offices in the district. Per every 100 people, there were 40 fixed telephone lines (74 in the urban and 29 in the rural areas).

81 https://www.stat.gov.az/source/education/

7.5. Local Baseline

7.5.1. Introduction

This section presents information on the affected communities grouped within the relevant region. It presents the communities that are affected for each of the project infrastructure components and the information on the settlements affected is similarly organised by infrastructure component. The villages are listed where possible from east to west along the infrastructure component. Detailed location maps of the villages grouped into districts are provided below.

Table 7.6 Communities arranged by project infrastructure component

District	Village
Navahi to Azerbaijan TPP	
Hajigabul	Atbulaq, Qizilburun, Navahi, Pirsaat, Ranjbar
Shamakhi	Chol Goylar, Ovculu
Aghsu	Lengebiz, Gashad, Bico, Gagali, Dashdamirbayli, Ulguch, Gharagoyunlu
Ismayilli	Qubakhalilli
Goychay	Garameryem, Garabagghal, Arabchabirli 1, Arabchabirli 2, Mirzahuseyinli
Aghdash	Hushun, Yuxari Agjayazi, Goshagovag, Arabojaghi
Yevlakh	Arash, Yuxari buchag, Gulovsha, Akhsham, Haciselli, Havarli, Salahli, Huruushagi, Tanrigulululular, Boshchali
Mingachevir	Mingachevir
Navahi to Alat substation	
Hajigabul	Rancbar, Pirsaat, Navahi s., Qizilburun, Atbulaq
Absheron	Alat
Navahi to Absheron wind plant	
Hajigabul	Rancbar, Pirsaat Navahi s. Qizilburun, Atbulaq
Gobustan	Gobu
Absheron	Atyali, 28 May
Absheron wind plant to Gobu	
Absheron	Atyali, 28 May
Gobustan	Gobu

7.6. Navahi SS to Azerbaijan TPP

7.6.1. Hajigabul district

Summary of sensitive receptors

In Hajigabul district, the percentage of vulnerable people in the villages varies between 0.6% and 10%, considering the families of martyrs and veterans and the level of poverty as the most actual criteria of vulnerability. For example, in Navahi, Pirsaat and Atbulag villages, people with these criteria make up 5%, 6% and 0.6% respectively of the population of these villages. In Rancbar village, martyr and veteran families and people with low income make up 10% of the population, while in Qizilburun village only 1 martyr family is considered vulnerable.

There is a complete secondary school in each village passed through by the Azure Project in Hajigabul. There are clubs and clubs in Navahi and Ranjbar, and a kindergarten in Qizilburun village. Libraries operate in Pirsaat and Atbulaq villages. Small shops operate in almost every village. Medical points are also operating in each village and are served by one or more nurses. There are mosques in every village; except Pirsaat village, there are graveyards in other villages. There is one holy place in the village of Atbulag. Summary of the vulnerability, social receptors and healthcare data of the district is provided in the table below.

Table 7.7. Vulnerability, Social, cultural and health receptors and health care data: Hajigabul district

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Navahi	2300	1035 (45%)	1265 (55%)	Poverty	5	1 school 1 club 8 commercial units	1 medical point	2 mosques 2 graveyards
Ranjbar	3800	1862 (49%)	1938 (51%)	Poverty Martyr /veteran families	380 10	1 school 1 Club 8 commercial units 10 markets 3 tea houses	1 medical point	1 mosque 1 graveyard
Qızılburun	1902	913 (48%)	989 (52%)	Martyr families	1	1 secondary school, 1 kindergarten 4 markets 2 restaurants	1 medical point	1 mosque 1 graveyard 1 historical monument (XIX century bridge)
Pirsaat	1195	590 (49.3%)	605 (50.7%)	Poor/ Martyr families	116	1 school 1 library 3 markets	1 medical point	1 mosque 1 graveyard 1 sacred place
Atbulag	2464	1158 (47%)	1305 (53%)	Poor/ Martyr families	15	1 school 1 library 4 markets	1 medical point	1 mosque 1 graveyard 1 sacred place

Location map of the Project AoI settlements with most remarkable sensitive receptors is provided in the Figure below.

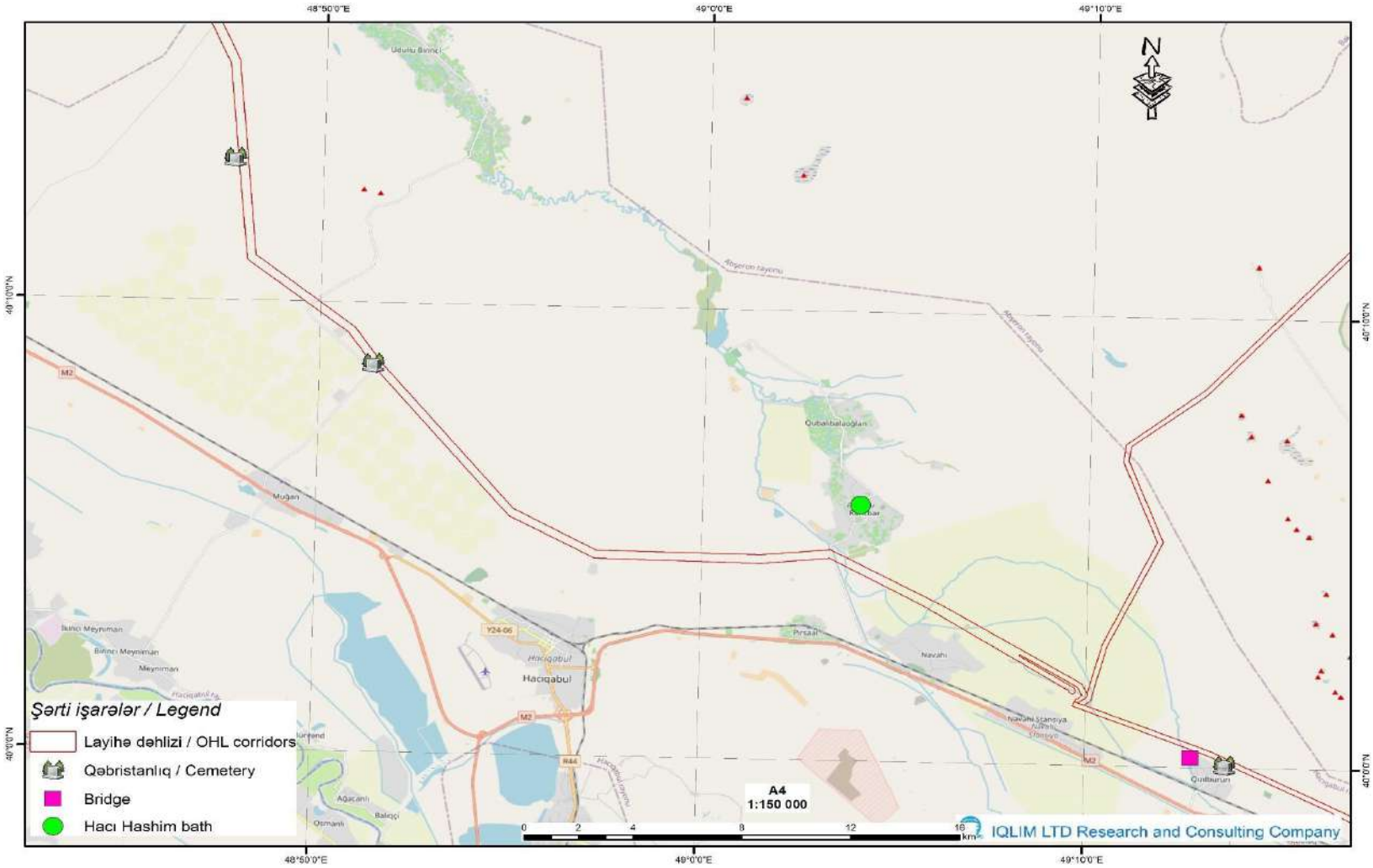


Figure 7.5: Project affected settlements and sensitive receptors: Hajigabul district

Atbulag village

General Information. Atbulaq is a village and municipality in the Hajigabul District of Azerbaijan. The area of Atbulag is 1200 ha. The climate of the village is typically continental, with hot, dry summers and cold winters.

Geographical location. The village of Atbulag is located on the banks of the Pirsaat River, and its territory is in the plains. It got its name from the river of the same name in the area. The original name of the village is Atbulaghi (means spring for watering horses). In the past, the territory of the village was a wintering place for cattle-breeding people. Later, families who moved from Maraza settled here. The village got its name from the water well dug here to water the animals.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 2464, of which 53% are women. The distribution of the population by age is approximately as follows: 27.6% between 0-18 years old, 62.7% between 19-65 years old, and 9.7% over 65 years old. The number of people belonging to the vulnerable group is 0.6%. It includes sick, poor people in the area.

Education. There is one complete secondary school and 1 incomplete secondary school.

Culture. There is one library in the village. There is one mosque and one cemetery in the village.

Healthcare. There is one medical center with nurses that provides primary medical care and initial examinations of illnesses in the village.

Population employment. The population mainly works in the Industrial Zone and at the brick factory. Additionally, the residents are also engaged in private gardening and livestock farming. . Unemployment was raised as an issue by the community members.

Economy. The Hajiqabul Industrial Zone operates in the district, which means that nearby village residents (including those from Atbulag) have access to employment opportunities. The Hajiqabul Industrial Zone was established by the Decree of the President of the Republic of Azerbaijan on July 25, 2017. The residents of the Industrial Zone specialize in various fields, including the production of passenger cars, steel screws of different types and sizes, wood products, plastic containers and packaging, construction materials, fertilizers, and more.

Commercial establishments. 4 shops (1 big), 2 shops are under the construction. There is an industrial park, a poultry factory, and a brick factory in the village.

Historical monuments. There is an ancient sacred site in the village (nearly 100 years old).

Gizilburun (Qizilburun) village

General Information. Gızılburun is a village and municipality in the Hajigabul District of Azerbaijan. The area of Gızılburun is 1600 ha.

Gızılburun is a rural village with a predominantly Azerbaijani population. The community is engaged in agricultural activities and maintains traditional ways of life.

Geographical location. The village of Gızılburun is one of the ancient settlements, with its origins dating back to the 7th-8th centuries. This ancient site, located on the left bank of the Pirsaat River, is situated 95 km from Baku and now lies one kilometer northeast of the current village of Gızılburun.

The Pirsaat River originates from the Shahdag Mountains, which is why the area along the Pirsaat River is predominantly inhabited by people from Shamakhi. In ancient times, people primarily chose locations close to roads and rivers for settlement. Gızılburun, being situated both along the Silk Road and beside the river, has historically been a favourable location.

The village is located in a flat area. In the past, it served as a wintering site for one of the pastoral tribes of Shirvan. The toponym "Qızılburun" is derived from the words "qızıl" (meaning "red") and "burun" (a geographical term here meaning "a protrusion of a mountain into the plain"), and it translates to "red protrusion" or "reddish promontory." The village takes its name from the adjacent hill with the same name.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1902, of which 52% are women. The distribution of the population by age is approximately as follows: 37% between 0-18 years old, 56.7% between 19-65 years old, and 6.3% over 65 years old. The number of people belonging to the vulnerable group is very small. There is 1 shahid's family in the area.

Education. There is one general secondary school and one kindergarten in the village.

Culture. There is one library in the village. In the village, there are two important religious and cultural sites for the community: a cemetery and a mosque. There is a martyr’s alley, and a worship called “Velijan Pir” in the village. There are no recreational facilities or parks in the village.

Healthcare. There is one medical center (first-aid station) with 1 nurse that provides primary medical care and initial examinations of illnesses in the village.

Population employment. The population mainly works in these nearby enterprises: Oil and Gas Extraction Department named after N.Narimanov, Gobustan Transport Department of the Transport Department of SOCAR. In addition, people are engaged in private farming and animal husbandry. Unemployment was raised as an issue by the community members.

Economy. In close proximity to the village, there are notable facilities such as the N.Narimanov Oil and Gas Extraction Department of the State Oil Company of Azerbaijan (SOCAR) and the Gobustan Transportation Office of SOCAR's Transportation Department.

Commercial establishments. There are 4 shops, 2 canteens in the area serving the population. There is an industrial park, a poultry factory, and a brick factory in the village

Historical monuments. Walking along the Pirsat river, you can come across the antiquity of the republic and the region at every inch. Examples of this are the ancient bridges built over the river and Hüseyin Khanagah Sanctuary.

Navahi settlement

General Information. Navahi is a settlement and municipality in the Hajigabul District of Azerbaijan, distinct from the village and municipality of Navahi. Navai was originally a village and later became a settlement. The area of Navahi is 7.000 ha.

Geographical location. Navahi settlement is located northeast of the Hajigabul district on the left bank of the Pirsaat River. It is 20 km from Hajigabul district and 90 km southeast of Baku city. The settlement is adjacent to the Atbulaq, Pirsaat, and Ranjbar villages. It is situated 100 meters away from the section of the Baku-Ganja Silk Road that passes through the Hajigabul area. Additionally, the Navai station is on the railway that runs through the district.

Spring is generally mild, cool, and has little rainfall in Navai. Summer months are accompanied by dry, hot air masses, with temperatures sometimes rising to +45–50 °C. Autumn is characterized by light rain, relatively windy, and frosty conditions. Winter is relatively harsh, with little rain and frosty weather.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 2300 (actual residents), of which 45% are men. The distribution of the population by age is approximately as follows: 30% between 0-18 years old, 60% between 19-65 years old, and 10% over 65 years old. The number of vulnerable people in the settlement is 5%. It includes low-income and sick people.

Education. There is one general secondary school in the settlement.

Culture. There is one Cultural Centre in the settlement which includes a library, club and study groups (associations). In the village, there are two important religious and cultural sites for the community: two cemeteries and two mosques and a martyr’s alley..

Healthcare. There is one medical center (first-aid station) that provides primary medical care and initial examinations of illnesses in the settlement.

Population employment. 45-50% of the population have secondary education, and 50-55% have higher education. There are 500-600 houses in the settlement. The population is engaged in agriculture and animal husbandry.

Economy. The area being considered for the construction of a nuclear power plant (NPP) is located approximately 100 km southeast of Baku, in a desert, seismically favourable zone, near the settlement of Navahi The construction of a nuclear power plant was planned here even during the Soviet era, and it is known that this issue was coordinated with the International Atomic Energy Agency (IAEA) at that time. The village's agricultural fields are irrigated using water from the Pirsaat reservoir.

Commercial establishments. There are 8 commercial establishments in the area serving the population.

Historical monuments. There are no historical monuments in the area.

Ranjbar village

General Information. Ranjbar is a village and municipality in the Hajigabul district of Azerbaijan. The area of Ranjbar village is characterized by a semi-arid climate with hot summers and mild winters.

Ranjbar is a rural village where the population is mainly composed of Azerbaijani ethnic groups. The community is typically engaged in agricultural activities and maintains traditional lifestyles.

The area of Ranjbar is 4.850 ha.

Geographical location. The area of the village is flat. The village was named as such because it was established as a result of the settlement of families of hired laborers (the meaning of the word "ranjbar"). "Ranjbar" is a Persian-origin word meaning "a hireling, a peasant with personal dependence on the landowner."

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 3800, of which 49% are men. The distribution of the population by age is approximately as follows: 31,6% between 0-18 years old, 60,5% between 19-65 years old, and 7,9% over 65 years old. The number of vulnerable people in the village is 10%. It includes families of shahids and veterans, less wealthy people.

Education. There is one general secondary school in the village.

Culture. There is one Cultural Centre in the village which includes a library, club and study groups (associations). In the village, there are two important religious and cultural sites for the community: a cemetery and a mosque.

Healthcare. There is one medical center (first-aid station) with 2 nurses that provides primary medical care and initial examinations of illnesses in the village.

Population employment. The population is engaged in agriculture and animal husbandry. Unemployment was raised as an issue by the community members.

Economy. The village's agricultural fields are irrigated using water from the Pirsaat reservoir.

Commercial establishments. There are ten private shops (also OBA market) and three teahouses in the area serving the population.

Historical monuments. In the central part of the village, there is an ancient bathhouse dating back to the last century.

Pirsaat village

General Information. Pirsaat is a village in the Hajigabul District of Azerbaijan. The area of Pirsaat is 1930 ha. The village was named after the Pirsaat River, which flows nearby. The village was founded in 1903 with the construction of the railway.

Geographical location. The village is located 10 km from the district center of Hajjgabul and 101 km from Baku. The international road Baku—Alat—Tbilisi passes through the village. There is also a Pirsaat railway station in the village. The village is situated at an elevation of 68 meters above sea level.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1195, of which 50.7% are women. The distribution of the population by age is approximately as follows: 32.7% between 0-18 years old, 60.7% between 19-65 years old, and 6.6% over 65 years old. The number of people belonging to the vulnerable group is 6%. It includes families of shahids and veterans and less wealthy people in the area.

Education. There is one general secondary school in the village.

Culture. There is one library in the village. There is one mosque in the village.

Healthcare. There is a medical center with nurses that provides primary medical care and initial examination of illnesses in the village.

Population employment. The population are mainly engaged in private farming. Unemployment was raised as an issue by the community members.

Commercial establishments. There are 3 shops in the area serving the population. There is an industrial park, a poultry factory, and a brick factory in the village.

Historical monuments. There are no historical monuments in the area.

7.6.2. Shamakhi District

Summary of sensitive receptors

Only disabled people in Ovchulu village in Shamakhi distict are considered vulnerable and they make up 1.5% of the village population. In the case of Cholgoylar village, people with low social status (living in poor conditions, ill and with low income) are considered vulnerable and make up 6% of the village population.

Both villages in Shamakhi district have complete secondary schools and small shops. There is also a library in Chol Goyler village. Residents of both villages travel to Goychay or Aghsu towns for medical services. There are no mosques in the villages. There is a cemetery in each of the villages; in Chol Goyler there is also an ancient sacred site on the grounds of the village cemetery.

Table 7.8. Social, cultural, and health receptors: Shamakhi district

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Chol Goylar	246	120 (49%)	125 (51%)	Poverty	15	1 school 1 market	-	1 graveyard
Ovchulu	1614	774 (48%)	839 (52%)	Disabled	24	1 school 1 library 3 markets	-	1 graveyard 1 sacred place

Location map of the Project AoI settlements with most remarkable sensitive receptors is provided in the Figure below.

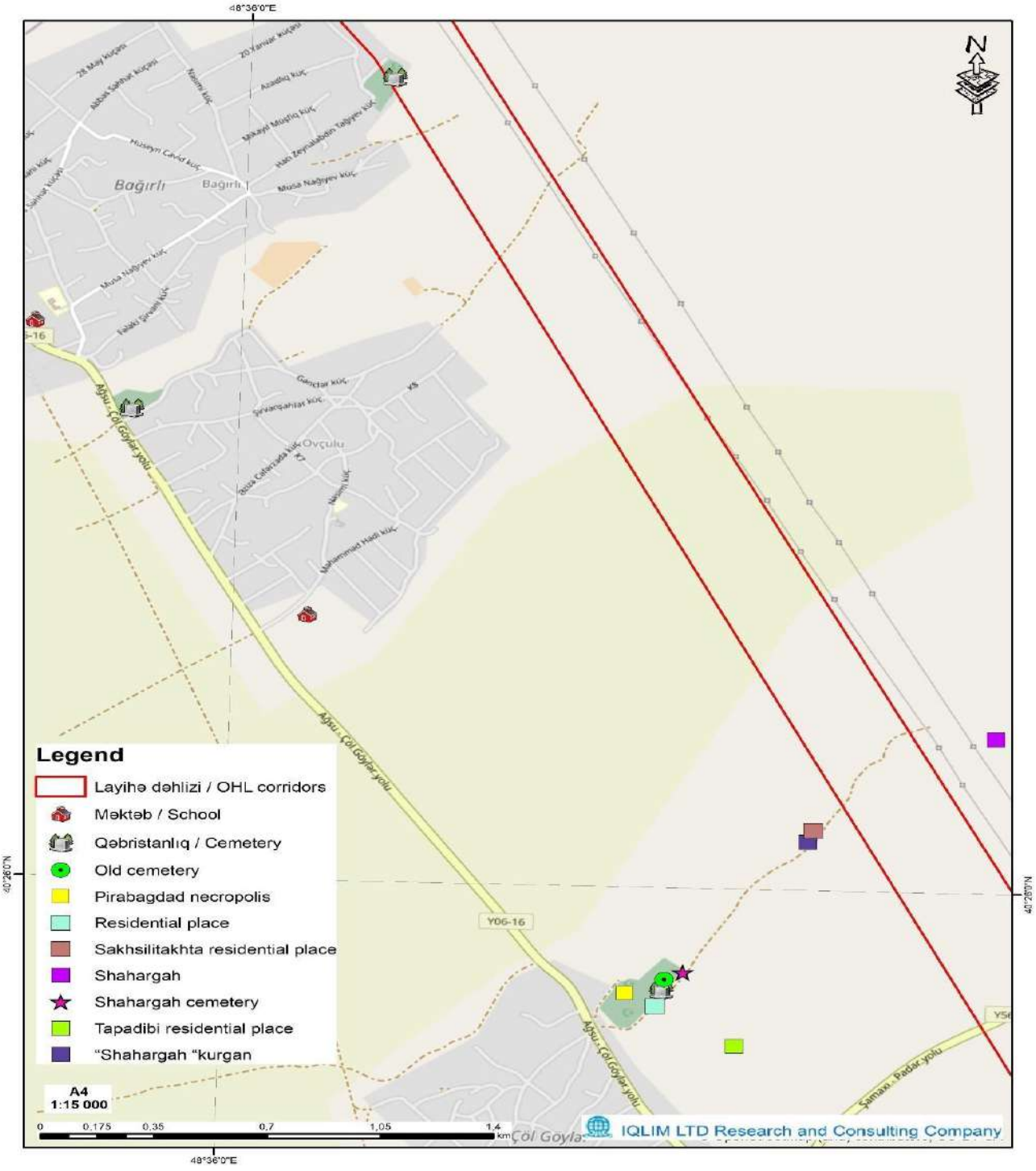


Figure 7.6: Project affected settlements and sensitive receptors: Shamakhi district

Shamakhi villages

Chol Goylar village

General Information. Chol Goylar is a village situated in the Shamakhi District of Azerbaijan. It is known for its rural charm and traditional lifestyle. The village community is deeply connected to local agricultural practices and cultural traditions. The area of Chol Goylar is 60 ha.

Geographical location. Chol Goylar village is 25 km south of the district center, at the foot of the Langabiz range and 148 km of Baku city. The village is positioned in a mountainous and hilly region, typical of the Shamakhi area. The terrain is characterized by its scenic landscapes, which include rolling hills and valleys. The geographical features of Chol Goylar are conducive to certain types of agriculture and provide photosque views of the surrounding natural environment.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 246, of which 49% are men. The distribution of the population by age is approximately as follows: 19% between 0-18 years old, 40.4% between 19-65 years old, and 40.6% over 65 years old. The number of vulnerable people in the village is 6%, it includes low social status, less wealthy.

Education. There is one general secondary school in the village.

Culture. One cemetery in the village.

Healthcare. There is no first-aid station in the village. If necessary, they go to Shamakhi or Aghsu.

Population employment. The population is engaged in farming and livestock. Unemployment was raised as an issue by the community members.

Economy. The economy of Chol Goylar is centered around agriculture, livestock, and traditional crafts, with small businesses playing a role in supporting the village's daily needs. The village's photosque location also offers potential for tourism-related activities.

Commercial establishments. There is 1 private shop in the area serving the population.

Historical monuments. There is the tomb of Sheikh Tahir in the village. The tomb of Sheikh Tahir, a revered figure in Sufism, is located here. This historical and religious site is known for its cultural significance and is often visited by locals and tourists alike. The tomb is part of the rich historical heritage of the Shamakhi region, reflecting the area's deep-rooted spiritual traditions and historical importance.

Ovchulu village

General Information. Ovchulu is a village and municipality in the Shamakhi district of Azerbaijan. It is a rural settlement known for its traditional lifestyle and close-knit community. The village has a rich cultural

heritage and is characterized by its scenic landscapes and agricultural activities. The population consists of families who have lived in the area for generations, preserving the customs and traditions of the region.

The area of Ovchulu is 1000 ha.

Geographical location. Ovchulu village is situated in the Shamakhi District, which is located in the central part of Azerbaijan. Ovchulu village situated at the foot of the Lengebiz ridge, is 35 km south of the district center and 173 km of Baku city. The village is set amidst the photosque landscapes typical of the Shamakhi region, which includes rolling hills, lush greenery, and fertile valleys. The area is known for its mild climate, which is conducive to various agricultural activities. The village's geographical position offers beautiful views and a peaceful rural environment, making it a serene place for residents.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1614, of which 48% are men. The distribution of the population by age is approximately as follows: 13,6% between 0-18 years old, 81.4% between 19-65 years old, and 5% over 65 years old. The number of vulnerable people in the village is 1.5%. It includes families of shahids and veterans, less wealthy people.

Education. There is one general secondary school in the village.

Culture. There is one library. In the village, there is an ancient sacred site (more than 200 years old) inside the cemetery.

Healthcare. No first-aid station in the village. If necessary, they go to Shamakhi and Aghsu.

Population employment. The population is engaged in private household, and farming. Unemployment was raised as an issue by the community members.

Economy. The economy of Ovchulu village is predominantly based on agriculture and related activities. Ovchulu village's economy is closely tied to the land and its natural resources, with agriculture and livestock farming being the primary sources of livelihood. The village's scenic location and traditional way of life make it a unique and culturally rich community within the Shamakhi District.

Commercial establishments. There are three shops in the area serving the population.

Historical monuments. There are no historical monuments in the village.

7.6.3. Aghsu District

Summary of sensitive receptors

During the consultations with the municipalities and the representatives of the Executive Agency in each village, the participants came up with different criteria of vulnerability in their villages. During the discussions, some referred to the criteria approved by national legislation, others to their perception of vulnerability in their respective villages.

For example, in the villages of Lengebiz and Bicho in Agsu Region, single women over the age of 55 with low incomes and occasional employment are considered vulnerable, representing approximately 0.5% and 0.9% of the population of these two villages respectively.

In Gagali village, in addition to single elderly women, disabled people, orphans and university students from low-income families are considered vulnerable by the village population. There, 9.15% of the population falls into this category.

In the other villages, Dashdamirbayli (1.3%), Gharagoyunli (0.5%), Ulguch (1.2%) and Gashad (2.1%), the families of martyrs and veterans of the first and second Garabagh wars are considered vulnerable.

All the villages crossed by the Azure Project have at least one incomplete secondary school and one medical point staffed by at least one nurse. The presence of complete secondary schools and other social receptors (clubs, libraries, etc.) varies according to the number of village population.

In the most densely populated village of Gadali, there are one complete and one incomplete secondary school, one library and one cultural centre in operation, while only one medical point with one nurse provides medical services to the population of the village. The second most populous village, Gharagoyunlu, has a complete secondary school, a kindergarten, a library and a cultural centre. A medical point with a doctor provides medical services to the population. The sparsely populated village of Ulguch has a complete secondary school operating in the village. No medical services are provided in the village, people go to the neighbouring village at a distance of 1 km. Except for Dashdamirbeyli and Gashad villages, almost all villages have mosques in the village area; except for Gadali village, there are graveyards in the area of other villages.

Table 7.9.Social, cultural, and health receptors: Aghsu district

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Langabiz	1480	750 (50.7%)	730 (49.3%)	Single women	7	1 school 1 library 2 markets	1 medical point	1 mosque 1 graveyard
Bijo	2151	1150 (53.5%)	1001 (46.5%)	Single women	20	2 schools 1 library 1 club 3 markets	1 medical point	1 mosque 2 graveyards
Gadali	4523	2247 (49.7%)	2276 (50.3%)	Poverty Disabled Single women Martyr families Veterans	413	2 schools 1 library 1 club 9 markets 2 teahouses 2 barbershops	1 medical point	1 mosque 1 graveyard
Dashdamirbeyli	1160	592 (51%)	568 (49%)	Poverty Disabled Martyr families Veterans	15	1 school 1 library 2 markets	-	1 graveyard
Garagoyunlu	3938	1932 (49.1%)	2006 (50.9%)	Martyr families	20	1 school 1 kindergarten 1 club 1 library 1 market	1 medical point	1 mosque 1 graveyard 2 historical monuments
Ulguj	623	320 (51.4%)	303 (48.6%)	Martyr/veteran families	7	1 school 3 markets	-	1 mosque 1 graveyard
Gashad	1239	576 (46.5%)	663 (53.5%)	Martyr/veteran families	27	1 school 1 market	-	1 graveyard

Location map of the Project AoI settlements with most remarkable sensitive receptors is provided in the Figure below.

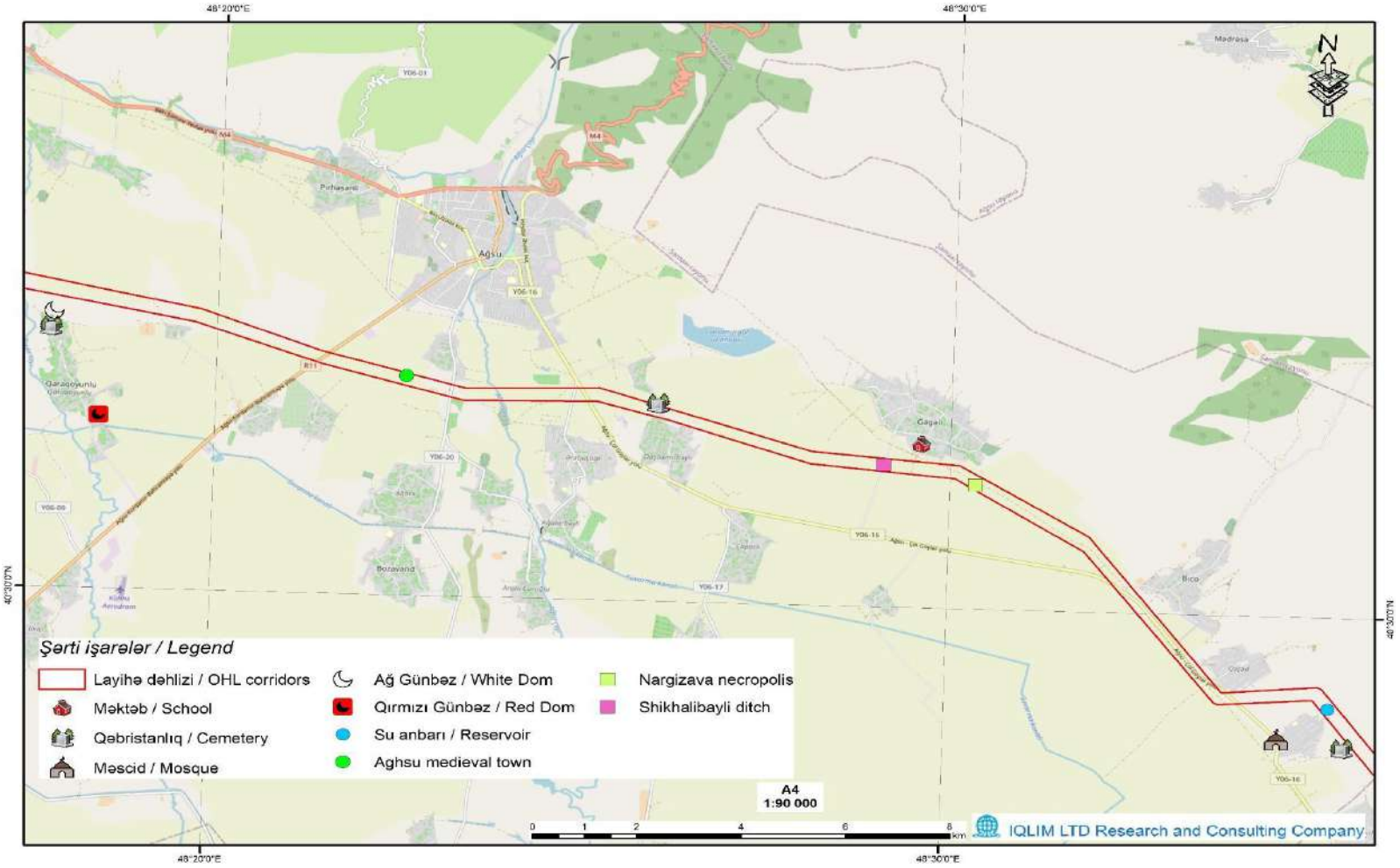


Figure 7.7: Project affected settlements and sensitive receptors: Aghsu district

Aghsu villages

Langabiz village

General Information. Langabiz is a village and municipality in the Aghsu Districkt of Azerbaijan. Langabiz is a rural village, and its population consists mainly of local Azerbaijanis, who have traditionally relied on agriculture and related activities for their livelihood. The area of Langabiz is 2525 ha.

Geographical location. The village of Langabiz became part of the Qoshun district of the Shirvan province in the early 19th century. According to documents from 1824, the village had a population of 30 families.

The village is set in a mountainous area, contributing to its photosque landscape. The Aghsu District itself is known for its varied terrain, ranging from mountains to flat plains. Langabiz is relatively close to other important settlements in the district and is part of a region rich in history and culture.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1480, of which 50.6% are women. The distribution of the population by age is approximately as follows: 37.4% between 0-18 years old, 58.35% between 19-65 years old, and 4.25% over 65 years old. The number of people belonging to the vulnerable group is 0.5%. It includes lonely people in the area.

Education. There is one complete secondary school.

Culture. There is one library in the village. There is one mosque and one cemetery in the village.

Healthcare. There is one medical center with paramedic that provides primary medical care and initial examinations of illnesses in the village.

Population employment. The population is engaged in crop farming, mainly beekeeping. Unemployment was raised as an issue by the community members.

Economy. The economy of Ləngəbiz village, like many rural areas in Azerbaijan, is likely based on agriculture and livestock. Key aspects of the local economy include agriculture and livestock. The village likely engages in crop cultivation, including grains, fruits, and vegetables. The fertile land and favourable climate conditions in the region support various types of farming. Animal husbandry, including the raising of cattle, sheep, and goats, is probably a significant economic activity. This provides meat, dairy products, and wool, which can be used locally or sold in nearby markets.

Commercial establishments. There are 4 private shops in the area serving the population.

Historical monuments. While Langabiz village itself might not be widely known for specific historical monuments, the broader region of the Aghsu District has a rich history and several notable sites.

Gashad village

General Information. Gashad is a village located in the Aghsu District of Azerbaijan. It is part of a region known for its agricultural activities and traditional lifestyle. The village is characterized by its rural setting, where community life often revolves around local customs and practices. The area of Gashad is 2050 ha.

Geographical location. The village is positioned in a region that features a mix of flat plains and rolling hills. This geographical setting provides a favourable environment for agriculture and livestock farming. The village is well-connected to nearby towns and cities, making it accessible for trade and transportation.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1239, of which 53.5% are women. The distribution of the population by age is approximately as follows: 27% between 0-18 years old, 64% between 19-65 years old, and 9% over 65 years old. The number of people belonging to the vulnerable group is 2.1%. It includes families of martyrs and veterans of Karabakh war.

Education. There is one complete secondary school.

Culture. There is one library in the village. There is one cemetery in the village.

Healthcare. There is one medical center with one nurse who provides primary medical care and initial examinations of illnesses in the village.

Population employment. The population is engaged in animal husbandry, beekeeping. The proximity to nearby industrial and commercial facilities, such as those in Aghsu District, provides additional employment opportunities for the residents of Gashad. Unemployment was raised as an issue by the community members.

Economy. The economy of Gashad village is predominantly based on agriculture and livestock. Key economic activities include:

Agriculture: The village engages in the cultivation of various crops, such as grains, fruits, and vegetables. The fertile soil and favourable climate support diverse farming practices, contributing to the local economy.

Livestock: Animal husbandry is a significant part of the local economy. Residents raise cattle, sheep, and goats, which provide meat, dairy products, and wool. This sector is vital for the livelihood of many families in the village.

Commercial establishments. It includes local shops where residents can purchase daily necessities such as food, beverages, and household items and open-air markets where fresh produce, livestock, and other goods are sold directly by local farmers and artisans. There are 2 private shops in the area.

Historical monuments. There are no historical monuments in the area.

Ulguj village

General Information. Ulguj is a village located in the Aghsu District of Azerbaijan. This village characterizes by its traditional lifestyle and close-knit community. The village is known for its agricultural practices and local customs, which play a central role in the daily lives of its residents.

The area of the village is 622 ha.

Geographical location. The village is positioned in a predominantly flat region, which is ideal for agriculture. The geographical setting includes fertile lands that support various farming activities.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 623, of which 51.4% are women. The distribution of the population by age is approximately as follows: 32% between 0-18 years old, 29% between 19-65 years old, and 39% over 65 years old. The number of people belonging to the vulnerable group is 0.6%. It includes 2 families of martyrs, 2 Karabakh war veterans and 2 physically disabled people..

Education. There is one complete secondary school.

Culture. There is one library in the village. There is one cemetery and one mosque in the village, and a place called "Ruined Town".

Healthcare. There is no medical center in the village.

Population employment. The population is engaged in agriculture and animal husbandry Also the village benefits from its proximity to nearby towns and industrial areas, where additional employment opportunities may be available for residents. Unemployment was raised as an issue by the community members.

Economy. Ulguj is connected to other towns and villages in the district, contributing to its accessibility and integration into the regional economy. The economy of Ulguj village is primarily based on agriculture and livestock. Key economic activities include:

Agriculture: The village engages in the cultivation of a variety of crops, including grains, vegetables, and fruits. The fertile soil and favourable climate conditions support productive farming practices.

Livestock: Animal husbandry is a significant aspect of the local economy. Residents raise cattle, sheep, and goats, providing meat, dairy products, and wool.

Commercial establishments. It includes local shops where residents can purchase daily necessities such as food, beverages, and household items and open-air markets where fresh produce, livestock, and other goods are sold directly by local farmers and artisans. There are 2 private shops in the area.

Historical monuments. There are no historical monuments in the area.

Garagoyunlu village

General Information. Garagoyunlu is a village located in the Aghsu District of Azerbaijan. It is a rural settlement known for its traditional lifestyle and community-focused living. The village's economy and daily life are closely tied to local agriculture and traditional practices, which play a central role in the community.

The area of the village is 4418 ha.

Geographical location. The village is positioned in a predominantly flat and fertile area, which is conducive to agricultural activities. The geographical setting includes expansive plains that support various types of farming. Garagoyunlu is well-connected to nearby towns and villages, which facilitates access to markets and other essential services.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 3938, of which 50.9% are women. The distribution of the population by age is approximately as follows: 18% between 0-18 years old, 72% between 19-65 years old, and 10% over 65 years old. The number of people belonging to the vulnerable group is 0.582%. It includes families (21) of martyrs (shahids), Karabakh war veterans, elderly population.

Education. There is one complete secondary school and one kindergarten.

Culture. There are 3 libraries and 1 cultural centre in the village. There is one cemetery and one mosque in the village.

Healthcare. There is one medical center (doctor and nurse) in the village.

Population employment. The population is engaged in agriculture and animal husbandry Also the village benefits from its proximity to nearby towns and industrial areas, where additional employment opportunities may be available for residents. Unemployment was raised as an issue by the community members.

Economy. The economy of Garagoyunlu village is primarily based on agriculture and livestock.

Commercial establishments. In Garagoyunlu village, the local commercial landscape typically includes grocery stores and small local markets: Ther is one shop in the village.

82 This is an approximate figure; the village representative mentioned 21 families but did not provide an exact number of people

Historical monuments. In the Garagoyunlu area there are historical and architectural monuments with red and white domes.

Dashdamirbayli village

General Information. Dashdamirbayli is a village located in the Aghsu District of Azerbaijan. It is a rural community known for its traditional way of life and close-knit social structure. The village's economy and cultural practices are deeply rooted in agriculture and local traditions.

The area of the village is 567 ha.

Geographical location. The village lies in a flat and fertile region, which is ideal for agricultural activities. The surrounding landscape includes expansive plains that support various types of farming. Dashdamirbayli is connected to other settlements in the district, providing access to trade and essential services.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1160, of which 49% are women. The distribution of the population by age is approximately as follows: 30% between 0-18 years old, 61% between 19-65 years old, and 9% over 65 years old. The number of people belonging to vulnerable groups is 1.3%. This group includes families of martyrs, disabled individuals, and veterans of the Second Karabakh War.

Education. There is one complete secondary school.

Culture. There is one library in the village. There is one graveyard in the village.

Healthcare. There is no medical center in the village.

Population employment. The population is engaged in agriculture, animal husbandry and beekeeping. Residents cultivate a variety of crops, such as grains, vegetables, and fruits. The fertile land supports productive farming practices. Many villagers raise livestock, including cattle, sheep, and goats, which provide meat, dairy products, and wool. Unemployment was raised as an issue by the community members.

Economy. The economy of Dashdamirbayli village primarily revolves around agriculture and livestock. People grow pomegranates, alfalfa, and grains in these fields. The households own land plots, being only 30 acres of land as they have sold the land parcels to a company for another project. The main source of income for the population is agricultural land.

Commercial establishments. In Dashdamirbayli village, the commercial establishments include Grocery Stores (mall shops where residents can buy everyday items like food, beverages, and household goods), Local Markets (open-air markets where fresh produce, meats, and other local products are sold) and

Service Providers (businesses offering essential services such as repair shops, tailoring, and other local services needed by residents). There are 2 shops in the village.

Historical monuments. There are no historical monuments in the area.

Gagali village

General Information. Gadali is a village located in the Aghsu District of Azerbaijan. It is a rural community with a traditional way of life, where agriculture and local customs play a central role. The village is known for its tight-knit community and reliance on local resources for daily living.

The area of the village is 7054 ha.

Geographical location. The village is positioned in a relatively flat and fertile area, which is advantageous for farming. The landscape includes expansive plains that support agricultural activities. Gadali's location offers connectivity to other towns and villages in the district, facilitating access to markets and services.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 4523, of which 49.6% are women. The distribution of the population by age is approximately as follows: 7.8% between 0-18 years old, 51.4% between 19-65 years old, and 10.8% over 65 years old. The number of people belonging to vulnerable groups is 9.15%. This group includes 1st group disabled persons, persons who lost their parents and need social assistance, people who are alone.

Education. There are two schools in the village: one complete secondary school and one incomplete secondary school.

Culture. There is one library and one house of culture in the village. There is one graveyard in the village. There is a martyrs' alley in the village.

Healthcare. There is one medical center in the village.

Population employment. The population is engaged in agriculture, animal husbandry and beekeeping. Residents cultivate a variety of crops, such as grains, vegetables, and fruits. The fertile land supports productive farming practices. Many villagers raise livestock, including cattle, sheep, and goats, which provide meat, dairy products, and wool. Unemployment was raised as an issue by the community members.

Economy. The economy of Gadali village is predominantly based on agriculture and livestock. People grow pomegranates, alfalfa, and grains in these fields. The households own land plots, being only 30 acres of land as they have sold the land parcels to a company for another project. The main source of income for the population is agricultural land.

Commercial establishments. There are 9 commercial centers, 2 teahouses, 2 barber shops in the village.

Historical monuments. Nargizava is an ancient settlement located in the Gadali area. This site is of historical and archaeological interest, reflecting the ancient human habitation and activities in the region. The settlement provides valuable insights into the past civilizations that once inhabited the area.

Bijo village

General Information. Bijo is a village located in the Aghsu District of Azerbaijan. Bijo is one of the ancient villages of Azerbaijan. Although its history has not yet been investigated properly, the obvious evidence informs us the ancient and rich culture of Bijo. The area of Bijo village is 5866 ha.

Geographical location. The village is located in a predominantly flat and fertile area, ideal for agricultural activities. The surrounding landscape includes extensive plains and potentially some low hills, providing a conducive environment for farming. Bijo is connected to other villages and towns in the district, facilitating access to markets and essential services.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 2151, of which 46.5% are women. The distribution of the population by age is approximately as follows: 17.8% between 0-18 years old, 78.4% between 19-65 years old, and 3.8% over 65 years old. The number of people belonging to vulnerable groups is 0.9%. This group includes alone and poor people.

Education. There are two schools in the village: one complete secondary school and one incomplete secondary school.

Culture. There are 1 cultural centre, 1 Post office and 1 PABX in the village. There are 2 graveyards and 2 mosques in the village. There is an ancient cemetery called “Rashidbulag” in Bijo village.

Healthcare. There is 1 medical point served by a doctor and 4 nurses.

Population employment. The population is engaged in animal husbandry, agriculture and carpet making. The proximity to other towns and industrial areas in the Aghsu District provides opportunities for residents to work in various sectors outside the village, including construction, manufacturing, and administrative roles. Unemployment was raised as an issue by the community members.

Economy. The economy of Bijo village is primarily based on agriculture and livestock. Overall, Bijo's economy is centered around traditional agricultural and livestock practices, with small businesses and crafts playing a role in supporting the local community.

Commercial establishments. There are 3 small shops in the village.

Historical monuments. There are no historical monuments in the area.

7.6.4. Ismayilli District

Sensitive receptors. Qubakhalilli defines disabled people as vulnerable. Only 1% of the village population meets this criteria. The village has a complete secondary school, a club, small shops and ATS. For health care, villagers go to the nearby village health centre. The village has a mosque and a cemetery.

Table 7.10. Social, cultural, and health receptors and health care data: Ismayilli district

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Gubakhalilli	2322	1138 (49%)	1184 (51%)	Disabled	24	1 school 1 club 4 markets 1 ASM	1 medical point	1 mosque 1 graveyard

Location map of the Project AoI settlements with most remarkable sensitive receptors is provided in the Figure below.

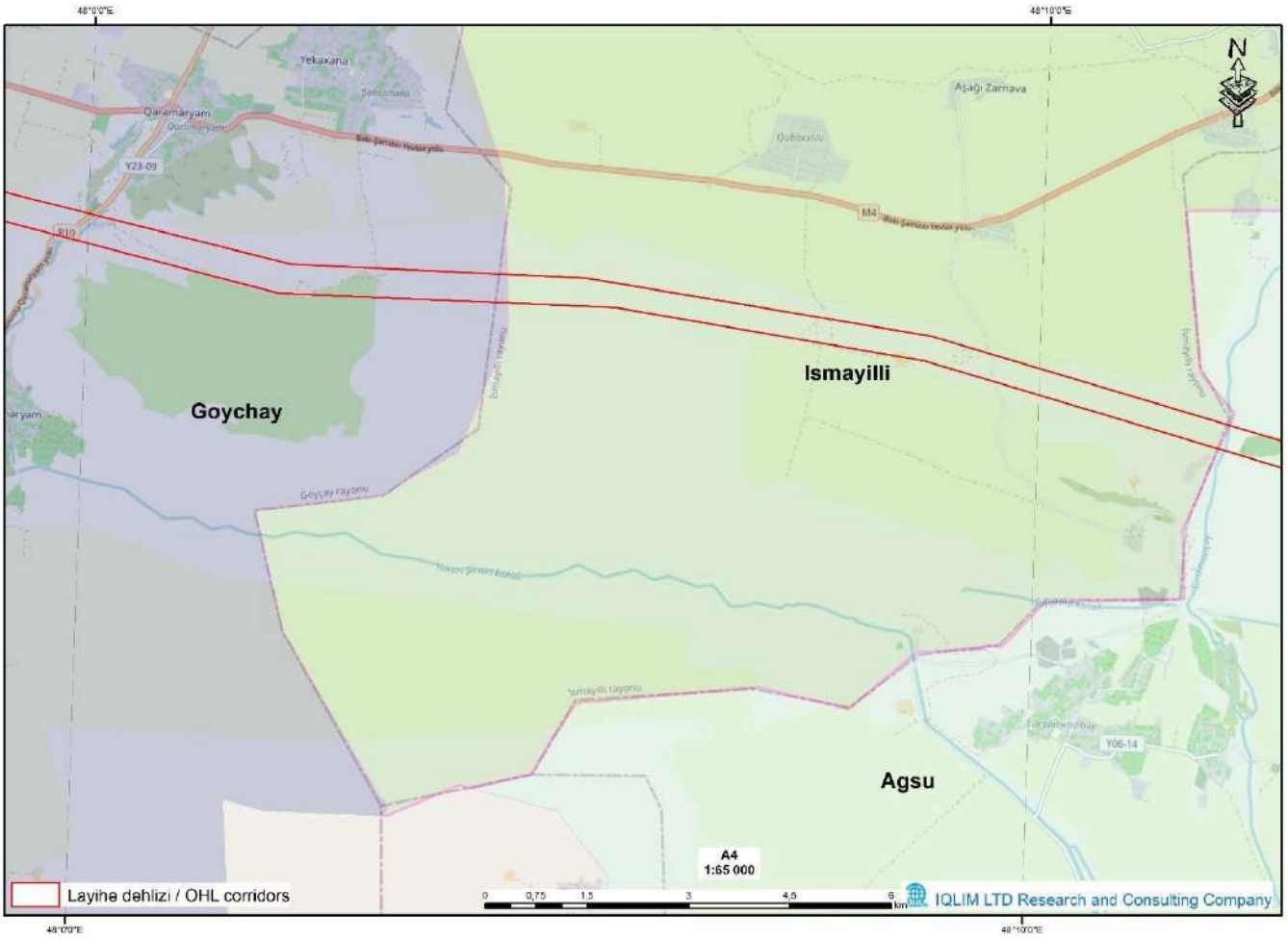


Figure 7.8: Project affected settlements and sensitive receptors: Ismayilli district

Ismayilli villages

Gubakhalilli village

General Information. Gubakhalili is a village and municipality in the Ismayilli District of Azerbaijan. It is a rural community characterized by its traditional lifestyle and rich cultural heritage. The village's residents are known for their hospitality and close-knit community ties. The name "Gubakhalilli" is derived from historical or local significance, reflecting the village's unique identity within the region. The area of Gubakhalili is 9529 ha.

Geographical location. Gubakhalili the village is located south of Ismayilli district. It is 37.3 km from Ismayilli district and 182 km west of Baku city. The village lies in a photosque area surrounded by natural

landscapes, including mountains and lush greenery. The region's topography includes hills and valleys, making it an attractive area for nature lovers and tourists. The village's location offers a blend of natural beauty and accessibility, with roads connecting it to nearby towns and the district center.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 2322, of which 49% are men. The distribution of the population by age is approximately as follows: 25% between 0-18 years old, 65% between 19-65 years old, and 10% over 65 years old. The number of vulnerable people in the village is 1%. It includes low-income and sick people.

Education. There is one general secondary school in the village.

Culture. There is one club in the village. In the village, there are two important religious and cultural sites for the community: one cemetery and one mosque.

Healthcare. There is one FHC (Family Health Center) in the village.

Population employment. The population is engaged in agriculture and animal husbandry. Unemployment was raised as an issue by the community members.

Economy. The economy of Gubakhalilli village is predominantly based on agriculture (the village is known for producing high-quality agricultural products, which are often sold in local markets) and animal husbandry (residents raise cattle, sheep, and goats, providing meat, dairy products, and wool, that is why this sector is a vital source of income for many households).

Commercial establishments. There are 4 commercial establishments in the area serving the population.

Historical monuments. In Gubakhalilli village, monuments have been erected in honor of the martyrs who lost their lives during the First Karabakh War and the Patriotic War (Second Karabakh War). These monuments serve as important symbols of remembrance and respect for those who sacrificed their lives for the nation's sovereignty and territorial integrity. In Gubakhalilli, approximately 2 km southwest of the village, on the right bank of the Girdimanchay, there is an ancient cemetery. Various items and tools were discovered during archaeological research conducted at this site.

7.6.5. Goychay District

Summary of sensitive receptors

In Goychay, 6% of the Garabaghal village population are considered vulnerable due to their low social status and disability. In the other villages of Mirzahuseynli, Arabchabirli 1, Arabchabirly 2 and Gharameryem, families of martyrs and veterans of the first and second Garabagh wars are considered vulnerable. In addition, including the number of families (30-40) living in poverty, 10% of Mirzahuseyinli village is considered vulnerable. In Arabchabirli 1 village, including 250 people living in poverty, 7.3% of

the population is vulnerable. In Arabchabirli 2 village, 11% of the population who are families of martyrs and veterans are highly vulnerable. In Gharamaryam, in addition to families of martyrs and veterans, the elderly and people with disabilities are considered vulnerable.

The most populated village of Garabaghal Region has a complete secondary school, a kindergarten, a house of culture and a number of other socio-economic points, including a post office. A medical point served by a doctor operates in the village. In the village of Arabchabili 1, despite being the second most populated village (3,384), there are no social receptors and health care services provided within the village area. The villagers travel to the town of Goychay, 1 km from the village, for medical and educational services.

In the sparsely populated village of the Region crossed by the Azure Project - Mirzahuseyinli, 1 incomplete secondary school and 1 kindergarten operate, a medical point staffed by a nurse provides medical services to the population. There is an old cemetery in Gabaghal and an old mosque "Fatmai Zehra" in Garamaryam villages.

Table 7.11. Social, cultural, and health receptors: Goychay district

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Garabaggal	4700	2350 (50.7 %)	2350 (50%)	Poverty Disabled	280	1 school 1 kindergarten 1 club 2 restaurants 12 canteens 1 bazar 8 markets	1 medical point	1 mosque 1 ancient graveyard
Mirzahuseynli	959	385 (40%)	574 (60%)	Poverty Martyr families Veterans	100	1 school 1 kindergarten 1 market	1 medical point	1 mosque 1 graveyard
Arabjabirli 1	3384	1354 (40%)	2030 (60%)	Poverty Martyr families Veterans	250	Facilities in Goychay	Facilities in Goychay	1 graveyard
Arabjabirli 2	1340	536 (40%)	804 (60%)	Poverty Disabled Martyr families	150	1 school 1 library Wedding palace	1	1 mosque 1 graveyard

				Veterans		2 markets		
Garamaryam	7300	4015 (55%)	3285 (45%)		Not provided	1 school 1 kindergarten 1 club 2 libraries	1 medical point 1 maternity point 1 pharmacy	1 mosque 1 graveyard

Location map of the Project AoI settlements with most remarkable sensitive receptors is provided in the Figure below.

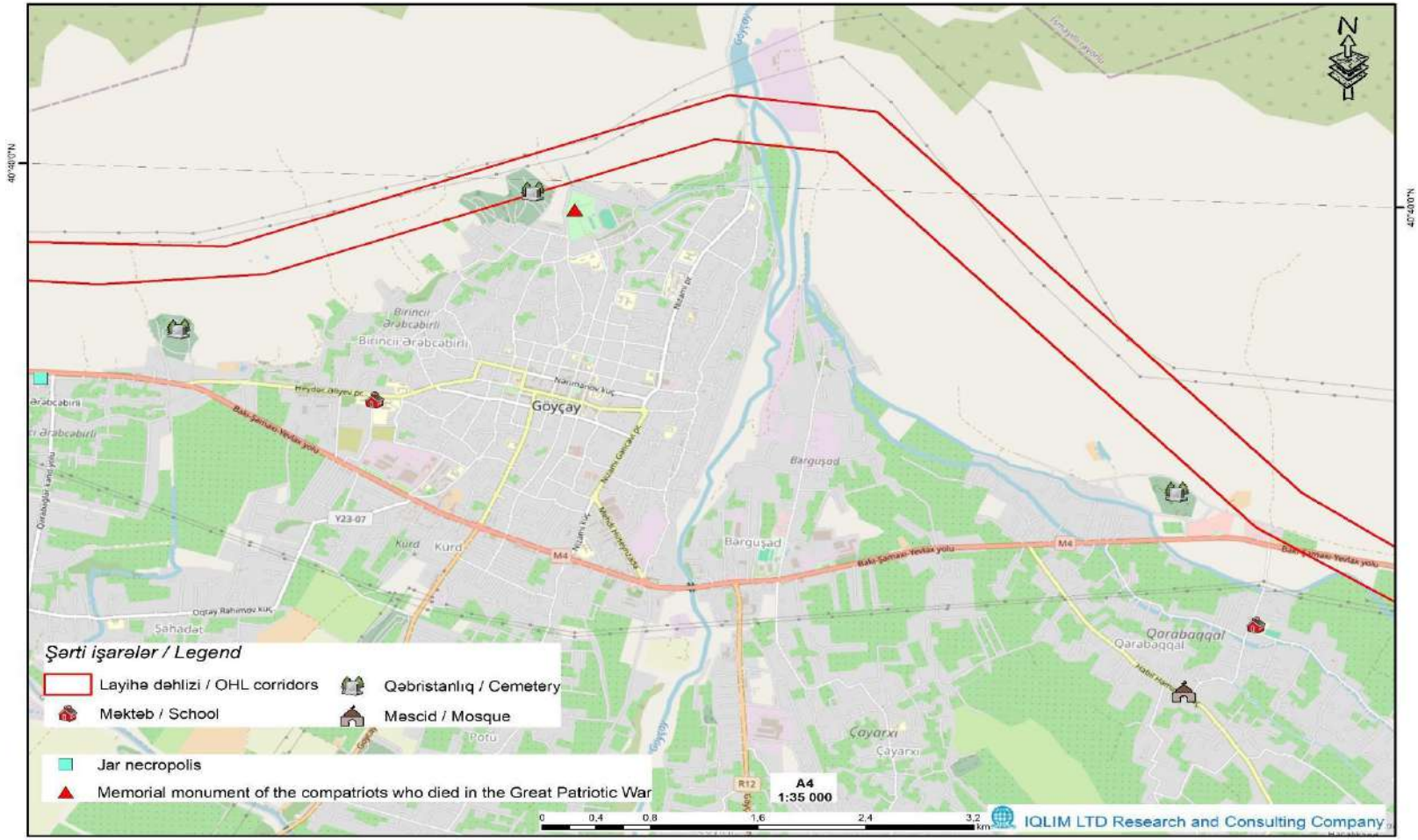


Figure 7.9: Project affected settlements and sensitive receptors: Goychay district

Goychay villages

Arabjabirli I (Birinji Arabjabirli) village

General Information. Birinji Arabjabirli is a village and municipality in the Goychay District of Azerbaijan.

The area of Birinji Arabjabirli is 754 ha.

Geographical location. Birinji Arabjabirli village is 5 km west of the district center and 218 km of Baku city. Birinji Arabjabirli is located in a region characterized by a mix of flat and gently rolling terrain. The climate is continental, with hot summers and cold winters, making it suitable for agriculture.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 3384, of which 40% are men. The distribution of the population by age is approximately as follows: 35% between 0-18 years old, 47% between 19-65 years old, and 18% over 65 years old. The number of vulnerable people in the village is 7.3%. It includes families of shahids, warriors and people who live in poverty.

Education. Since it is located near the city of Goychay (0.5-1 km from the center), the population studies in central schools.

Culture. In the village, there is one cemetery.

Healthcare. Since it is located close to the city of Goychay, residents turn to the center's medical institutions if necessary.

Population employment. The population is engaged in animal husbandry, grain growing, gardening. Unemployment was raised as an issue by the community members.

Economy. Birinji Arabjabirli village in the Goychay District, like many rural areas in the region, primarily relies on agriculture and small-scale farming.

Goychay District is renowned for its high-quality pomegranates, and Arabjabirli village likely contributes to this reputation. Pomegranate farming is a significant part of the local economy, with various pomegranate varieties cultivated for both local consumption and export.

Commercial establishments. There are 6 commercial establishments in the area serving the population.

Historical monuments. There are no historical monuments in the area.

Arabjabirli II (Ikinji Arabjabirli) village

General Information. Ikinji Arabjabirli is a village and municipality in the Goychay District of Azerbaijan. Ikinji Arabjabirli is a rural village with a population primarily consisting of local Azerbaijani ethnic groups. The community is traditionally involved in agriculture and related activities.

The area of Ikinji Arabjabirli is 1380 ha.

Geographical location. Ikinji Arabjabirli village is 6 km west of the district center and 219 km of Baku city. The village is located in a predominantly flat to gently rolling landscape. The region experiences a continental climate with hot summers and cold winters, which influences agricultural activities.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1340, of which 40% are men. The distribution of the population by age is approximately as follows: 32% between 0-18 years old, 53% between 19-65 years old, and 15% over 65 years old. The number of vulnerable people in the village is 11%. It includes families of shahids, warriors, sick people.

Education. There is one secondary school incomplete.

Culture. There is one a library in the village. There are one mosque and one cemetery.

Healthcare. There is one first-aid station (1 doctor, 2 nurses).

Population employment. The population is engaged in livestock, arable farming, cotton farming, silkworm breeding, gardening. Unemployment was raised as an issue by the community members.

Economy. Ikinji Arabjabirli village primarily relies on agriculture and small-scale farming.

Commercial establishments. There are 3 small shops, 1 Wedding place in the village.

Historical monuments. There are no historical monuments in the area.

Garabaggal village

General Information. Garabaggal is a village and municipality in the Goychay District of Azerbaijan.

The area of Garabaggal is 5000 ha.

Geographical location. Garabaggal village is 7.7 km in southeast of the district center and 212 km of Baku city.

The area around Garabaggal features a mix of flat and gently rolling terrain, which is conducive to agriculture. The region benefits from the fertile soil and suitable climate for growing various crops. Garabaggal is relatively close to the district center, Goychay, which provides access to local administrative services, markets, and infrastructure.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 4700, of which 50% are men. The distribution of the population by age is approximately as follows: 27% between 0-18 years old,

65.1% between 19-65 years old, and 7.9% over 65 years old. The number of vulnerable people in the village is 6%. It includes persons with low social status and sick people.

Education. There is one secondary school and one kindergarten.

Culture. There are one a library and 1 post office in the village. There are one mosque and one cemetery here.

Healthcare. There is one first-aid station (1 doctor).

Population employment. The population is engaged in gardening (pomegranate), arable farming, vegeculture. Unemployment was raised as an issue by the community members.

Economy. Garabaggal, a village in Goychay District, Azerbaijan, primarily relies on agriculture as its economic backbone. The region is known for its fertile soil and favourable climate, which support the cultivation of a variety of crops.

Commercial establishments. There are 8 shops, 1 cattle market, 1 car market and restaurants (2 big, 12 small) in the area serving the population.

Historical monuments. There are no historical monuments in the area.

Mirzahuseynli village

General Information. Mirzahuseynli is a village in the Goychay District of Azerbaijan.

The area of Mirzahuseynli is 887 ha.

Geographical location. Mirzahuseynli village is 7.6 km west of the district center and 223 km of Baku city. The village benefits from the region's moderate climate, which is conducive to agriculture. It is situated relatively close to the district center, Goychay, which provides access to larger markets and administrative services.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 959, of which 40% are men. The distribution of the population by age is approximately as follows: 30% between 0-18 years old, 54% between 19-65 years old, and 16% over 65 years old. The number of vulnerable people in the village is 10%. It includes families of shahids and warriors.

Education. There is one secondary school incomplete (9 grades) and one kindergarten.

Culture. There are 1 library and 1 post office in the village. There are one mosque and one cemetery here.

Healthcare. There is one first-aid station (1 nurse).

Population employment. The population is engaged in agriculture, animal husbandry. Unemployment was raised as an issue by the community members.

Economy. The economy of Mirzahuseynli is predominantly agricultural, reflecting the broader economic pattern of the Goychay District. The fertile soil and favourable climate in Mirzahuseynli support the cultivation of various crops. Commonly grown crops include grains such as wheat and barley, as well as fruits and vegetables. Some residents engage in livestock farming, raising animals such as cattle, sheep, and goats. This provides additional income and is an important part of the local diet. In addition to agriculture, there may be small-scale local businesses and craft enterprises that contribute to the village's economy.

Commercial establishments. There are 8 shops, 1 cattle market, 1 car market and restaurants (2 big, 12 small) in the area serving the population.

Historical monuments. There are no historical monuments in the area.

Garamaryam village

General Information. Garamaryam is a village in the Goychay District of Azerbaijan. The area of Garamaryam is 4000 ha.

Geographical location. Garamaryam village is 25.9 km east of the district center and 191 km of Baku city. The village is situated in a predominantly agricultural region with a mix of flatlands and gentle hills. The climate is typically continental, with warm summers and cold winters, which influences local agriculture.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 7300, of which 55% are men. The distribution of the population by age is approximately as follows: 15% between 0-18 years old, 65% between 19-65 years old, and 20% over 65 years old. The number of vulnerable people in the village is 5%. It includes families of shahids and warriors, elderly and disabled people.

Education. There is one secondary school and one kindergarten.

Culture. There is 1 club, 2 libraries, 1 department of communication, 1 electronic PABX. The religious community of the "Fatimeyi Zahra" Mosque is active in the village. There are two cemeteries in the village.

Healthcare. There are 1 hospital and maternity home, 2 pharmacies.

Population employment. The population is engaged in agriculture, arable farming, livestock. Unemployment was raised as an issue by the community members.

Economy. The economy of Garamaryam village is largely driven by agriculture. Economic activities here are closely tied to agricultural seasons and market conditions, with residents adapting their practices based on factors like weather patterns and crop prices.

Commercial establishments. There are many small shops, catering facilities in the area serving the population.

Historical monuments. There are ancient tombstones (last century) in the area.

7.6.6. Aghdash District

Summary of sensitive receptors

Families of martyrs and veterans, people with disabilities are the main criteria of vulnerability in the villages. In the villages of Yukhari Agjayaz and Goshagovag these people make up 4.5% and 16% respectively. In Arabojaghi village, the criteria is extended by single elderly women, making the total vulnerable population up to 15.7%. In the village of Hushun, in addition to martyr families and people with disabilities, people with low incomes are also included, making a total of 4.7% of the population vulnerable.

Each village in the Aghdash Region crossed by the Azure Project has a complete secondary school. In Yuxari Agjayaz and Goshagovag villages, there is also a house of culture (in each village). Libraries in Yuxari Agjayaz and Hushun villages and a kindergarten in Arabojaghi village are also among the social reseptors of the villages. Health services are provided in each village mainly in the medical points by at least one nurse. In Yuxari Agjayaz village there are two health centres and 3 nurses. In Hushun village there is one family health centre with two nurses. Each village has a cemetery, and Hushun and Arabojaghi villages each have a mosque. There is a holy place called "Arab" in the area of Arabojaghi village.

Table 7.12. Social, cultural, and health receptors: Aghdash district

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Yukhari Agjayaz	1334	533 (40%)	801 (60%)	Martyr families Disabled	60	1 school 1 club 2 libraries 4 markets	2 medical points	1 graveyard
Goshagovag	1305	652 (49.9 %)	653 (50.1%)	Disabled Martyr families Veterans	209	1 school 1 club 1 library 3 markets	1 medical point	1 graveyard

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Arabojaghi	950	400 (42.2 %)	550 (57.8%)	IDPs Single women Martyr families Veterans	200	1 school 1 kindergarten 2 markets	1 medical point	1 mosque 1 graveyard 1 sacred place
Hushun	1230	595 (48.5 %)	633 (51.5%)	Poverty Disabled Martyr families Veterans	58	1 school 1 library 2 markets 1 teahouse 1 restaurant	1	1 mosque 1 graveyard 1 ancient graves place

Location map of the Project AoI settlements with most remarkable sensitive receptors is provided in the Figure below.

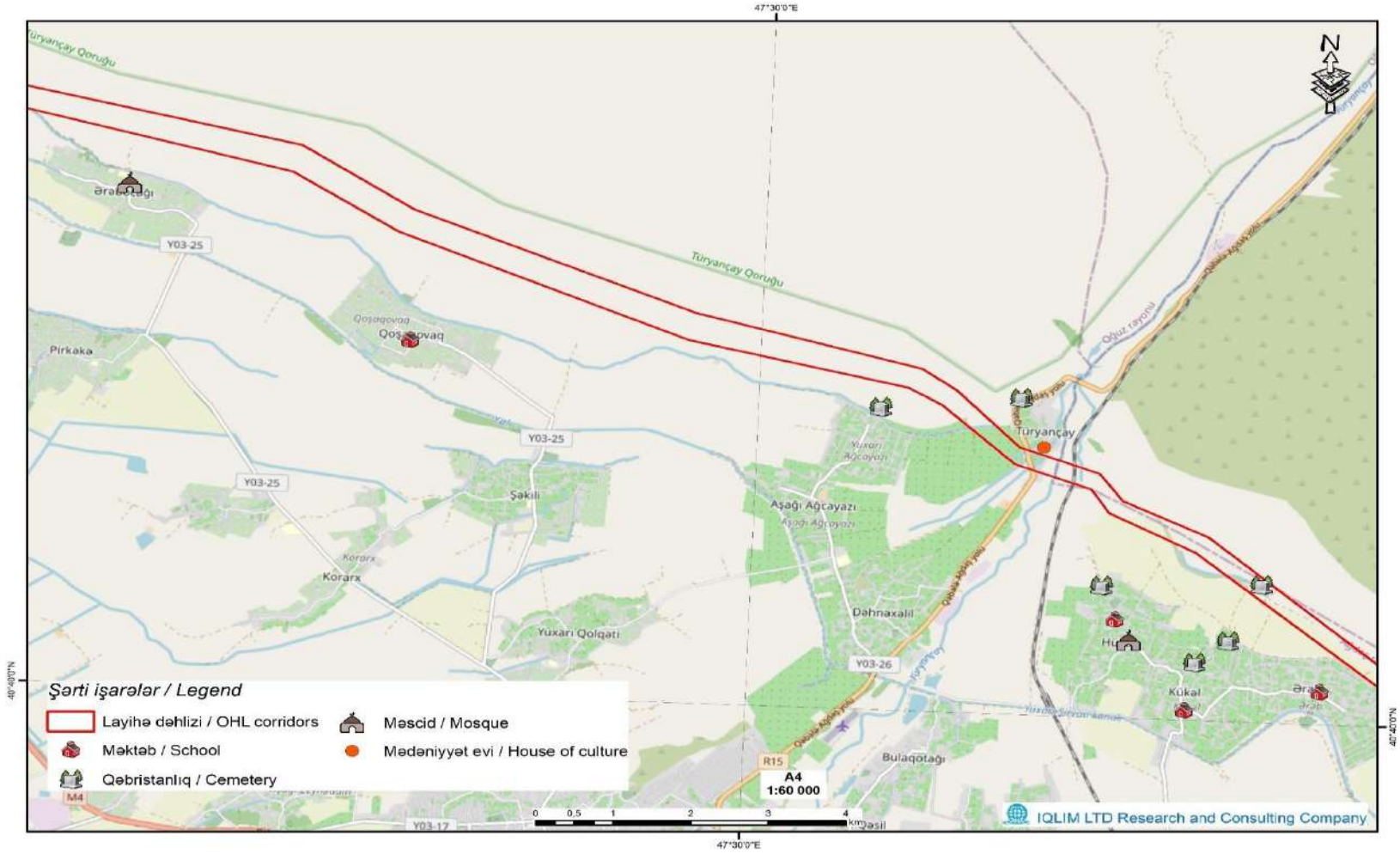


Figure 7.10: Project affected settlements and sensitive receptors: Aghdash district

Aghdash villages

Yukhari Aghjayazi village

General Information. Yukhari Aghjayazi is a village and municipality in the Aghdash District of Azerbaijan.

The area of Yukhari Aghjayazi is 730 ha. Yukhari Aghjayazi is a rural settlement with a predominantly Azerbaijani population. The village community is engaged in traditional agricultural practices and maintains a rural lifestyle.

Geographical location. The Upper Shirvan Canal flows near the village.

The village is located 12 km from the regional center of Aghdash and 250 km from Baku. The nearest railway station is Laki.

The village is 88 m above sea level. The average annual air temperature in the village is +14.8 °C. The village has a semi-arid climate.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1334, of which 40% are men. The distribution of the population by age is approximately as follows: 42% between 0-18 years old, 36% between 19-65 years old, and 22% over 65 years old. The number of vulnerable people in the village is 4.5%. It includes families of shahids, disabled people.

Education. There is one secondary school.

Culture. There is one club and two libraries. There is one cemetery in the village.

Healthcare. There are 2 first-aid station (3 nursues).

Population employment. The population is engaged in agriculture, animal husbandry and fruit and vegetable farming. Unemployment was raised as an issue by the community members.

Economy. The economy of Yukhari Aghjayazi is largely based on agriculture, gardening and livestock farming. The village produces a variety of crops, including grains like wheat and barley, as well as legumes and other vegetables. The region is known for growing fruits such as grapes, apples, and pomegranates.

Commercial establishments. There are 4 small shops in the area serving the population.

Historical monuments. There are no historical monuments in the area.

Arabojaghi village

General Information. Arabojaghi is a village in the Aghdash District of Azerbaijan. The area of Arabojaghi is 2200 ha. Arabojaghi is a rural village with a primarily Azerbaijani population. The community is traditionally engaged in agriculture and related activities.

Geographical location. Arabojagi is located on the bank of the Upper Shirvan Canal.

The village is located 4 km from the center of the municipality of Pirkekya, 13 km from the regional center of Aghdash and 251 km from Baku. The nearest railway station is Laki.

The village is located at an altitude of 85 meters above sea level. The average annual air temperature in the village is +14.9 °C. The village has a semi-arid climate.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 950, of which 42.2% are men. The distribution of the population by age is approximately as follows: 21.05% between 0-18 years old, 63.15% between 19-65 years old, and 15.8% over 65 years old. The number of vulnerable people in the village is 15.7%. It includes IDPs, families of shahids and warriors, lonely people, veterans.

Education. There are one secondary school and one kindergarten.

Culture. There is one a library. There are two mosques and one cemetery in the village.

Healthcare. There are hospital and ambulatory.

Population employment. The population is engaged gardening arable farming, seed industry. Unemployment was raised as an issue by the community members.

Economy. The village's economy is predominantly based on agriculture, gardening and livestock farming. Major crops in the area include grains such as wheat and barley, as well as various vegetables and legumes. The village grows a range of fruits like grapes, apples, and pomegranates. Many residents also raise livestock, including cattle, sheep, and goats, contributing to the local economy and food supply.

Commercial establishments. There are 2 shops, 2 catering establishments in the area serving the population.

Historical monuments. There is a pir (sacred site) named Arabocaghı in the area.

Goshagovag village

General Information. Goshagovag is a settlement and municipality in the Aghdash District of Azerbaijan. The name of the village comes from the word "govag" (poplar). According to local residents, at the time of the village's foundation, there were two large poplars near it.

The area of Goshagovag is 1180 ha.

Geographical location. Goshagovag is located on the bank of the Upper Shirvan Canal and near the Turianchai River. The village is located 10 km from the regional center of Aghdash and 243 km from Baku. The nearest railway station is Laki. The village is located at an altitude of 86 meters above sea level. The average annual air temperature in the village is +14.9 °C. The village has a semi-arid climate.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1305, of which 49.9% are men. The distribution of the population by age is approximately as follows: 20% between 0-18 years old, 66.2% between 19-65 years old, and 13.8% over 65 years old. The number of vulnerable people in the village is 16%. It includes disabled, war participants and families of shahids.

Education. There is one secondary school.

Culture. There are one a library and 1 cultural centre in the village. There are one mosque and one cemetery.

Healthcare. There is one first-aid station (1 nurse).

Population employment. During the Soviet era, the population was engaged in cotton growing, silkworm breeding, livestock breeding and grain cultivation. Now the population is mainly engaged in grain cultivation, fruit and vegetable farming. Unemployment was raised as an issue by the community members.

Economy. Goshagovag is a rural village with a population primarily consisting of Azerbaijanis. The community is involved in traditional agricultural practices, gardening and livestock farming and local industries.

Commercial establishments. There are 3 shops (including OBA market) in the area serving the population.

Historical monuments. The monument to the participants of the Great Patriotic War is erected in the center of the village.

Hushun village

General Information. Hushun is a village in the Aghdash District of Azerbaijan. The name of the village comes from the Mongolian word “khoshun” (estate, possession).

The area of Hushun is 708 ha.

Geographical location. Hushun village is located on the bank of the Turianchay River, and the Upper Shirvan Canal flows nearby..

The village is located 1 km from the center of the municipality of Kukel, 14 km from the regional center of Aghdash and 231 km from Baku. The nearest railway station is Laki.

The village is located at an altitude of 79 meters above sea level.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1230, of which 48.5% are men. The distribution of the population by age is approximately as follows: 24.4% between 0-18 years old, 67.55% between 19-65 years old, and 8.05% over 65 years old. The number of vulnerable people in the village is 4.7%. It includes families of shahids, disabled and persons with low social status.

Education. There is one secondary school incomplete.

Culture. There is one a library. In the village, there is one mosque and one cemetery.

Healthcare. There is 1 first-aid station of Family Healthcare Center with 2 nurses.

Population employment. The population is engaged in gardening, fruit and vegetable farming. Unemployment was raised as an issue by the community members.

Economy. The village's economy is largely driven by agriculture.

Commercial establishments. There are 2 shops, 1 teahouse, 1 cafe in the area serving the population.

Historical monuments. There are no historical monuments in the area, except an old cemetery in the village.

7.6.7. Yevlakh District

Summary of sensitive receptors

Similarly to the villages of the districts mentioned above, in the Yevlakh villages traversed by the Azure Project, the most cited criterion for vulnerability is belonging to martyr and veteran families/veterans. Thus, in the villages of Arash, Gulovsha, Havarli, Hurushaghi and Yukhari buchaq the vulnerable population is defined only by this criterion and constitute 4.7%, 1.9%, 1.8%, 2.5% and 3% of the people in the villages respectively. In the villages of Aksham, Hachiselli and Tanrigulular, people with low income are considered as a second criterion of vulnerability and together with the families of martyrs and veterans constitute 2.4%, 4.3% and 6% of the population in their respective villages. Additional criteria of disability and orphanhood constitute the vulnerability of Salahli village (3%), while in Boshchali village the only criterion of vulnerability is low social status, people living in poor conditions and with low income, which constitute 4% of the village population.

Except for the villages of Yuxari buchag and Boshchali, all villages in the Yevlakh Region crossed by the Azure Project have a complete secondary school. The villagers of Boshchali go to the school in the neighbouring village of Gul. The village of Yuxari buchag has only an incomplete secondary school. In the

most populous village of Yevlakh Region, Arash, there is also a club, a folk house, a post office and other small shops. In the villages of Axsham, Havarli and Tanrigulululular, in addition to the social receptors mentioned above, there are also functioning libraries. In Arash village, there is a primary school, an incomplete and a complete school, two libraries, a community centre and a club. There are ATS (Automatic Telephone Stations) operating in Gulovsha, Hacisell, Salahlo, Hurushagi and Tanrigulululular villages. Most of the villages do not have medical centres for health services and people go to nearby villages or towns. For example, the residents of Arash, Akhsham and Haciselli villages go to Khaldan settlement, which is 3-13 km away from the villages. Residents of Salahli village go to Balchili village (1 km away) and some go to Aran Family Health Centre, which is 6 km away from the village. Residents of Boshchali, Huruushahgi and Tanrigulululular villages go to Aran Region and Mingachevir town medical services at a distance of 6-17 km from the villages. One medical point operate in each village of Haciselli and Yuxari buchag, employed by 4 and 2 nurses respectively. Each village has cemeteries in the territory; in the territory of Yuxari buchag village there is also an old German and Russian cemetery. Except Salahli, Tanrigulululular and Boshchali villages, all other villages also have mosques in the area.

Table 7.13. Social cultural, and health receptors: Yevlakh district

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Arash	2515	1337 (53%)	1178 (47%)	Martyr families Disabled	120	2 schools 1 folk house 2 libraries 1 club 2 markets		1 mosque 2 graveyards 1 ancient gravery
Gulovsha	1264	687 (54.4%)	577 (50.1%)	Poverty Disabled Martyr families Veterans	30	1 school 1 library 2 markets		1 mosque 1 graveyard
Aksham	1766	916 (51.9%)	850 (48.1%)	Martyr families Veterans	35	1 school 3 markets		1 mosque 1 graveyard
Havarli	2900	1750 (60%)	1150 (40%)	Martyr families Veterans	50	1 school 1 library 6 markets 1 teahouse 1 restaurant	1 medical point	1 mosque 1 graveyard
Hajiselli	1054	454 (43%)	600 (57%)	Poverty Martyr families Veterans	45	1 school 1 market		1 mosque 1 graveyard
Salahli	3200	1632 (51%)	1568 (49%)	Poverty Disabled Martyr families Veterans	66	1 school 1 club 1 folk center 6 markets 6 merchandiser		2 graveyards
Huruushaghi	851	420 (49.4%)	431 (50.6%)	Veterans	50	1 school 2 markets		1 graveyard 1 historical site
Tanrigulular	2985	1501 (50.3%)	1484 (49.7%)	Poverty Disabled	180	1 school 2 libraries		1 graveyard

Village	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
				Martyr families Veterans		1 club 7 markets		
Boshchali	245	111 (45.3%)	134 (54.7%)	Poverty	10	1 school		
Yukhari Bujag	914	460 (50.3%)	454 (49.7%)	Martyr families Veterans	20	1 school 3 markets	1 medical point	3 mosques 3 active graveyards 1 german graveyard 1 russian graveyard

Location map of the Project AoI settlements with most remarkable sensitive receptors is provided in the Figure below.

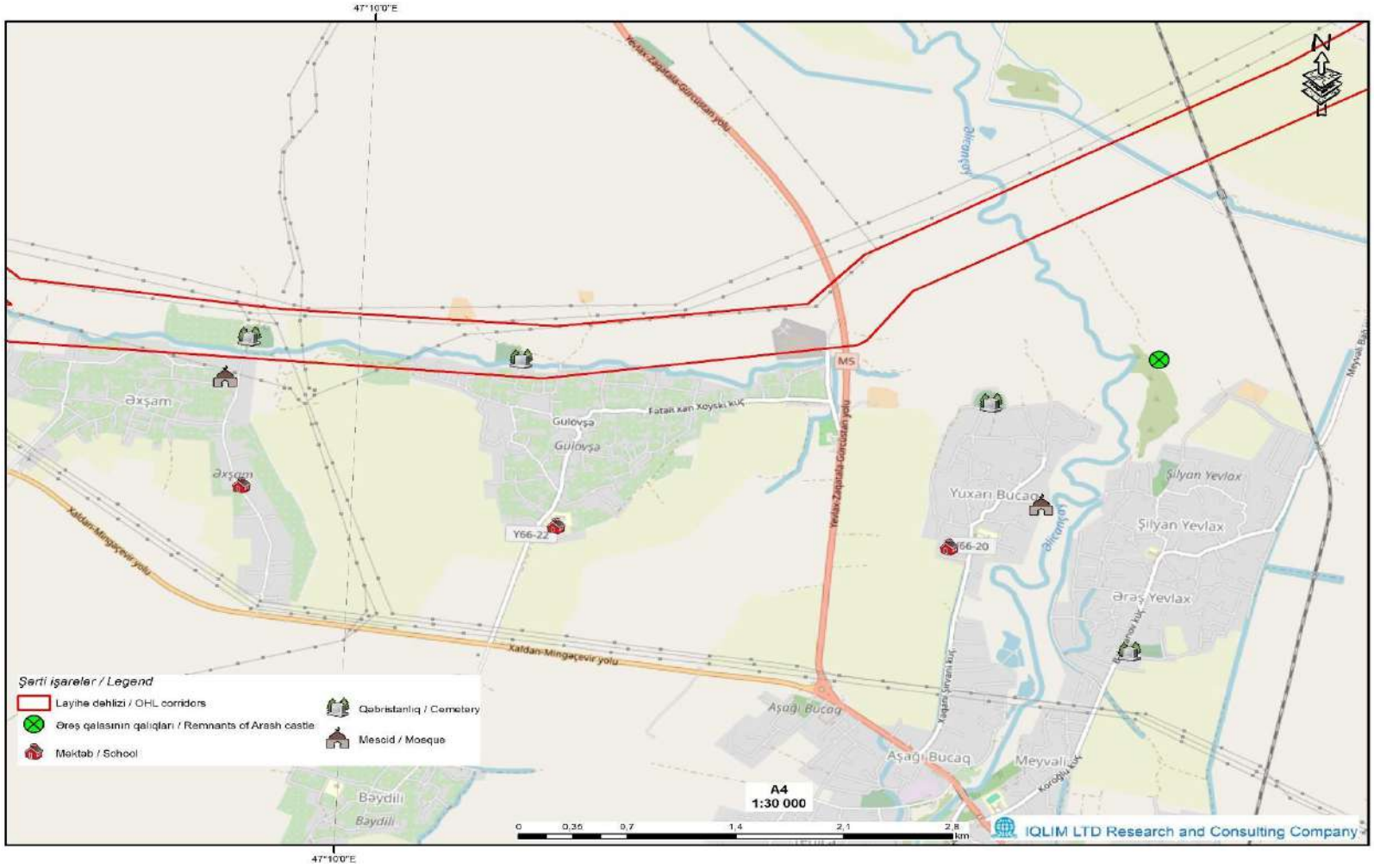


Figure 7.11: Project affected settlements and sensitive receptors: Yevlakh district and Mingachevir

Yevlakh villages

Arash village

General Information. Arash is a village and municipality in the Yevlakh District of Azerbaijan. The area of Arash is 1740 ha.

Geographical location. Arash village is located in a flat to gently rolling area. The region typically experiences a semi-arid climate, characterized by hot summers and mild winters.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 2515, of which 47% are men. The distribution of the population by age is approximately as follows: 39% between 0-18 years old, 53.05% between 19-65 years old, and 7.95% over 65 years old. The number of vulnerable people in the village is 4.8%. It includes families of shahids and veterans, disabled people, and elderly people.

Education. There are 1 secondary school complete, 1 secondary school incomplete.

Culture. There are 2 libraries, 1 club, 1 Folklore house in the village. There are 2 Mosques, 2 cemeteries in the village.

Healthcare. No first-aid station. In case of need, they go to the nearby village of Khaldan.

Population employment. The population is engaged in gardening and livestock. Unemployment was raised as an issue by the community members.

Economy. Arash village in Yevlakh District is a typical rural community with an economy based on agriculture and livestock farming, reflecting the traditional lifestyle and cultural practices of the region.

Commercial establishments. There are 2 mini markets in the area serving the population.

Historical monuments. There are no historical monuments in the village.

Akhsham village

General Information. Akhsham is a village in the Yevlakh District of Azerbaijan. The village forms part of the municipality of Havarlı. The area of Akhsham is 647 ha.

Geographical location. Akhsham village is located in a predominantly flat to gently undulating area. The region experiences a continental climate with hot summers and cold winters.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1264, of which 45.7% are

men. The distribution of the population by age is approximately as follows: 15.8% between 0-18 years old, 77.9% between 19-65 years old, and 6.3% over 65 years old. The number of vulnerable people in the village is 2.4%. It includes low-income families, also families of shahids and veterans.

Education. There is 1 secondary school complete.

Culture. There is 1 library in the village. There are 1 mosque and 1 cemetery in the village.

Healthcare. No first-aid station. In case of need, they go to the nearby village of Khaldan.

Population employment. The population is engaged in farming and livestock. Unemployment was raised as an issue by the community members.

Economy. The village's economy is primarily based on agriculture. Akhsham village is known for growing various crops such as wheat, barley, and cotton. The fertile soil and suitable climate support these agricultural activities. The village produces a range of fruits and vegetables, including melons, tomatoes, and cucumbers, which are important for local consumption and market sale.

Commercial establishments. There are 2 shops in the area serving the population.

Historical monuments. There are no historical monuments in the village.

Gulovsha village

General Information. Gulovsha is a village and municipality in the Yevlakh District of Azerbaijan. The area of Gulovsha is 1415 ha.

Geographical location. Gulovsha village is situated in a predominantly flat to gently undulating landscape. The region experiences a semi-arid climate with hot summers and relatively mild winters.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1766, of which 51.9% are men. The distribution of the population by age is approximately as follows: 14.2% between 0-18 years old, 78.4% between 19-65 years old, and 7.4% over 65 years old. The number of vulnerable people in the village is 2%. It includes families of shahids and veterans.

Education. There is 1 secondary school complete.

Culture. There are 1 PABX and 1 post office in the village. There are 1 mosque and 1 cemetery in the village.

Healthcare. No first-aid station. In case of need, they go to the nearby village of Khaldan (Khaldan Family Healthcare Center).

Population employment. The population is engaged in gardening and livestock. Unemployment was raised as an issue by the community members.

Economy. The primary economic activity in Gulovsha is agriculture, supported by the region's fertile soil and favourable climate.

Commercial establishments. There are 2 small shops in the area serving the population.

Historical monuments. There are no historical monuments in the village.

Havarly village

General Information. Havarly is a village and municipality in the Yevlakh District of Azerbaijan. The village was named after the type of reed called "havar" that grows in the area.

The municipality consists of the villages of Havarly and Akhsham. The area of Havarly is 2200 ha.

Geographical location. Havarly village is located in a predominantly flat region with some gentle undulations. The climate is semi-arid with hot summers and relatively mild winters.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 2900, of which 60% are men. The distribution of the population by age is approximately as follows: 12.1% between 0-18 years old, 83.07% between 19-65 years old, and 4.83% over 65 years old. The number of vulnerable people in the village is 1.7%. It includes families of shahids and veterans, and people with low income..

Education. There is 1 secondary school complete.

Culture. There are 1 club and 1 library in the village. There are 2 cemeteries and 1 Mosque (ancient) in the village.

Healthcare. No first-aid station. In case of need, they go to the nearby village of Khaldan (Khaldan Family Healthcare Center).

Population employment. The population is engaged in livestock and individual farm Unemployment was raised as an issue by the community members.

Economy. The economy of Havarly village is primarily based on agriculture, and livestock farming which is well-suited to the region's climatic conditions. Villagers mainly grow grain and alfalfa, which is the main source of income.

Commercial establishments. There are 6 shops in the area serving the population.

Historical monuments. There are no historical monuments in the village.

Hajiselli village

General Information. Hajıselli is a village and municipality in the Yevlakh District of Azerbaijan. The area of Haciselli is 1400 ha.

Hajiselli is a rural village primarily inhabited by Azerbaijani ethnic groups. The population is engaged in traditional agricultural activities and maintains a rural lifestyle.

Geographical location. Hajiselli is situated in a predominantly flat region with some gently rolling terrain.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 1054, of which 43% are men. The distribution of the population by age is approximately as follows: 18% between 0-18 years old, 70.6% between 19-65 years old, and 11.4% over 65 years old. The number of vulnerable people in the village is 4.3%. It includes low-income families, families of shahids and people with low income.

Education. There is 1 secondary school complete.

Culture. There are 2 post offices and 1 PABX in the village. There are 1 cemetery and 1 Mosque in the village.

Healthcare. No first-aid station. In case of need, they go to the nearby village of Khaldan (Khaldan Family Healthcare Center, 13 km).

Population employment. The population is engaged in farming and livestock. Unemployment was raised as an issue by the community members.

Economy. The village's economy is largely based on agriculture, and livestock farming . Residents cultivate of staple crops such as wheat, barley, and cotton. These crops are suited to the region’s climate and soil conditions.

Commercial establishments. There is 1 shop in the area serving the population.

Historical monuments. There is Sheikh Hazra Sanctuary in the village, attributed to the 16th century.

Salahly village

General Information. Salahly is a village and municipality in the Yevlakh District of Azerbaijan. The area of Salahly is 2042 ha.

Geographical location. Salahly village is located in a relatively flat area with some gentle undulations. The region has a semi-arid climate, characterized by hot, dry summers and mild, relatively wet winters.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 3200, of which 51% are men. The distribution of the population by age is approximately as follows: 12.5% between 0-18 years old, 79.7% between 19-65 years old, and 7.8% over 65 years old. The number of vulnerable people in the village is 2%. It includes families of shahids and veterans, and people with low income.

Education. There is 1 secondary school complete.

Culture. There are 1 cultural centre (folklore), 1 post office 1 PABX in the village. There is 1 cemetery in the village.

Healthcare. No first-aid station. In case of need, they go to the nearby village of Balchili (1 km away) or Aran Family Healthcare (6 km).

Population employment. The population is engaged in gardening and livestock. Unemployment was raised as an issue by the community members.

Economy. The primary economic activity in Salahly is agriculture, and livestock farming.. The village benefits from the fertile plains of the Aran region, which supports a variety of agricultural activities. Villagers mainly grow grain and alfalfa, which is the main source of income.

Commercial establishments. There are 6 shops and 6 catering facilities in the village.

Historical monuments. There are no historical monuments in the village.

Huruushaghy village

General Information. Huruushaghy is a village and municipality in the Yevlakh District of Azerbaijan. The municipality consists of the villages of Huruushaghy and Boshchaly. The area of Huruushaghy is 982 ha.

Geographical location. Huruushaghy village is located in a predominantly flat region with some gentle undulations. The climate is typically semi-arid, characterized by hot summers and mild winters, which influences the local agricultural practices.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 851, of which 49.4% are men. The distribution of the population by age is approximately as follows: 27.4% between 0-18 years old, 57.6% between 19-65 years old, and 15% over 65 years old. The number of vulnerable people in the village is 2.5%. It includes low-income families, also families of shahids and veterans.

Education. There is 1 secondary school complete.

Culture. There are not libraries and clubs here. There is one cemetery in the village.

Healthcare. No first-aid station. If necessary, they go to Mingachevir (7 km) or Aran (11 km).

Population employment. The population is engaged in animal husbandry, farming. Unemployment was raised as an issue by the community members.

Economy. Huruushaghy village in the Yevlakh District is a typical rural settlement with an economy focused on agriculture and a lifestyle that reflects traditional Azerbaijani values and practices.

Commercial establishments. There are 6 shops and 6 catering facilities in the village.

Historical monuments. There are ancient (historical) stones in the graveyard area.

Tanrigulular village

General Information. Tanrıqulular is a village and municipality in the Yevlakh District of Azerbaijan. The area of Tanrigulular is 2576 ha.

Geographical location. Tanrigulular is situated in a flat, fertile region with a predominantly semi-arid climate. The area experiences hot summers and mild winters.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 2985, of which 50.2% are men. The distribution of the population by age is approximately as follows: 30.2% between 0-18 years old, 53.6% between 19-65 years old, and 16.2% over 65 years old. The number of vulnerable people in the village is 6%. It includes families with low-income, families of shahids and with poor social status.

Education. There is 1 secondary school complete.

Culture. There are 2 libraries, 1 club, 1 PABX, 1 post office in the village. There is 1 cemetery

here.

Healthcare. No first-aid station (it is closed). If necessary, they go to the nearby settlement of Aran or Mingachevir.

Population employment. The population is engaged in gardening and livestock. Unemployment was raised as an issue by the community members.

Economy. The village's economy is primarily based on agriculture, benefiting from the region's fertile soil.

Commercial establishments. There are 7 (also OBA market) shops, 1 catering facility and in the village.

Historical monuments. There are no historical monuments in the village.

Boshchaly village

General Information. Boshchaly is a village in the Yevlakh District of Azerbaijan. The village forms part of the municipality of Huruushaghy. The area of Boshchaly is 214 ha.

Geographical location. Boshchaly village is situated in a predominantly flat area with some gently rolling terrain. The climate in this region is semi-arid, characterized by hot summers and mild winters.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 245, of which 45.3% are men. The distribution of the population by age is approximately as follows: 26.1% between 0-18 years old, 62.88% between 19-65 years old, and 11.02% over 65 years old. The number of vulnerable people in the village is 4%. It includes families with persons with low social status.

Education. There are no schools in the village. Children go to the nearby village's school.

Culture. This is a small village and no clubs or libraries here.

Healthcare. No first-aid station People go to Mingaçevir (6 km) and ARAN (12 km).

Population employment. The population is engaged in animal husbandry and farming. Unemployment was raised as an issue by the community members.

Economy. The economy of Boshchaly is largely based on agriculture. The village grows staple crops such as wheat, barley, and cotton. There are a variety of fruits and vegetables, including melons, tomatoes, and cucumbers grows here.

Many residents engage in raising livestock, including cattle, sheep, and goats. Livestock farming provides additional income and supports local food supplies.

Commercial establishments. There are no shops here.

Historical monuments. There are no historical monuments in the village.

7.6.8. Mingachevir town

Table 7.14. Social, cultural, and health receptors: Mingachevir

Town	Population			Vulnerability		Social receptors	Healthcare facilities	Cultural sensitivities
	Total	Males	Females	Criteria	Persons			
Mingachevir	122261	58444 (47.8%)	63785 (52.2%)	Unemployed Disabled Single parent families Poverty	3996 3937 2127 1563	20 schools 22 kindergartens 1 university 4 colleges/art schools 13 libraries 10 clubs/museums 2812 markets 9 hotels		1 mosque 2 graveyards 1 ancient gravery

General information

Mingachevir is the fourth most populous city in Azerbaijan. The name of the city is associated with the name of the military leader and administrator of the Arab Caliphate, Mingichovr al-Farghani, who lived in the 9th century.

The area of Mingachevir town is 13953 ha.

Geographical location. It is located on both banks of the Kura River 17 km northwest of the Baku - Ganja - Tbilisi railway, with a branch from Mingachevir station to Mingachevir-city station. The distance from Mingachevir to Baku is 275 km.

Number and composition of the population (age and gender distribution, vulnerable groups). Based on information gathered from local municipality representatives, the population is 102.432 (in addition, 19,829 forced roots were settled), of which 47.8% are men. The distribution of the population by age is approximately as follows: 30.3% between 0-18 years old, 60.5% between 19-65 years old, and 9.2% over 65 years old. The number of vulnerable people in the city is 32%. It includes 3,996 unemployed individuals, 13,597 pensioners (of whom 7,533 are pensioners by age), 2,127 people due to loss of head of household, and 1,563 recipients of state social assistance.

Education. There are 20 secondary schools, 20 kindergartens, 1 university, 2 colleges (on tourism and medicine), 1 professional school, 3 music schools, 1 art school. Also, 1 Technical-Humanitarian Lyceum and Mingachevir City Lyceum with a Focus on Natural Sciences, Mathematics, and Humanitarian Sciences.

Culture. There are 13 libraries, 7 club, 3 museums, 14 parks. 2 mosques, 3 cemeteries, 2 cemeteries (1 Russian, 1 German) in Mingachevir City.

Healthcare. 2 FHC (Family Health Center), 3 hospitals, 4 polyclinics, 4 dental clinics.

Population employment. The population mainly works in the energy sector ("Azerbaijan" TPP and Mingachevir HPS) and textile industries (Mingachevir Industrial Park).

Economy. Mingachevir is a significant industrial hub in Azerbaijan. Key industries include:

- Hydroelectric Power: The Mingachevir Dam, built on the Kura River, is a major source of hydroelectric power for the country. The dam and power plant are central to the city's economy.
- Manufacturing: The city has a diverse manufacturing sector, including machinery, chemicals, textiles, and construction materials.
- Construction: With ongoing infrastructure development, including residential and commercial construction, the city's construction sector plays a vital role in its economy.

The fertile lands around Mingachevir support various agricultural activities:

- Crop Farming: The region produces a range of crops such as cotton, grains (wheat and barley), and vegetables.
- Fruit Cultivation: The climate and soil conditions are favourable for growing fruits, including grapes and melons.
- Livestock farming: producing meat, milk, and other products.

Commercial establishments. There are 2687 shops, 125 kiosks, 9 hotels in the city.

Historical monuments. Mingachevir also stands as a significant historical and cultural hub in Azerbaijan. One of the remarkable monuments in the area is the Mingachevir church complex. The Albanian church complex of the IV-VII centuries was discovered in 1946 during the construction of Mingachevir HPP. The church was built on the foundation of an ancient Zoroastrian temple.

Based on the material, construction, and compositional solution of the temples, which have a simple and ancient architectural style, historians note that their construction dates back to the VI century. Another ancient settlement is Sudagylan. The ruins of Albanian (Caucasian) Christian temples remain here. Archaeologists have uncovered residential structures dating from the 1st to 3rd centuries and from the 4th to 7th centuries. Excavations also revealed the ruins of two Christian temples, complete with variously shaped metal crosses found beneath one of them. Additionally, a jug containing Arab-minted coins from the 8th to 9th centuries was found, highlighting the area's rich history.

Sudagylan also features over 300 unique "jug burials" where individuals were buried in large vessels in fetal positions, surrounded by coins, metal ornaments, and weapons. The site also includes burials in log coffins and catacombs.

There are also "Mother language" (15 years ago), "Dove of peace" (57 years ago), "City of Light", "Lonely woman" and other monuments at the Mingachevir area.

Summary of sensitive receptors. In Mingachevir, the unemployed, disabled, single-parent families and people receiving targeted state social benefits are considered the most vulnerable category of citizens. They make up 9.5% of the population.

There are 20 complete secondary schools, 22 kindergartens, Mingachevir State University, two colleges, one vocational school, one music art school, one music school, 13 libraries, seven clubs, three museums and many other private enterprises, shops and hotels. Health care is provided by three hospitals, four polyclinics, two family health centres and two dental clinics in the town of Mingachevir. There are two mosques, five cemeteries, including one Russian and one German cemetery on the territory of Mingachevir.

7.7. Navahi to Alat substation

7.7.1. Hajigabul

For Rancbar, Pirsaat, Navahi, Atbulaq and Qizilburun Please see above Section 7.6 Navahi to Azerbaijan TPP.

7.7.2. Alat

General information. Alat settlement forms an Administrative Territorial Unit (Alat ATU) belonging to the administrative division of Garadagh district of Greater Baku. The ATU consists of Alat, Bash Alat and Kotal settlements. The largest of the settlements is Alat, and the smallest is Kotal. The total area of Alat ATU is 321 km2. It is located on the Baku-Tbilisi railway and the Baku-Astara highway. Briefing of their main socioeconomic parameters of the studied communities is provided in the Table below.

Table 7.15. General information on the local communities of Alat Administrative Territorial Unit

Indicators	Settlements		
	Alat	Bash Alat	Kotal
Population (people)	13862	2707	616
Distribution by age			

Indicators	Settlements		
	Alat	Bash Alat	Kotal
age group of 0-18	4297	839	191
age group of 19-65	8803	1719	391
age group of above 65	762	149	34
Distribution by gender			
Males	7070	1381	314
Females	6792	1326	302
Households (family)	2045	515	89
Education facilities	2	-	-
Kindergartens	2	-	-
Schools	3	1	-
Vocational training facilities	1	-	-
Clubs	2	-	-
Historical monuments	-	-	-
Mosques	1	-	-
Healthcare facilities	2	-	-
Trade facilities	56	2	1
Catering facilities	4	-	-

Demography. According to the information provided by Garadagh EA and local municipality, the total population of the studied settlements is 17,185 people (Alat - 13862, Bash Alat - 2707, Kotal - 616), and the number of households is 2649 (Alat – 2045, Bash Alat – 515, Kotal – 89).

Regarding the gender distribution of the local communities, it should be noted that the number of men is slightly higher than the number of women. Thus, females make up 48.9% of the population of Alat, 48.98% of the population of Bash Alat, and 49.02% of the population of Kotal.

4297 residents of Alat are under 18 years old, 8803 residents are 18-65 years old, and 762 residents are over 65. In Bash Alat, the number of underaged residents is 839 people, the number of 18-65 years old residents is 1719 people, and the number of residents over 65 is 149 people. In Kotal settlement, these numbers equal to 191 people, 391 people and 34 people respectively.

Most people living in the area are permanent registered residents of the respective settlements. According to the information of the State Committee for Refugees and Internally Displaced Persons of the Republic of Azerbaijan, 73 IDP families have been settled in Alat ATU, and all of them are planned to be relocated to Garabagh and Eastern Zangezur Economic Regions in the coming years.

7.8. Navahi to Absheron-Garadagh WPP

7.8.1. Hajigabul

For Rancbar, Pirsaat, Navahi, Atbulaq and Qizilburun Please see above Section 7.6 Navahi to Azerbaijan TPP.

7.8.2. Gobu (Qobu)

See Gobu within Absheron District.

7.8.3. Absheron district

7.8.3.1. Gobu settlement

General Information. Gobu is a village and municipality in the Absheron District of Azerbaijan. Although Gobu is one of the ancient settlements of Absheron, its history is little studied. The name of this settlement means "slope, valley with a temporary watercourse, plain". Gobu is surrounded by the Shuban Mountains. It is adjacent to the settlements of Lokbatan, Guzdek, Hokmali and Atyali. Gobu, the largest settlement, has an area of 3,835 ha.

Geographical location. Gobu settlement is situated in a predominantly flat region with some rolling areas. The climate of the settlement is semi-desert. The climate is generally mild with hot summers and relatively mild winters, typical of the Absheron Peninsula.

Number and composition of the population (age and gender distribution, vulnerable groups). Gobu has the population of 18,900. The population composition is 50.8% men and 49,2% women.

Education. The settlement has three complete secondary schools, two kindergartens.

Culture. The settlement has one cultural centre and one cemetery.

Healthcare. Medical services are provided by a polyclinic with three doctors and four nurses.

Population employment. The main economic activities of the local population are agriculture, animal husbandry and weaving.

Economy. Gobu has an economy based on agriculture, with a significant focus on greenhouse farming and livestock. Its proximity to Baku enhances its economic activities by providing access to larger markets and resources. Gobu carpet has always been known in Azerbaijan due to its variety and texture. Here, the carpet is woven with threads made of camel wool. Currently, the largest camel breeding farm in Azerbaijan is in Gobu. At present, part of the village population works in the oil industry in Garadagh region.

Commercial establishments. There are 30 different shops operating in the settlement.

Historical monuments. Healing water called "Pil-pila" springs near the Gobu cemetery. Gobu has a sacred site named "Forty Girls''. The rocks are arranged in such a way that it looks like forty people are lined up in a row.

Gobu has a bathhouse built in 1300 according to the Hijri Qamar calendar (1882 AD). The bathhouse was built by Mirza Abdullah. The bathhouse was built in the oriental architectural style. It is still unclear how the water was drained from this bath.

Atyali settlement

General Information. Atyali is a settlement in the Absheron District of Azerbaijan.

Geographical location. The settlement is situated on the Absheron Peninsula, which features a relatively flat landscape with some rolling hills. The area experiences a semi-arid climate with hot summers and mild winters.

Climate is similar to the one experienced across the Absheron Peninsula.

Number and composition of the population (age and gender distribution, vulnerable groups). Atyali has the population of 12,000.

Education. The settlement has complete secondary schools and kindergartens.

Population employment. The population is mainly engaged in animal husbandry.

Economy. The population mainly works in agriculture.

Other. For various socio-economic and health activities, residents of Atyali village go to the nearby settlements of Hokmeli, Mushviqabad or Gobu.

28 May settlement

General Information. 28 May is a settlement in the Absheron District of Azerbaijan.

Geographical location. The settlement is situated on the Absheron Peninsula, which features a relatively flat landscape with some rolling hills. The area experiences a semi-arid climate with hot summers and mild winters.

Climate is similar to the one experienced across the Absheron Peninsula.

Number and composition of the population (age and gender distribution, vulnerable groups). 28 May has the population of 2,400.

Education. The settlement has one complete secondary school and one kindergarten.

Population employment. The population is mainly engaged in farming, animal husbandry and weaving.

Economy. The population mainly works in agriculture, agricultural products processing enterprises and social facilities.

Other. For various socio-economic and health activities, residents of 28 May village go to the nearby settlements of Hokmeli, Mshviqabad or Gobu.

7.9. Absheron-Garadagh WPP to Gobu ES

7.9.1. Absheron

See information given above 7.8.

7.9.2. Gobu

See information given above 7.8.3.1.

7.10. Traffic

7.10.1. Introduction

To properly plan the future project and prevent possible negative impacts on the transport network of the Project AoI, pavement quality and traffic intensity on the main roads crossed by the Project facilities or potentially used as their access roads were assessed within the SBS framework. The assessment results are reflected in the following paragraphs.

7.10.2. Road Infrastructure of the Project AoI

The assessment covered the following main roads, described from the west to the south in Mingachevir-Navahi section, and from the south to the north in Navahi-Gobu section:

Mingachevir highway. The highway is one of the two main entrance roads of Mingachevir. Starting from Aran settlement at Baku-Alat-Gazakh-Georgia highway in the south, the 2-4 lane road is 27.4 long. The highway will be crossed by “Azerbaijan TPP-Navahi SS” OHL in the southern suburbs of Mingachevir. Also, the highway will be actively used as an access road for transportation of the construction materials.

Khaldan-Mingachevir highway. Starting from Baku-Shamakhi-Yevlakh highway in the east, the highway is one of the two main entrance roads of Mingachevir, and the shortest road connecting the town with Aghdash, Goychay, Aghsu, Shamakhi and Baku. The 4-lane highway is 17.2 km long. The road will be crossed by “Azerbaijan TPP-Navahi SS” OHL in the town’s suburb district “Yeni Heyat”. Also, the highway will be actively used as an access road for transportation of the construction materials.

Baku-Shamakhi-Yevlakh highway (M4). The highway is the shortest of the two existing main roads connecting Baku and Mingachevir with each other, as well as Aghdash, Goychay, Shamakhi, Gobustan and Khirdalan towns. Starting from the northern suburbs of Baku in the east, the road runs across the mountainous Gobustan and, after leaving the mountainous area via the Aghsu pass, extends along the southern foothills of the Ajinohur-Langabiz mountains. The 1st category road is 274 km long. It consists of 4 lanes in the section between Baku and Mughanli, and 2 lanes at the Aghsu pass, and 2-4 lanes in the remaining parts of the highway. Different parts of the highway will be used as access roads for transporting construction materials to the “Azerbaijan TPP-Navahi SS” OHL. The OHL cross the highway In two segments, namely the road’s 266th km to the east of Mingachevir, and in the northern suburbs of Goychay in the road’s Garamaryam-Goychay segment.

Yevlakh-Zagatala-Georgia highway. 62.1 km long highway is one of the most important roads in the project AoI, connecting Baku-Alat-Gazakh-Georgia highway with Sheki, Zagatala and other towns in of the northwestern Azerbaijan and northeastern Georgia. Consisting of 2 lanes and belonging to 1st category roads, the highway is crossed by “Azerbaijan TPP-Navahi SS” OHL in the northeastern outskirts of Gulovsha village.

Aghdash-Zaraghan (Gabala) highway. 71.9 km long highway is one of the most important south-north trending inter-district roads of the central regions of Azerbaijan, providing the shortest access from Aghdash to Gabala and other touristic districts of the northwestern Azerbaijan. The 2-lane highway is crossed by “Azerbaijan TPP-Navahi SS” OHL in the river valley of Turyanchay in the southern outskirts of the same-name village.

Garamaryam-Mususlu road. 23.9 km long road is a district-level 2-lane asphalt road connecting two large settlements of the Goychay district, and then extending to the north connecting the district with Ismayilli. “Azerbaijan TPP-Navahi SS” OHL cross the road in the northern outskirts of Inja settlement.

Aghsu-Kurdamir road. 31.2 km long 2-lane road connects the administrative centers of Aghsu and Kurdamir districts. The road is crossed by “Azerbaijan TPP-Navahi SS” OHL in the area between Takla and Aghsu.

Sahil-Mushfigabad road. 23.9 km long 2-lane road starts from Baku-Alat-Yevlakh-Gazakh highway, connecting Sahil settlement of Greater Baku in the south and Mushfigabad settlement of Absheron district in the north. The road is crossed by “Gobustan-Gobu” OHL 2 km to the south of 28 may settlement.

7.10.3. Traffic intensity assessment methods

To evaluate the traffic intensity on the roads of the Project area and to assess its’ seasonal dynamics, traffic surveys were conducted at the following 8 locations:

TP1 Sahil-Mushfigabad road – crossing point with “Gobustan-Gobu” OHL

TP2 Aghsu-Kurdamir road - crossing point with “Azerbaijan TPP-Navahi SS” OHL

TP3 Garamaryam-Mususlu road – crossing point with “Azerbaijan TPP-Navahi SS” OHL

TP4 Garamaryam-Goychay segment of Baku-Shamakhi-Yevlakh highway – crossing point with “Azerbaijan TPP-Navahi SS” OHL

TP5 Aghdash-Zaraghan road – crossing point with “Azerbaijan TPP-Navahi SS” OHL

TP6 Yevlakh-Zagatala-Georgia highway – crossing point with “Azerbaijan TPP-Navahi SS” OHL

TP7 Khaldan-Mingachevir highway – crossing point with “Azerbaijan TPP-Navahi SS” OHL

TP8 Mingachevir highway – crossing point with “Azerbaijan TPP-Navahi SS” OHL

To study the traffic intensity variations depending on different objective aspects, surveys were organized according to specially developed time schedules. The monitoring activities were implemented on July 29 – August 5, 2024 (Monday-Monday) with 1 day spent on each of the monitoring points.

At each of the above-mentioned stations, two observation posts were installed in order to record vehicles moving in both directions. The location map of the stations is presented in Figure 7.5. Each survey had covered a 13-hour daytime period, with 7:00 AM – 8:00 PM traffic counts carried out for every survey location. The produced data was recorded in the special registration sheets, divided into 15-minute intervals and grouped around the following traffic categories: a) agricultural machines, b) cars c) trucks, d) minibuses, and e) buses. Completed Vehicle Registration Forms are presented in Annex 4.

Figure 7.12: Photos from traffic intensity monitoring activities

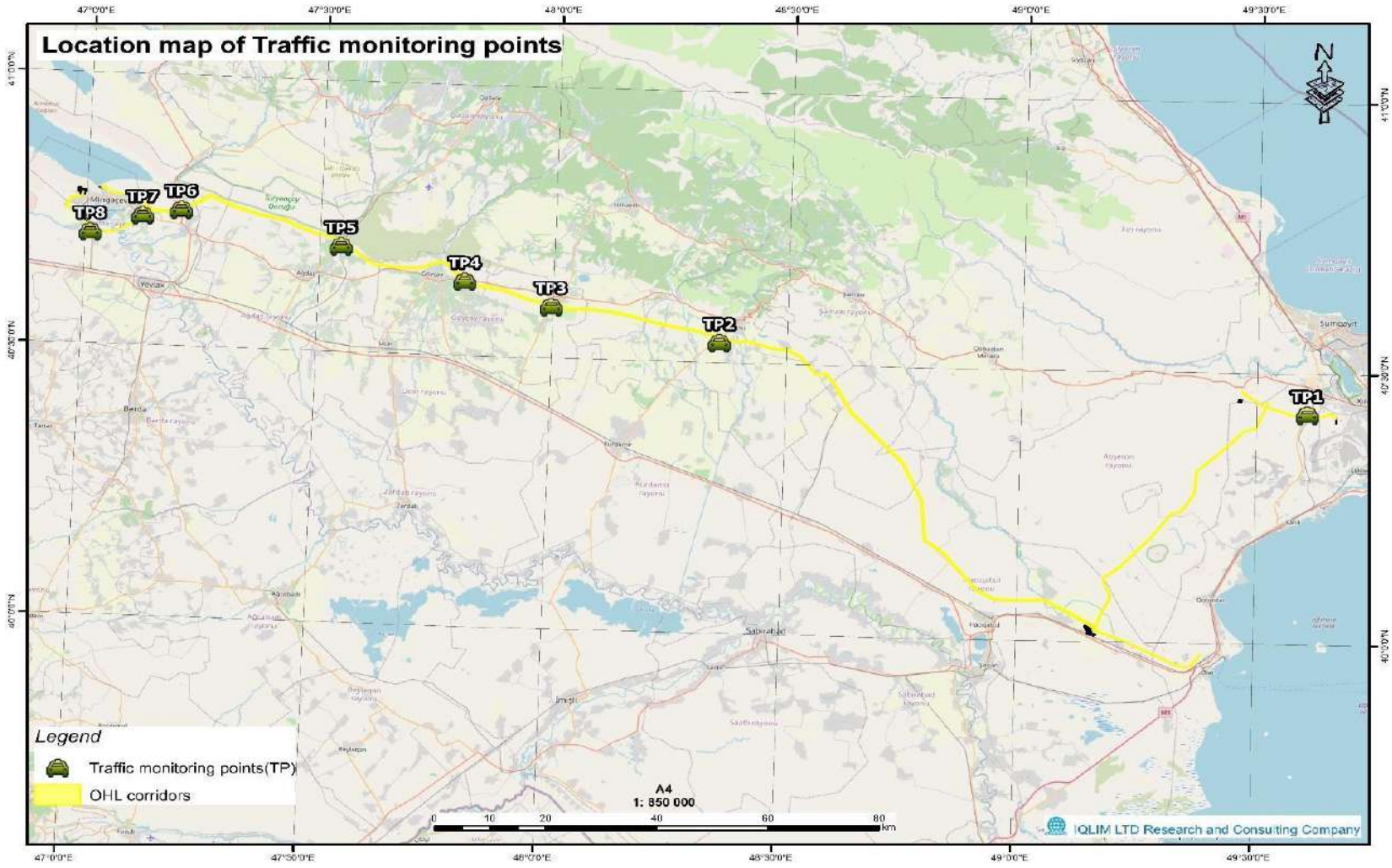


Figure 7.13: Location map of traffic intensity monitoring stations.

7.10.4. Discussion of study results

The following regularities were determined as a result of the traffic intensity surveys conducted in the Project area:

Within the monitoring timeframe, the highest traffic intensity was observed on the entrance highway to Mingachevir (5764 traffic counts on TP8), apparently due to the fact that the town is the most densely populated settlement of the Project AoI with well-developed economic and social facilities.

Generally high intensity volumes were recorded on main transport corridors of the regional (4110 traffic counts on Baku-Shamakhi-Yevlakh highway) and international (5009 traffic counts on Yevlakh-Zagatala-Georgia highway) importance.

High traffic intensity levels were also recorded on the roads taking to the regions with well-developed touristic infrastructure (3158 traffic counts on Aghdash-Zaraghan road), and on Sahil-Mushfigabad road (4189 traffic counts) due to its' proximity to the industrial areas of Greater Baku and Absheron district.

The lowest traffic intensity was recorded on the district-level roads of Aghsu, Kurdamir and Goychay (2132 traffic counts on Aghsu-Kurdamir road, 608 traffic counts on Garamaryam-Mususlu road).

Each monitored road demonstrated different peak traffic intensity hours, usually observed before and after business hours close to Mingachevir, and morning, noon and evening hours on the roads afar from major towns.

Speaking about the shares of different vehicle types, it deserves mentioning that all monitored roads are characterised by a prevalence of passenger cars.

The share of agricultural vehicles was sensible on the district-level roads.

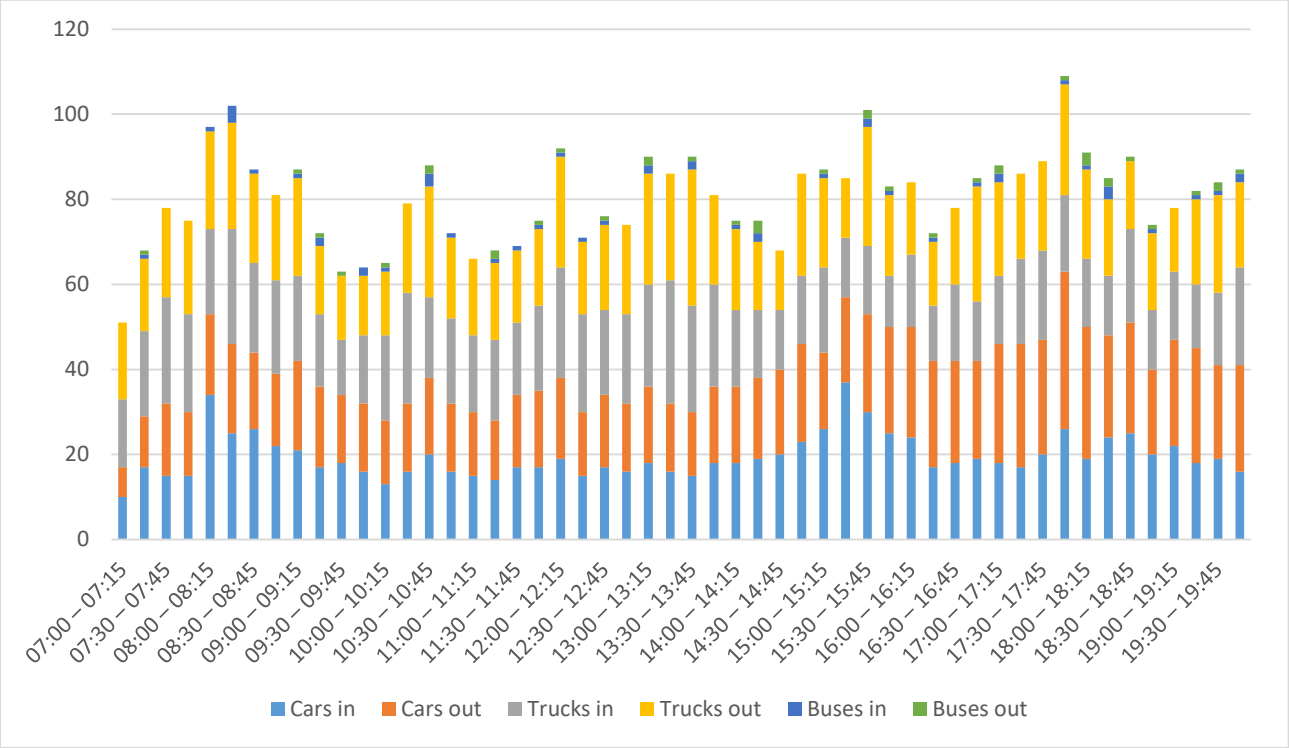


Figure 7.14: Daily traffic intensity indicators: Sahil-Mushfigabad road (TP1)

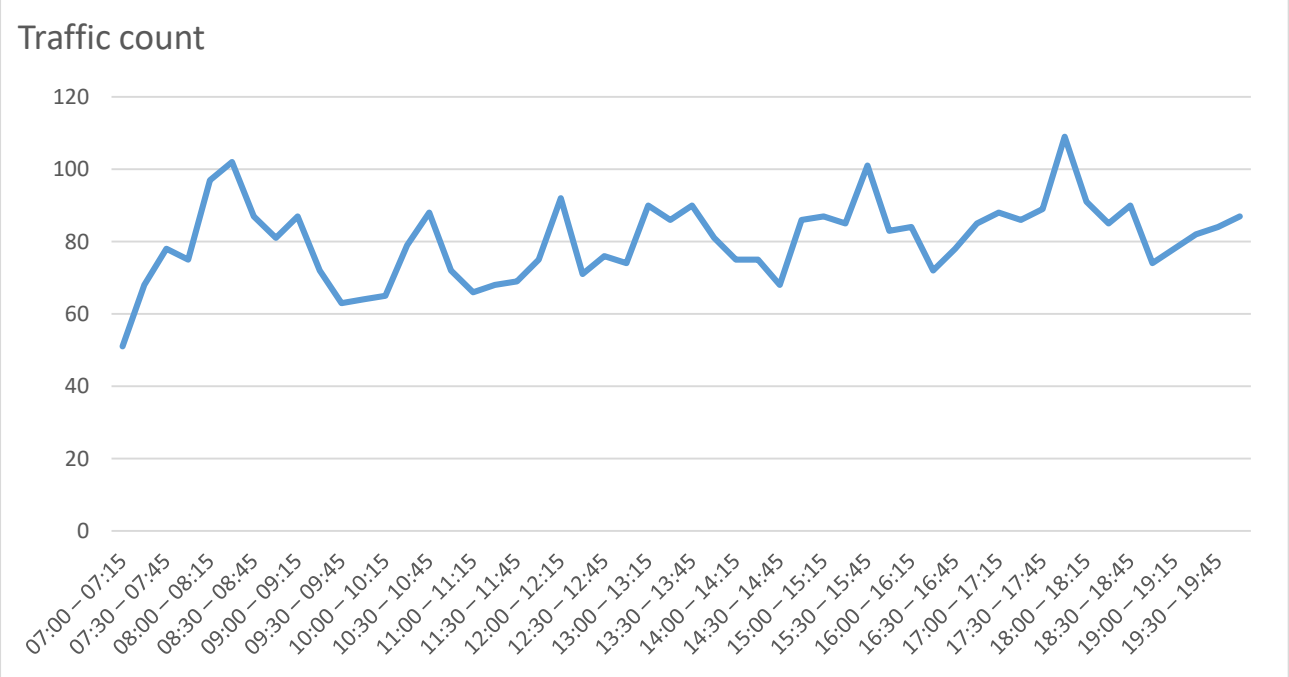


Figure 7.15: Daily total traffic dynamics: Sahil-Mushfigabad road (TP1)

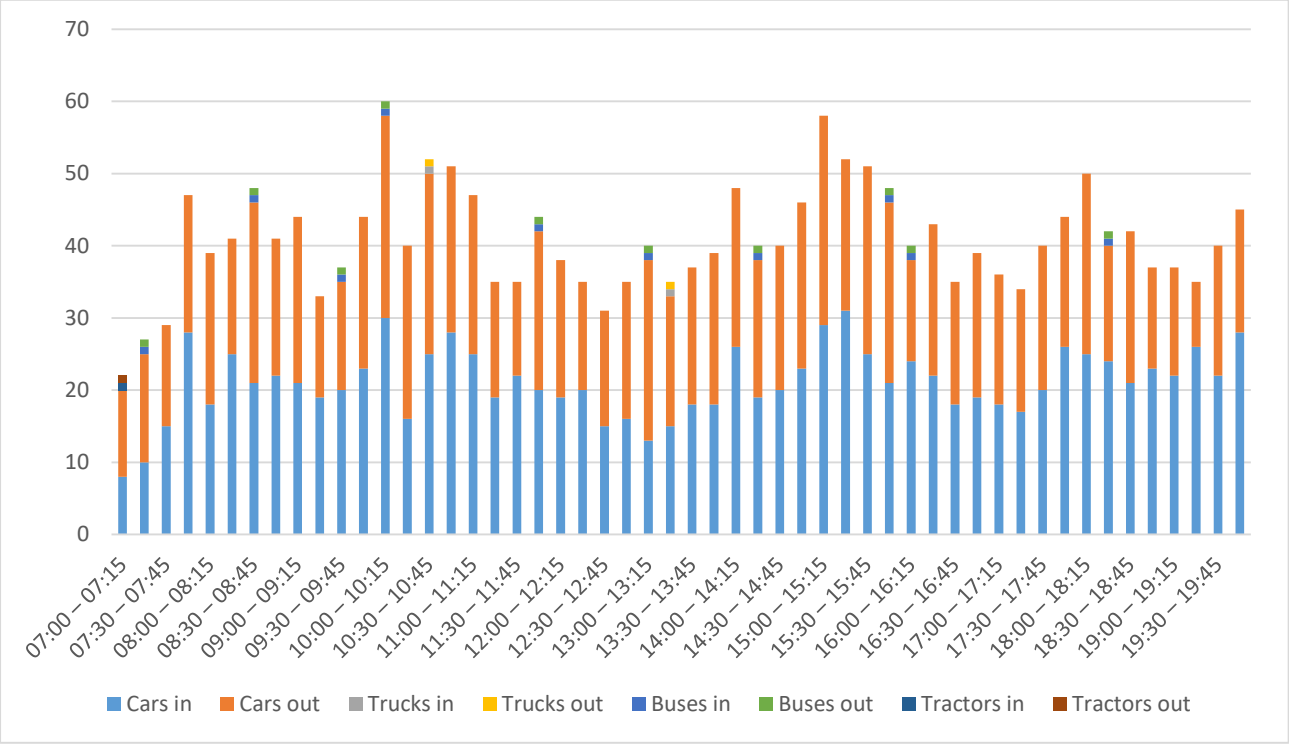


Figure 7.16: Daily traffic intensity indicators: Aghsu-Kurdamir road (TP2)

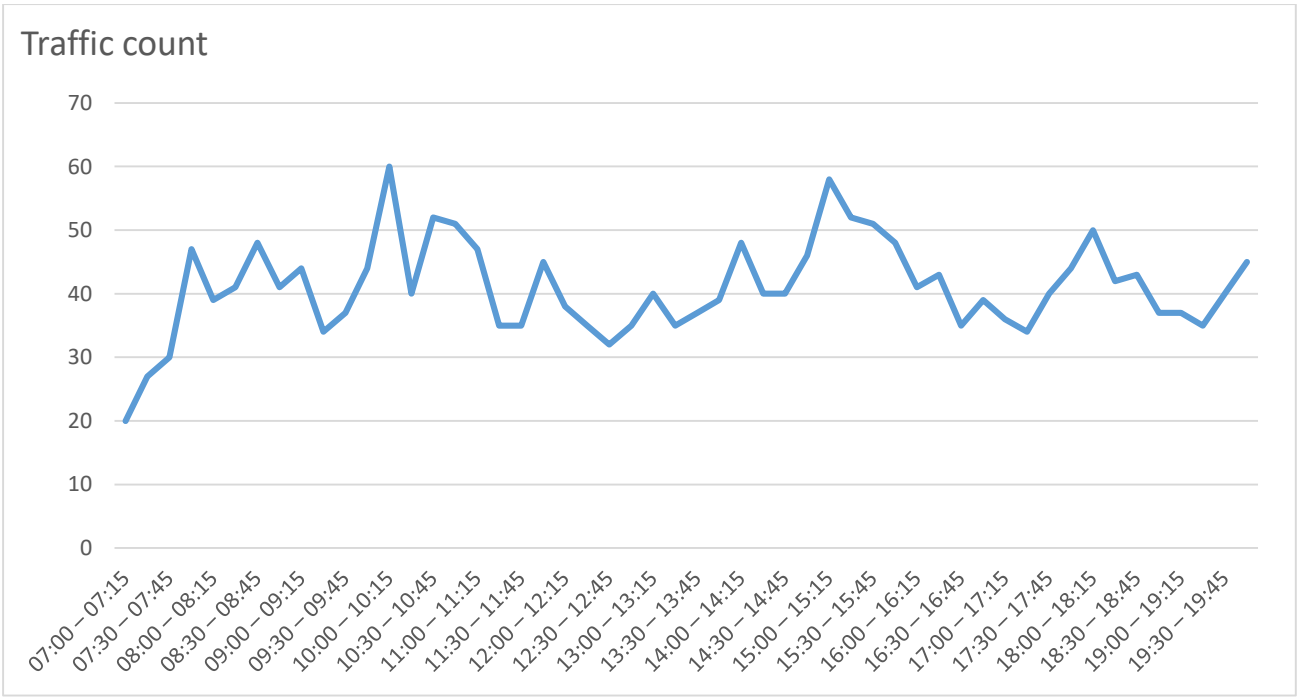


Figure 7.17: Daily total traffic dynamics: Aghsu-Kurdamir road (TP2)

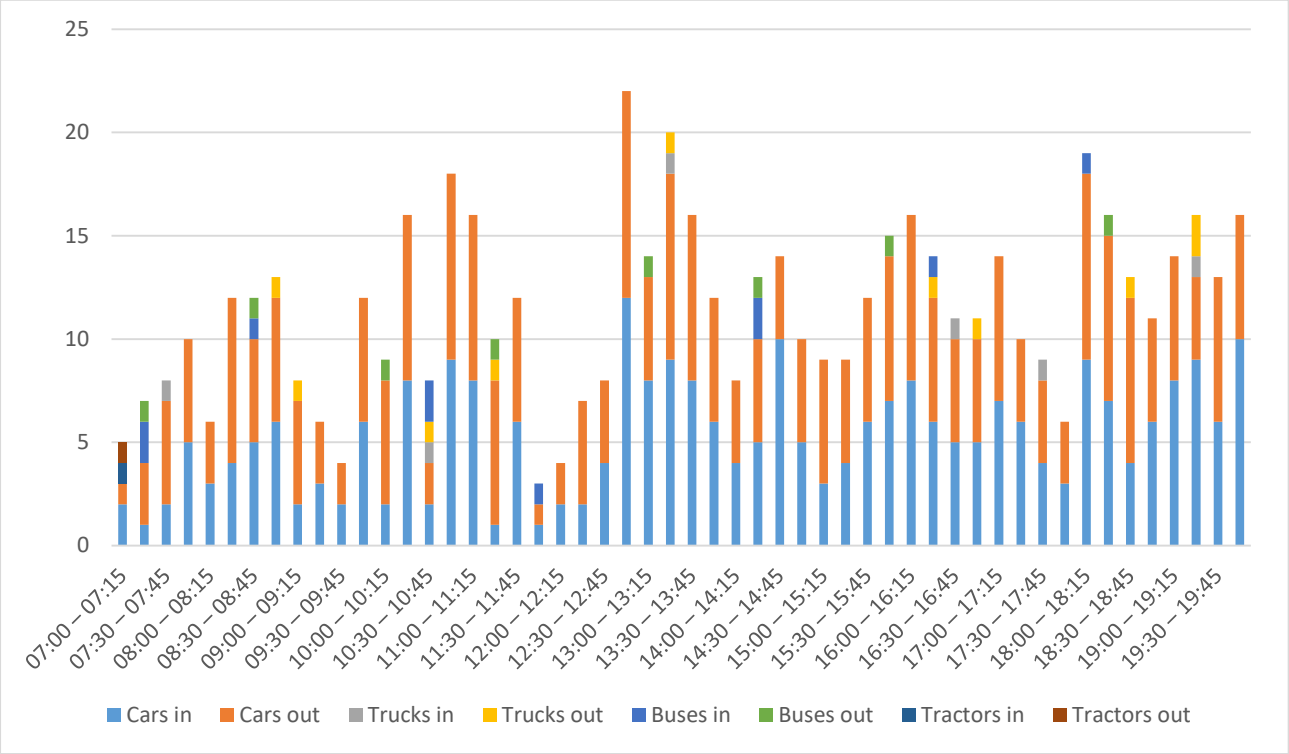


Figure 7.18: Daily traffic intensity indicators: Garamaryam-Mususlu road (TP3)

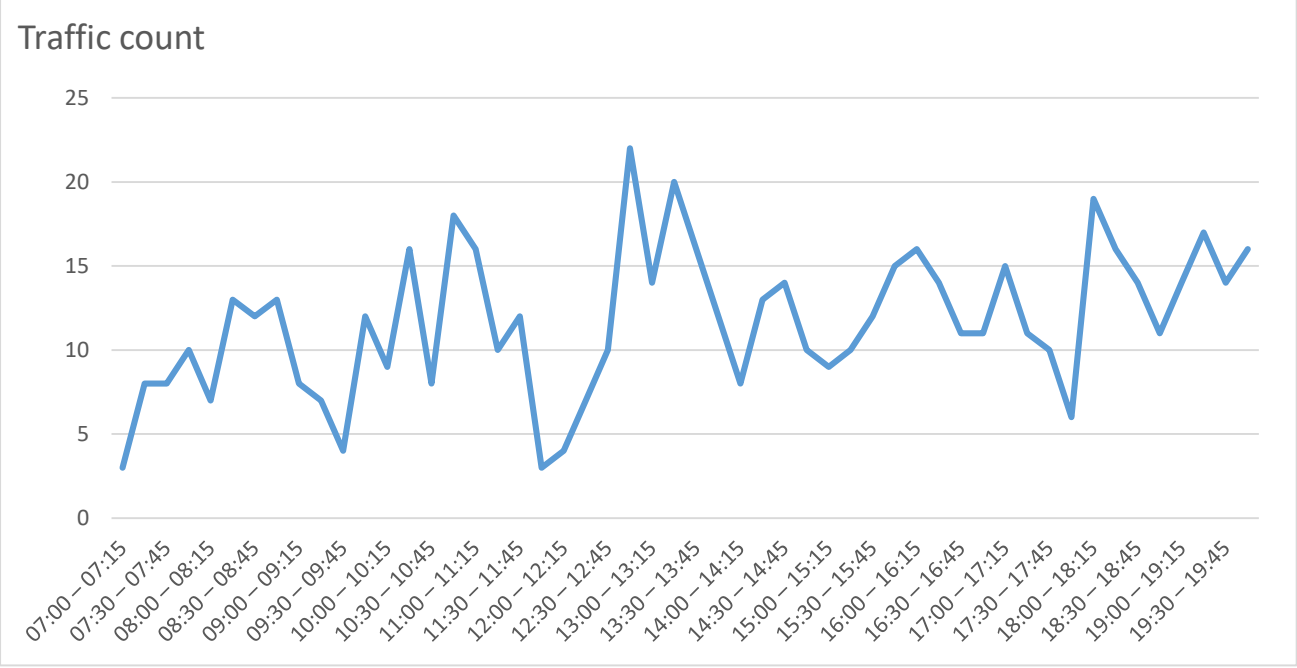


Figure 7.19: Daily total traffic dynamics: Garamaryam-Mususlu road (TP3)

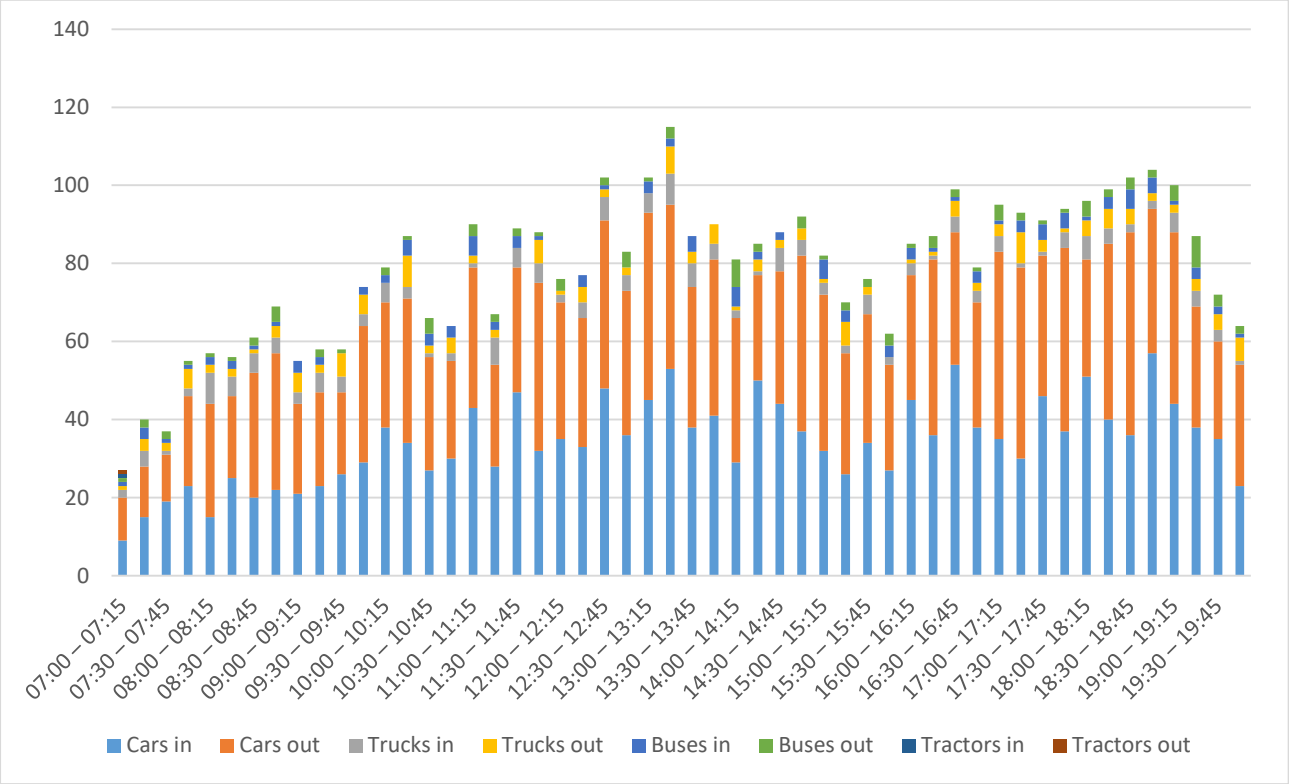


Figure 7.20: Daily traffic intensity indicators: Baku-Shamakhi-Yevlakh hwy - Garamaryam-Goychay (TP4)

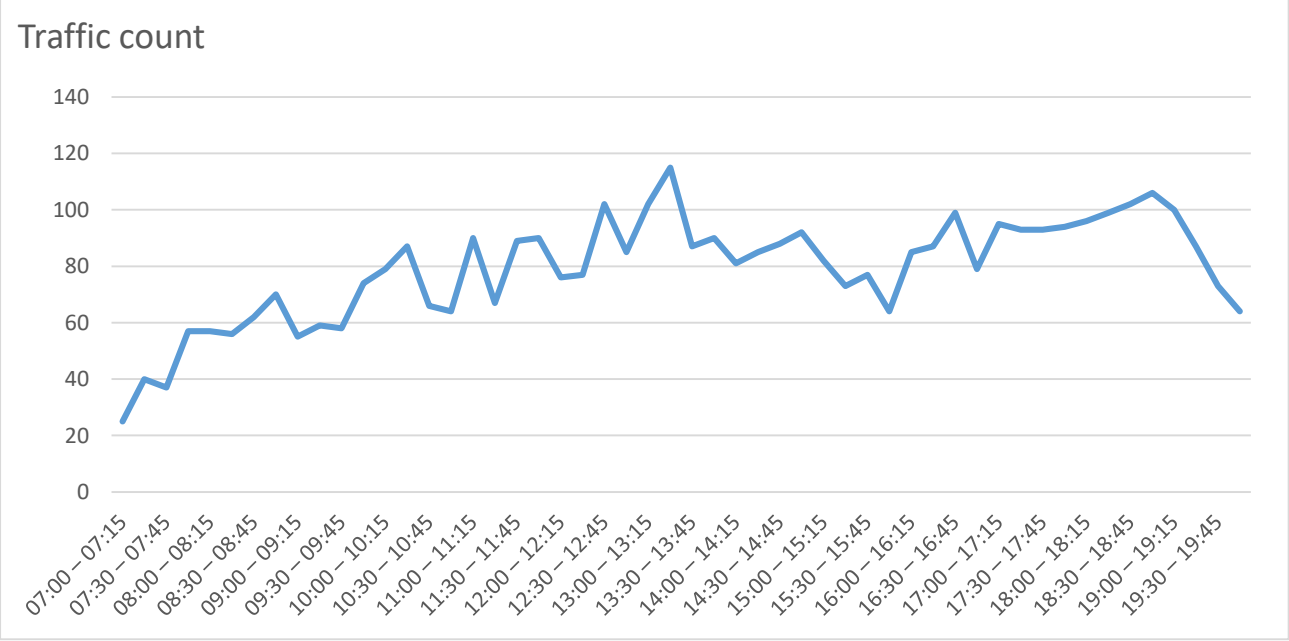


Figure 7.21: Daily total traffic dynamics: Baku-Shamakhi-Yevlakh hwy - Garamaryam-Goychay (TP4)

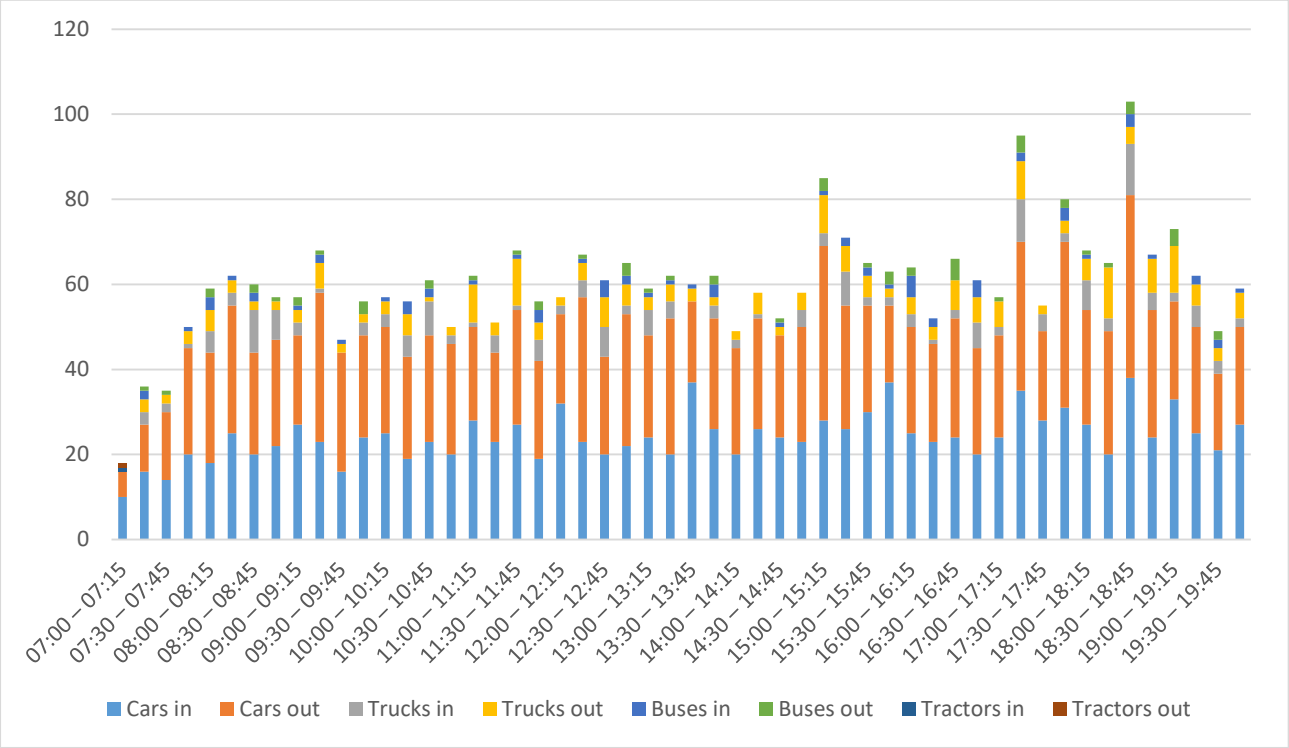


Figure 7.22: Daily traffic intensity indicators: Aghdash-Zaraghan road (TP5)

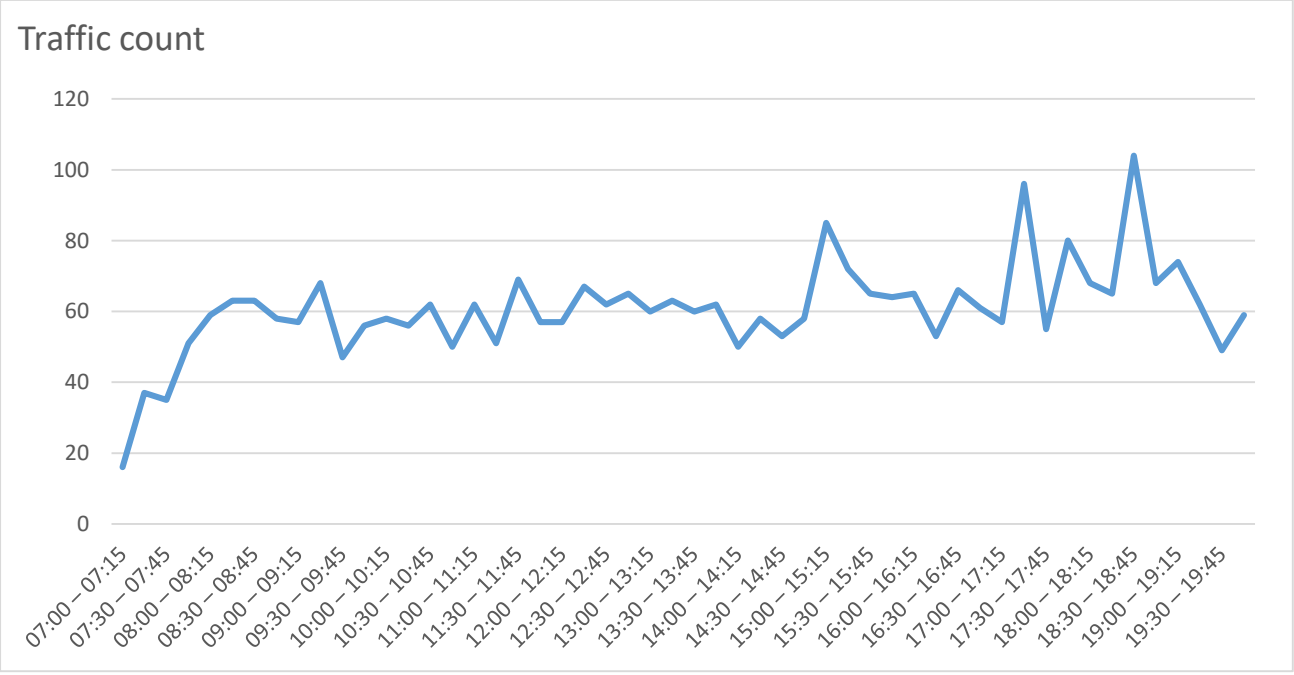


Figure 7.23: Daily total traffic dynamics: Aghdash-Zaraghan road (TP5)

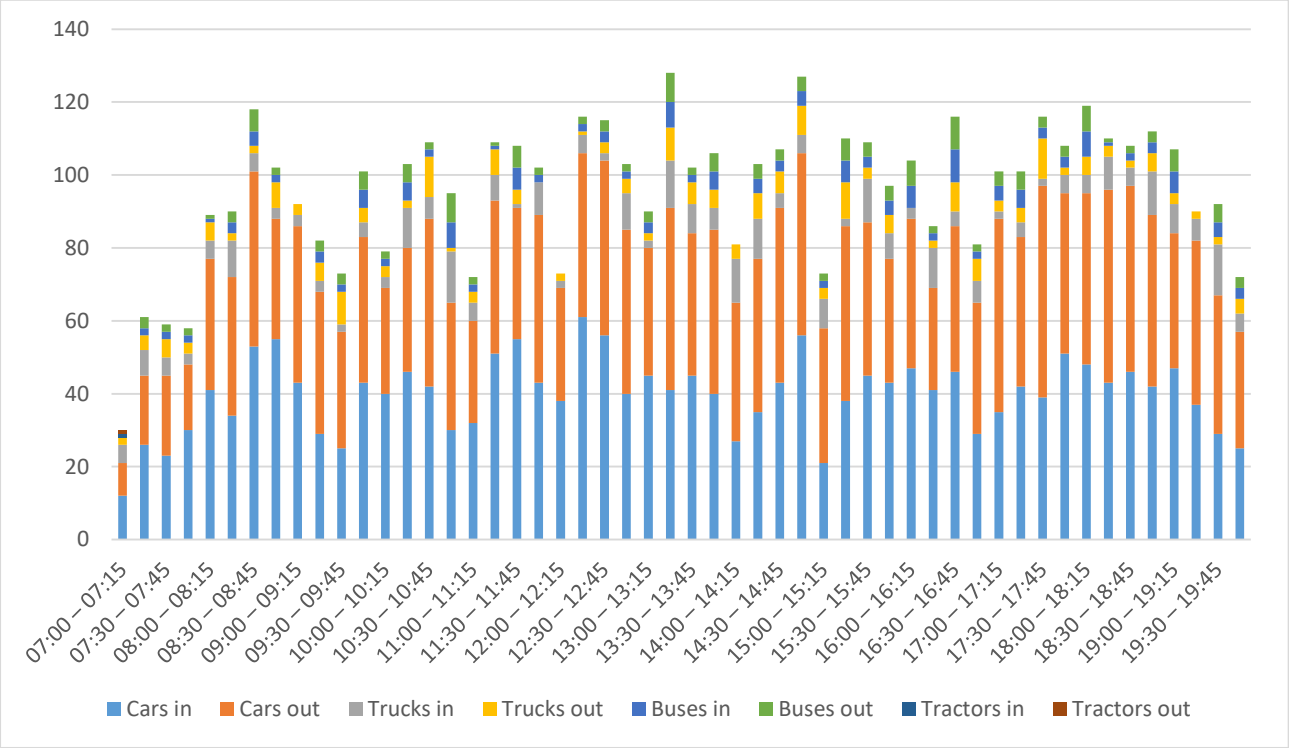


Figure 7.24: Daily traffic intensity indicators: Yevlakh-Zagatala-Georgia highway (TP6)

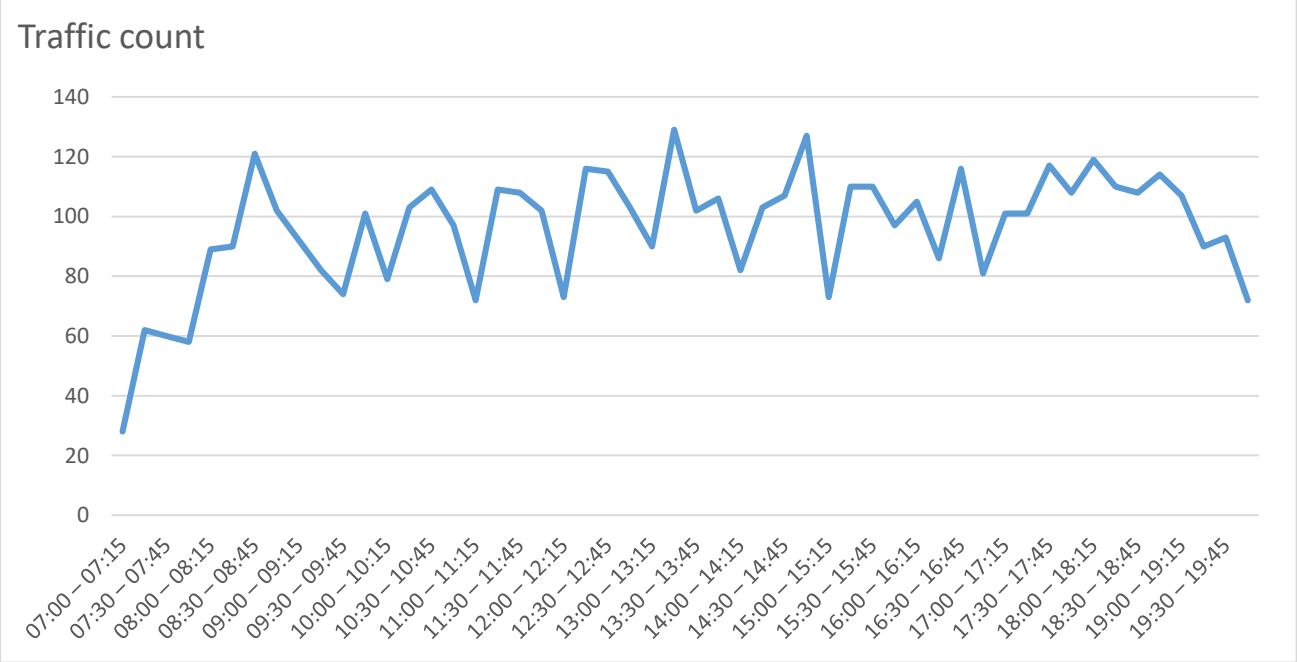


Figure 7.25: Daily total traffic dynamics: Yevlakh-Zagatala-Georgia highway (TP6)

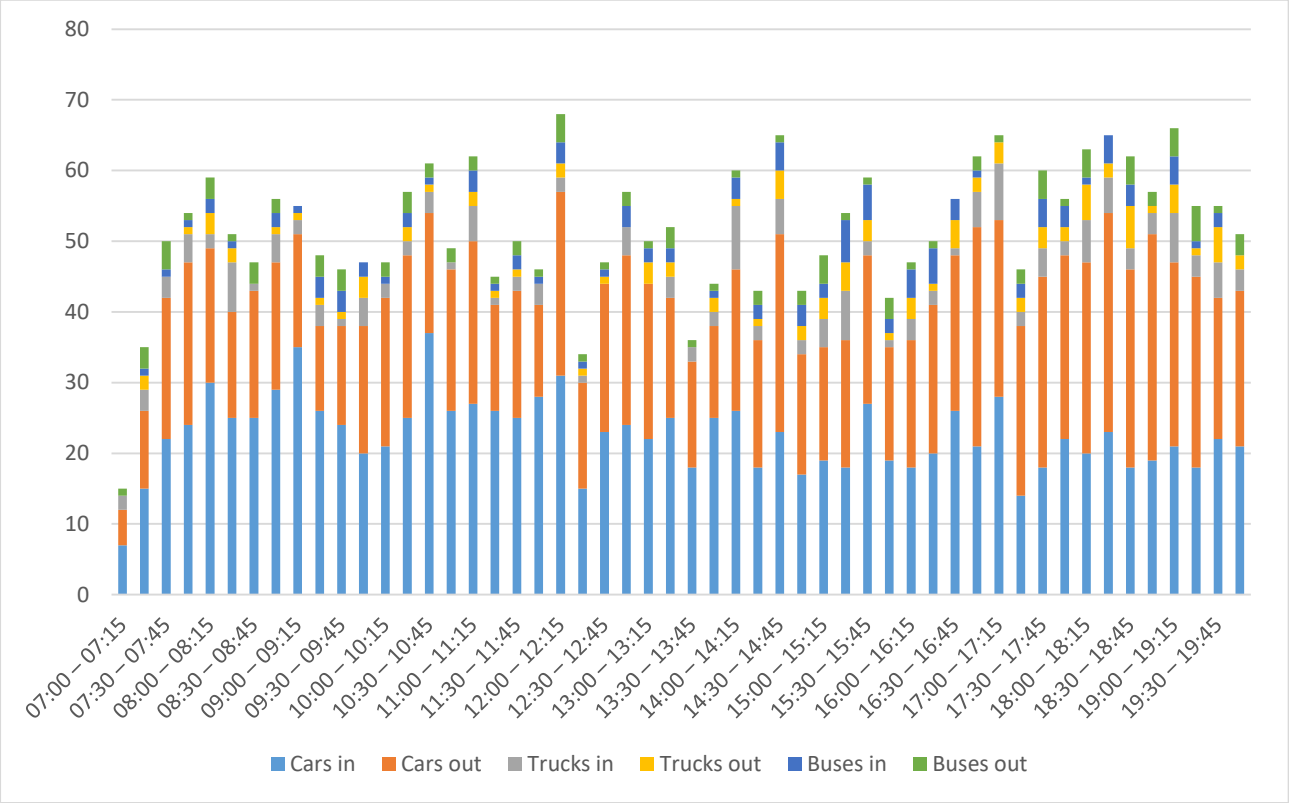


Figure 7.26: Daily traffic intensity indicators: Khaldan-Mingachevir highway (TP7)

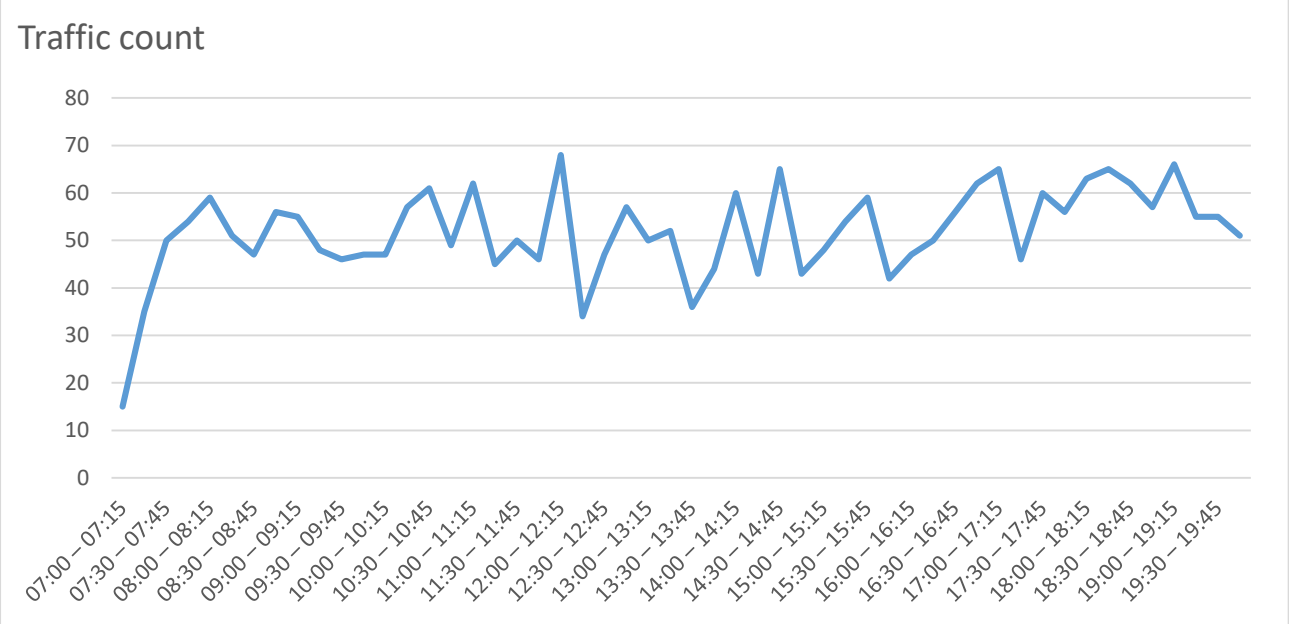


Figure 7.27: Daily total traffic dynamics: Khaldan-Mingachevir highway (TP7)

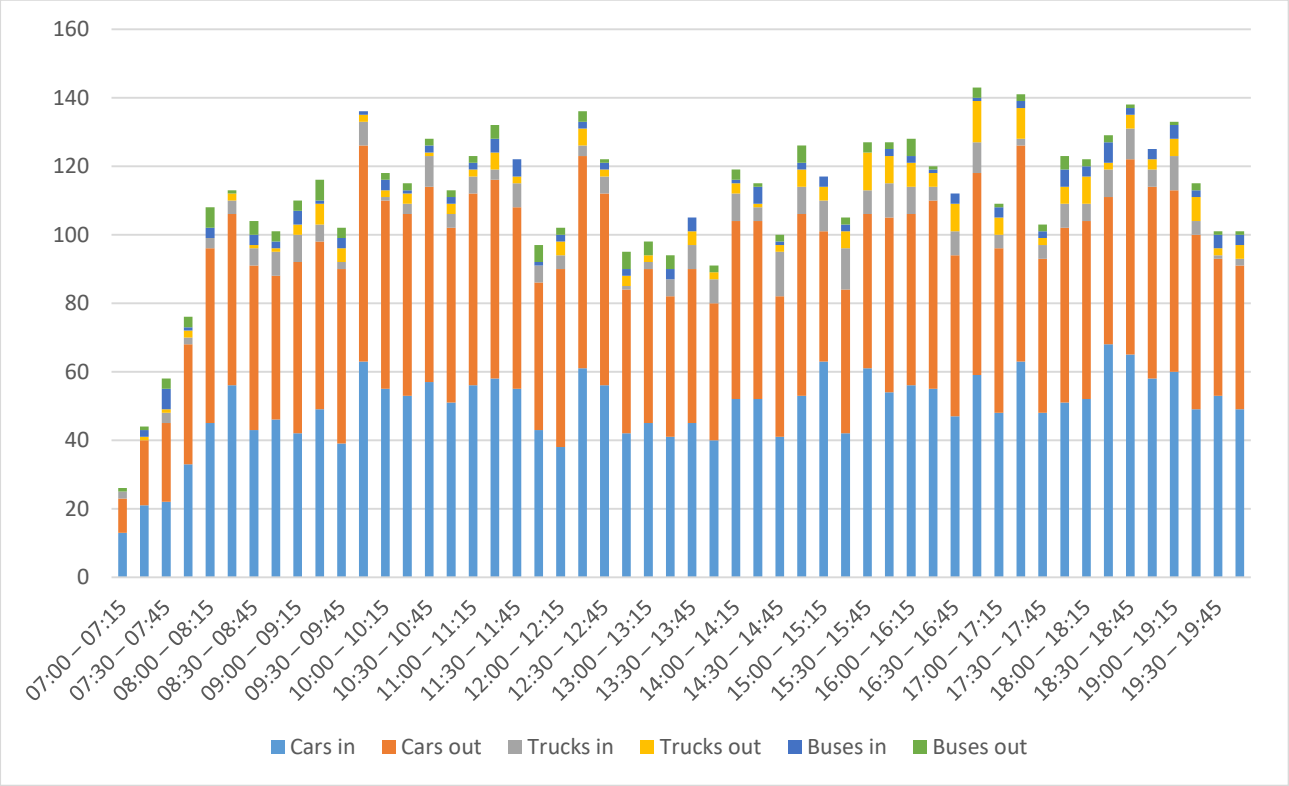


Figure 7.28: Daily traffic intensity indicators: Mingachevir highway (TP8)

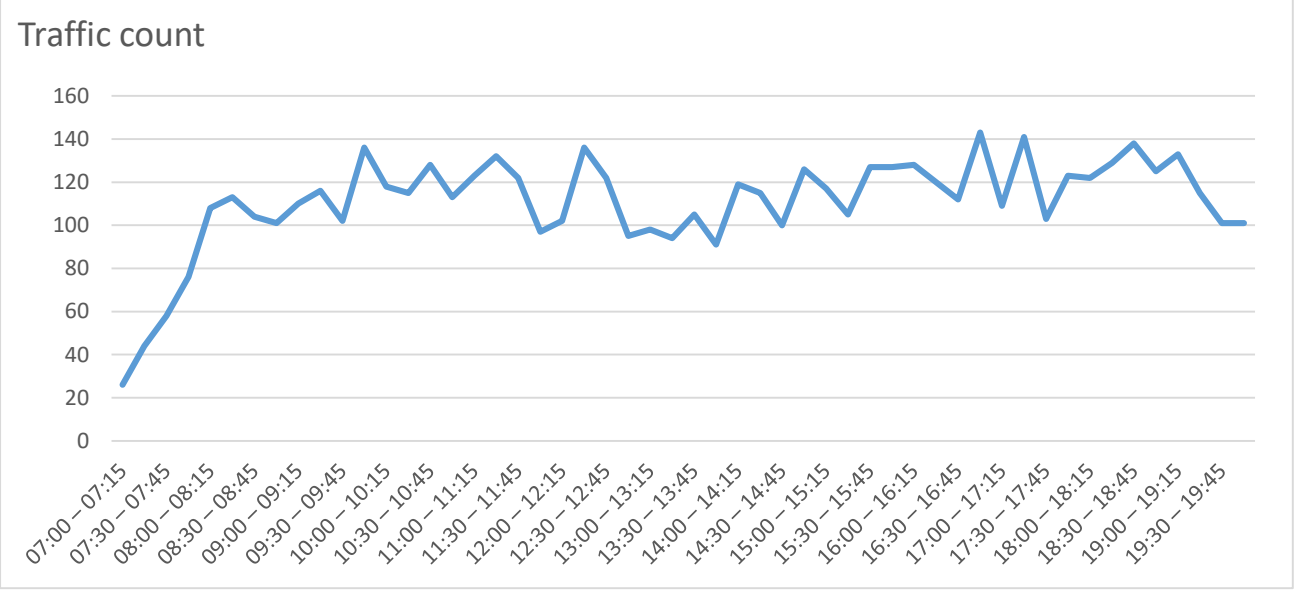


Figure 7.29: Daily total traffic dynamics: Mingachevir highway (TP8)

7.11. Historical and Cultural Heritage

7.11.1. Methodology

The following activities have been implemented to identify and describe the Project area's historical and cultural heritage:

1. Study of the reports of past archaeological expeditions, scientific reviews and summaries of the region's archaeological sites and researches dedicated to local non-material cultural heritage;
2. Interviews with experts from the ANAS Institutes of History and Archaeology and Ethnography and the Project area's local communities.
3. Focus group discussions were conducted with 34 affected communities in project crossed communities in September-October. The findings include following:
   - Hajigabul region, Gizilburun village: There is a martyr's alley, and a worship called "Velijan Pir"
   - Hajigabul region, Navahi settlement: There is a martyr's alley in the settlement.
   - Shamakhi, Chol Goyler: There is a cemetery in the village, a place with ancient stones and pots, and also there is a sacred place.
   - Shamakhi, Ovchulu: There are martyr's springs and alleys.
   - Aghsu, Bijo village: There is an ancient cemetery called "Rashidbulag".
   - Aghsu, Gegeli: There is a martyrs' alley in the village.
   - Agshu, Ulguj: There is a place called "Ruined Town" in the village.
   - Agshu, Garaqoyunlu: There is a historical monument called the Red and White Dome in the village.
   - Agdash, Hushun village: There is an old cemetery which is considered a historical monument, in the village.

7.11.2. Historical and archaeological heritage of the Project AoI

The Project AoI is distinguished for its rich historical and cultural heritage.

Mingachevir. Being the fourth largest city of Azerbaijan, Mingachevir has a long history combined with modern industrial and cultural growth. Archaeological findings show people have lived there since the Paleolithic era. The Mingachevir Archaeological Complex, one of the biggest in the South Caucasus, contains many burial sites and ancient settlements. Within this complex, the Sudagylan settlement shows homes from the 1st and 4th centuries. The modern city was founded in 1948, mainly because of the Mingachevir Hydroelectric Power Station. German prisoners of war helped build the city, leaving architectural traces still seen today. Thus, Mingachevir mixes ancient history and modern progress. Its archaeological treasures, architectural and industrial monuments of 20th century, coupled with rich cultural environment make it a special place in Azerbaijan.

Yevlakh district, known for its industrial presence, also possesses a rich historical heritage. Ancient settlements, like the Gochtepe kurgan from the 3rd millennium BC, prove the area's long history. The medieval city of Arash once thrived within the district. Yevlakh city itself originated as a railway station in the 1880s, known as "Vagzal". It progressively grew into a village and then a town, finally being recognized as Yevlakh city in 1939. The mid-20th century saw significant industrial development, making Yevlakh a hub for cotton processing, food production, and machinery manufacturing. This industrial growth shaped the city's present-day appearance and character. Although not as famous as other historical sites in Azerbaijan, Yevlakh's heritage provides a glimpse into the nation's extensive and diverse history. The blend of ancient remnants and industrial past further enriches the region's cultural landscape.

Aghdash. The district is rich in historical and cultural heritage, intertwined with its agricultural landscape. The 18th-century Uryan Gala Fortress highlights the region's past strategic importance. Numerous ancient mosques and mausoleums show the deep Islamic faith of the area. The Aghdash Museum of History and Ethnography holds artifacts showcasing the district's history, culture, and traditions. Rich folklore and traditions, including folk songs, dances, and handicrafts, are still practiced. Archaeological sites reveal ancient settlements and burial mounds, proving the area's long history. The district's cuisine, shaped by agriculture, features dishes like "dovga", "piti", and various pilafs. Aghdash's historical and cultural heritage is a testament to its vibrant past and enduring traditions, inviting exploration of Azerbaijan's rich cultural landscape.

Goychay. The district is known for its natural beauty and historical importance. It has a rich cultural heritage from centuries of human activity. Archaeological finds show settlements from the Bronze and Iron Ages. Medieval monuments like the 12th-century Maiden Tower and the 13th-century Goychay Bridge show the region's past importance. The district has many mosques and shrines, reflecting its strong Islamic faith. Skilled artisans continue traditional crafts like carpet weaving, pottery, and copperwork, passed down through generations. Goychay is rich in folklore, music, storytelling, and dance, and has produced famous musicians and poets. Its cuisine, influenced by agriculture, features dishes like Goychay Kebab and Goychay Plov.

Aghsu. The district is also very rich in historical heritage. The ancient Ram Statues, from the Middle Ages, symbolize abundance and strength. The medieval city of Aghsu, once the largest in Azerbaijan, shows the region's historical importance. Its remains, including the Aghsu Fortress, offer a glimpse into past architectural practices. Aghsu District also has revered religious sites like the Sheikh Dursun Mausoleum, Sheikh Amir Ahmed Mausoleum, and Pir Bakhtiyar Mausoleum. The Shikhmezid Neighborhood in Aghsu city has remnants of ancient mosques and the Shikhmezid Tomb, a former pilgrimage site. The Red Dome and White Dome in Garagoyunlu village are unique structures showcasing a blend of architectural styles. The district is also known for its vibrant folklore, music, and dance traditions. Aghsu's historical heritage reflects Azerbaijan's rich and diverse past.

Shamakhi. The district has a long history, dating back to ancient times. For centuries, administrative center of the district had been the capital of the Shirvanshah state. The Juma Mosque from the 10th century is a landmark that survived earthquakes. Mausoleums like Shahihandan and Diri Baba show beautiful architecture. The ruins of Gulustan and Gala-Bugurt fortress give a glimpse into the past. Shamakhi was a center of science, education, art, and culture in the 10th-13th centuries. Shamakhi was famous for its silk, carpets, and rugs, playing a key role in the Silk Road trade.

Hajigabul. Archaeological finds in the district show evidence of human life there from the Bronze and Iron Ages. The Pir Huseyn Khanagah, a 17th-century religious complex, reflects the region's Islamic faith and architecture. The Garasu mud volcano, being a natural phenomenon, also has cultural importance for its therapeutic uses. The district is known for its vibrant folklore, music, and dance traditions. Its cuisine, influenced by agriculture and the Caspian Sea, features dishes like "fish plov" and seafood. Hajigabul's heritage blends ancient settlements, religious sites, natural wonders, and cultural traditions, providing a deeper understanding of its history and contribution to Azerbaijan's culture.

Gobustan. The district is world-famous for its historical and cultural treasures, mainly the Gobustan Rock Art Cultural Landscape, a UNESCO World Heritage Site. This site, called the "Stone Age Louvre", has over 6,000 ancient rock engravings showing the lives of prehistoric people. Besides the Gobustan rock art, the district has many other petroglyphs and archaeological sites showing its prehistoric past. The Gaval Dash, a natural musical stone, has been used in traditional Azerbaijani music for centuries. Gobustan's historical heritage shows the region's long and rich history, from prehistoric times to today. Also, there are many valuable places of worship and sacred natural monuments located in the district.

Absheron. The district has a rich historical heritage, despite being overshadowed by Baku. It has mosques and shrines showing its Islamic traditions, like the 19th-century Abdurrahman Mosque. Medieval hammams and ancient wells provide glimpses into the past. Tombs and burial sites from the 8th to 18th centuries offer insights into funerary practices. Skilled artisans continue traditional crafts like carpet weaving and pottery. The district's folklore, music, and storytelling traditions are still alive. Agricultural practices shaped by the arid climate and the Caspian Sea also contribute to its cultural heritage. Absheron's historical heritage reflects its rich past and enduring traditions, showcasing Azerbaijan's cultural evolution.

The total of 31 historical and cultural monuments were identified in the Project AoI within the framework of Project design and ESIA studies (Table 7.6). Location map of the monuments is given in Figure 7.22.

Table 7.16. List of registered historical and cultural monuments located in the Project AoI

No	Name of monument	Inventory No:	Address of monuments	Coordinates of monument
1	Bath	4004	Absheron district, Gobu settlement	40°24'43.20"N 49°43'7.10"E
2	Shahargah	1708	Shamakhi district, Chol Goylar village	40°26'19.80"N 48°37'40.80"E
3	“Shahargah “kurgan	Recently discovered	Shamakhi district, Chol Goylar village	40°26'6.20"N 48°37'16.60"E
4	Sakhsilitakhta residential place	1710	Shamakhi district, Chol0Goylar village	40°26'6.74"N 48°37'16.75"E
5	Pirabagdad necropolis	1711	Shamakhi district, Chol0Goylar village	40°25'46.40"N 48°36'53.30"E
6	“Najaf“ early medieval residential place	Recently discovered	Shamakhi district, Chol-Goylar village	40°24'6.30"N 48°38'54.90"E
7	Old cemetery	1709	Shamakhi district, Chol-Goylar village	40°25'49.20"N 48°37'0.80"E
8	Sofu Sadig residential place and ovdan	6014	Shamakhi district, Chol-Goylar village	40°24'17.20"N 48°38'46.20"E
9	Residential place	6013	Shamakhi district, Chol-Goylar village	40°25'44.80"N 48°36'57.30"E
10	Tapadibi residential place	6012	Shamakhi district, Chol-Goylar village	40°25'39.89"N 48°37'7.85"E
11	Shahargah cemetery	1709	Shamakhi district, Chol-Goylar village	40°25'49.20"N 48°37'0.80"E
12	Monument to Turkish martyrs	Recently discovered	Goychay district, Bighir village	40°38'7.20"N 47°51'30.30"E

No	Name of monument	Inventory No:	Address of monuments	Coordinates of monument
13	Jar necropolis	1073	Goychay district, I Arabjabirli village	40°39'3.30"N 47°42'7.60"E
14	Cemetery	1074	Goychay district, II Arabjabirli village	40°39'6.40"N 47°42'20.80"E
15	Memorial monument of the compatriots who died in the Great Patriotic War	5641	Goychay district	40°39'52.20"N 47°44'31.60"E
16	Cemetery	1076	Goychay district, Garamaryam village	40°36'2.60"N 48° 0'0.60"E
17	Nargizava necropolis	Recently discovered	Aghsu district, Gagali village	40°31'28.54"N 48°30'21.29"E
18	Shikhalibayli ditch	Recently discovered	Aghsu district, Gagali village	40°31'41.50"N 48°29'6.20"E
19	Aghsu medieval town	808	Aghsu district, Ulguj village	40°32'36.18"N 48°22'35.48"E
20	Bridge	Recently discovered	Hajigabul district Gizilburun village	40° 00'13.2"N 49°12'44.00"E
21	Hacı Hashim bath	Recently discovered	Hajigabul district Ranjbar village	40° 5'43.32"N 49° 4'5.53"E
22	Arash town place	Recently discovered	Yevlakh district, Arash village	40° 44'55.42"N 47°13'40.42"E
23	Remnants of Arash castle	Recently discovered	Yevlakh district, Arash village	40° 44'55.42"N 47°13'40.42"E

More detailed studies of the identified heritage sites shall be implemented during the preparation and construction phase of the Project, based on Cultural Heritage Management Plan to be developed by the Client.

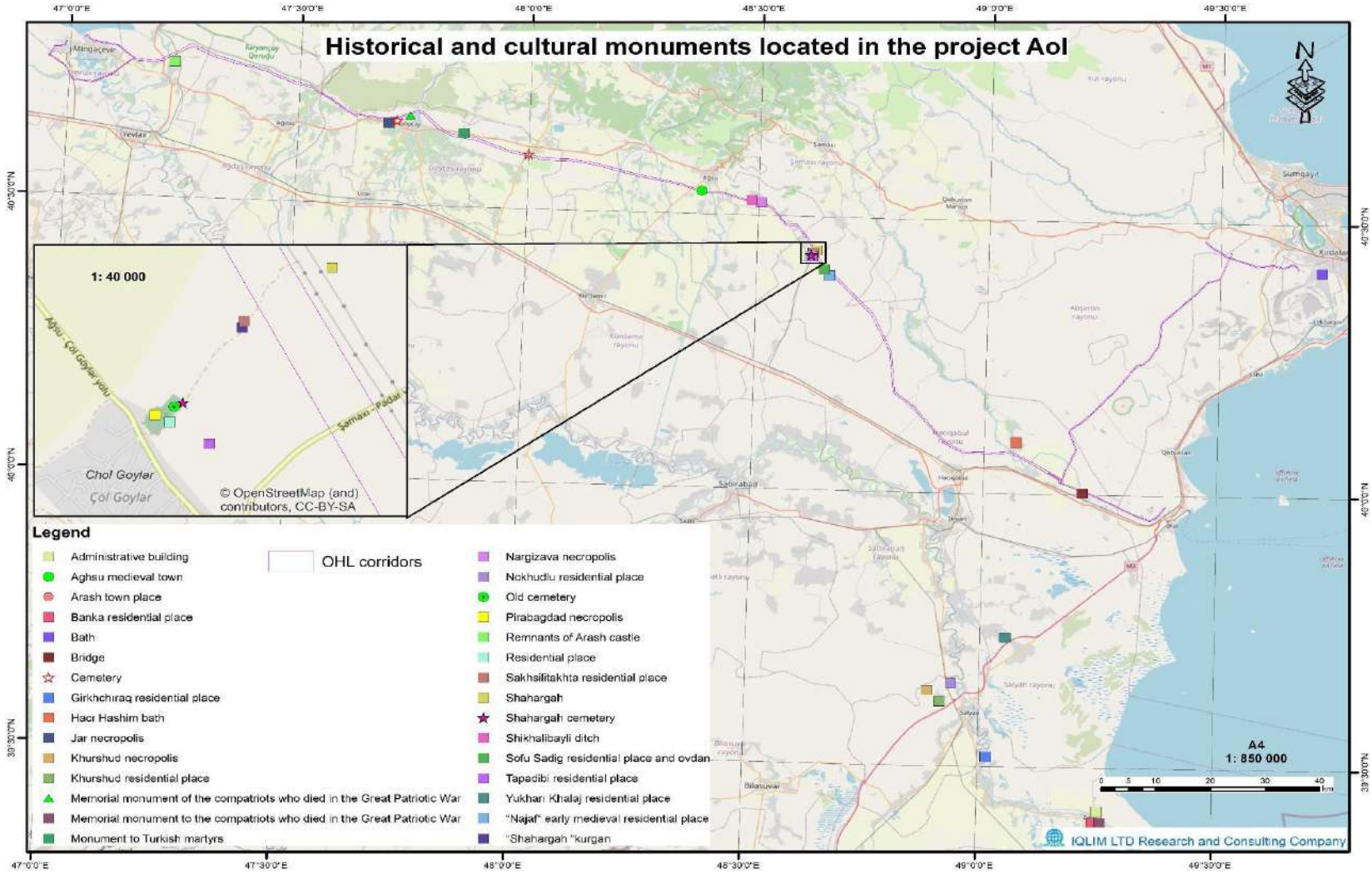


Figure 7.30. Location map of historical monuments within Project AoI

7.11.3. Sensitive objects identified during field studies

Within the SBS framework, field surveys were implemented along OHL corridors and around substation sites to identify sensitive cultural heritage and spiritual objects which were not included in the above list of protected monuments. The surveys targeted cemeteries, sacred places and less important historical monuments, as well as education, healthcare and cultural facilities of the Project AoI settlements situated close to the OHL rights-of-way and the potential access roads of the Project. The list and coordinates of the identified objects is provided in the Table below. Their location maps are provided in the following figures.

Table 7.17. Cultural spaces identified in the direct impact area of the Project

#	Name	District	Settlement	Coodrinates	
				N	E
1	Cemetery	Yevlakh	Aksham	40°44'53.00"N	47° 9'30.00"E
2	Mosque	Yevlakh	Aksham	40°44'43.00"N	47° 9'24.00"E
3	School	Yevlakh	Aksham	40°44'17.00"N	47° 9'30.00"E
4	Cemetery	Yevlakh	Gulovsha	40°44'50.00"N	47°10'45.00"E
5	School	Yevlakh	Gulovsha	40°44'10.00"N	47°10'57.00"E
6	Cemetery	Yevlakh	Yukhari Bujak	40°44'43.70"N	47°12'54.62"E
7	Mosque	Yevlakh	Yukhari Bujak	40°44'20.00"N	47°13'2.00"E
8	School	Yevlakh	Yukhari Bujak	40°44'11.00"N	47°12'53.00"E
9	Cemetery	Yevlakh	Arash	40°43'45.00"N	47°13'36.00"E
10	Mosque	Agdash	Arabojaghi	40°44'3.00"N	47°24'10.00"E
11	School	Agdash	Goshagovagh	40°42'51.70"N	47°26'47.74"E
12	Cemetery	Agdash	Yukhari Agjayazi	40°42'27.27"N	47°31'7.12"E
13	Culture House	Agdash	Turyanchay	40°42'10.00"N	47°32'38.00"E
14	Cemetery	Agdash	Arab	40°41'7.21"N	47°34'40.37"E
15	Cemetery	Agdash	Hushun	40°40'54.00"N	47°33'20.00"E
16	School	Agdash	Hushun	40°40'48.00"N	47°33'21.00"E
17	Mosque	Agdash	Hushun	40°40'38.00"N	47°33'29.00"E
18	Cemetery	Agdash	Arab	40°40'33.00"N	47°34'9.00"E
19	Cemetery	Agdash	Arab	40°40'36.00"N	47°34'21.00"E
20	School	Agdash	Arab	40°40'5.00"N	47°34'1.00"E
21	School	Agdash	Arab	40°40'16.00"N	47°35'15.00"E
22	Cemetery	Goychay	II Arabjabirli	40°39'16.00"N	47°42'28.00"E
23	School	Goychay	City	40°38'58.00"N	47°43'31.00"E
24	Cemetery	Goychay	I Arabjabirli	40°39'57.00"N	47°44'18.00"E
25	Cemetery	Goychay	Garabaggal	40°38'40.00"N	47°47'45.00"E

#	Name	District	Settlement	Coodrinates	
				N	E
26	School	Goychay	Garabaggal	40°38'4.00"N	47°48'12.00"E
27	Mosque	Goychay	Garabaggal	40°37'45.00"N	47°47'50.00"E
28	White Dom	Aghsu	Garagoyunlu	40°33'11.79"N	48°17'44.76"E
29	Cemetery	Aghsu	Garagoyunlu	40°33'11.00"N	48°17'44.00"E
30	Red Dom	Aghsu	Garagoyunlu	40°32'3.16"N	48°18'25.48"E
31	Cemetery	Aghsu	Dashdemirbayli	40°32'21.59"N	48°26'0.21"E
32	School	Aghsu	Gegeli	40°31'57.00"N	48°29'36.00"E
33	Reservoir	Aghsu	Langabiz	40°28'55.00"N	48°35'13.00"E
34	Mosque	Aghsu	Langabiz	40°28'33.00"N	48°34'32.00"E
35	Cemetery	Aghsu	Langabiz	40°28'28.00"N	48°35'25.00"E
36	Cemetery	Aghsu	Baghirli	40°27'43.00"N	48°36'19.00"E
37	School	Aghsu	Baghirli	40°27'11.00"N	48°35'33.00"E
38	Cemetery	Aghsu	Ovchulu	40°27'0.00"N	48°35'46.00"E
39	School	Shamakhi	Ovchulu	40°26'34.00"N	48°36'10.00"E
40	Cemetery	Shamakhi	Chol Goylar	40°25'47.00"N	48°36'58.00"E
41	Cemetery	Hajigabul	I Udulu	40°13'12.00"N	48°47'41.00"E
42	Cemetery	Hajigabul	Mughan	40° 8'41.00"N	48°51'23.00"E
43	Cemetery	Hajigabul	Gizilburun	40° 0'5.00"N	49°13'37.00"E

Out of the objects identified, the following are situated within the nearest proximity and in some cases inside of the OHL rights-of-way:

1. Yevlakh district:
   - Cemetery of Aksham village– southern edge of the OHL corridor
   - Mosque of Aksham village – 220 m to the south of OHL corridor
   - Aksham village school – situated on a relatively straight village street (earth road), which can be used as secondary access road
   - Cemetery of Gulovsha village – area between two OHLs
2. Aghdash district:
   - Old cemetery with 1 medieval gravestone in the outskirts of Hushun and Kukal villages – on the OHL corridor
3. Goychay district:
   - Goychay cemetery – southern flange of OHL corridors
4. Aghsu district:
   - Dashdemirbeyli cemetery – 100 m to the north of OHL corridors

- Langabiz mosque – situated on Aghsu-Hajigabul road, which will be used as the main access road of the Project
- Secondary school of Baghirli village - situated on Aghsu-Hajigabul road
- Baghirli cemetery - situated on Aghsu-Hajigabul road

5. Shamakhi district:
   - Secondary school of Ovchulu village - situated on Aghsu-Hajigabul road
   - Chol Goylar cemetery - situated on Aghsu-Hajigabul road
6. Hajigabul district:
   - Two active XIX-XX century cemeteries on OHL corridors, where people from previously resettled settlements continue burial ceremonies
   - Gizilburun cemetery – situated 100 m to the north of OHL corridor.

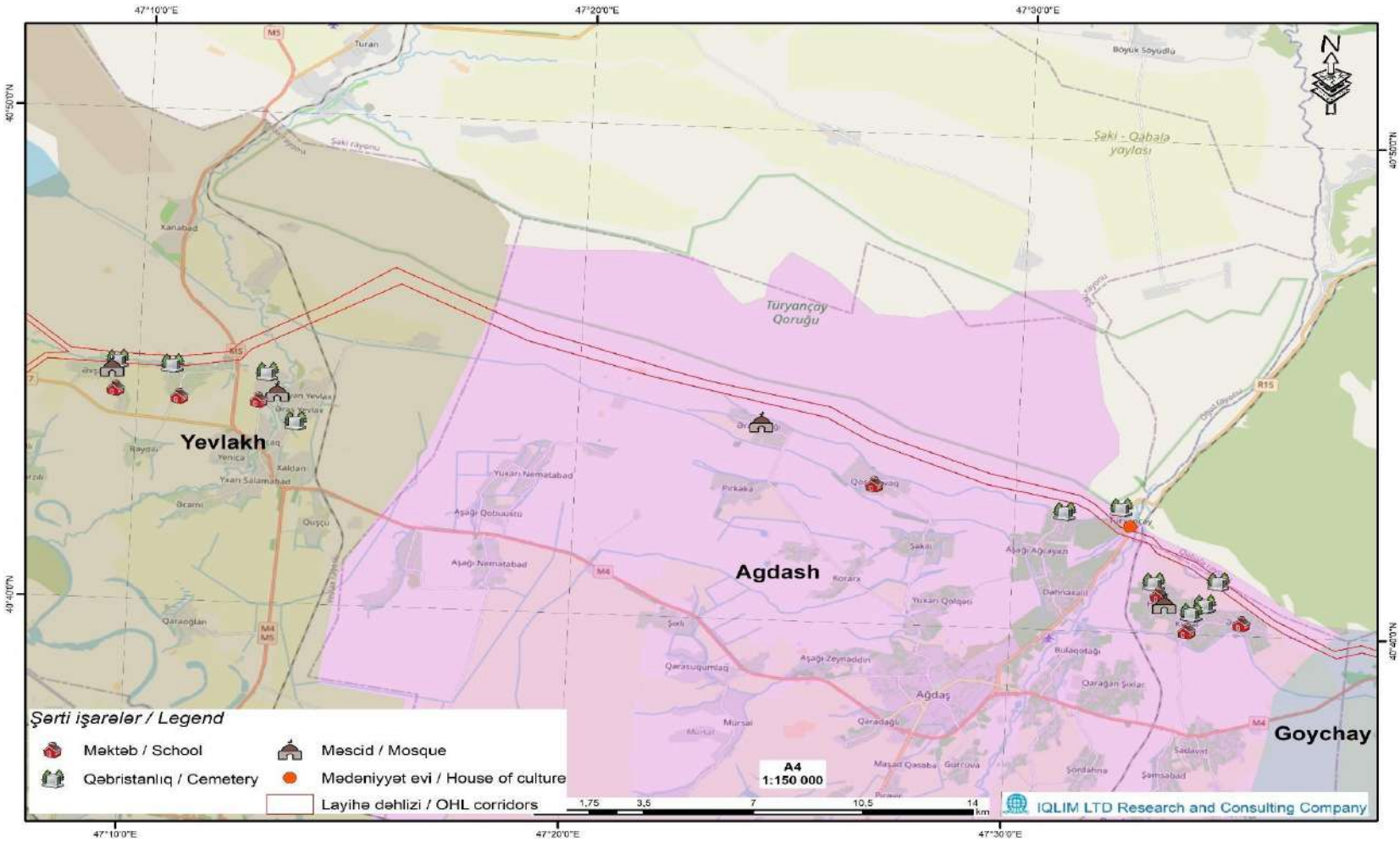


Figure 7.31: Location map of Cultural and spiritual objects identified in the direct impact area of the Project: Yevlakh and Aghdash

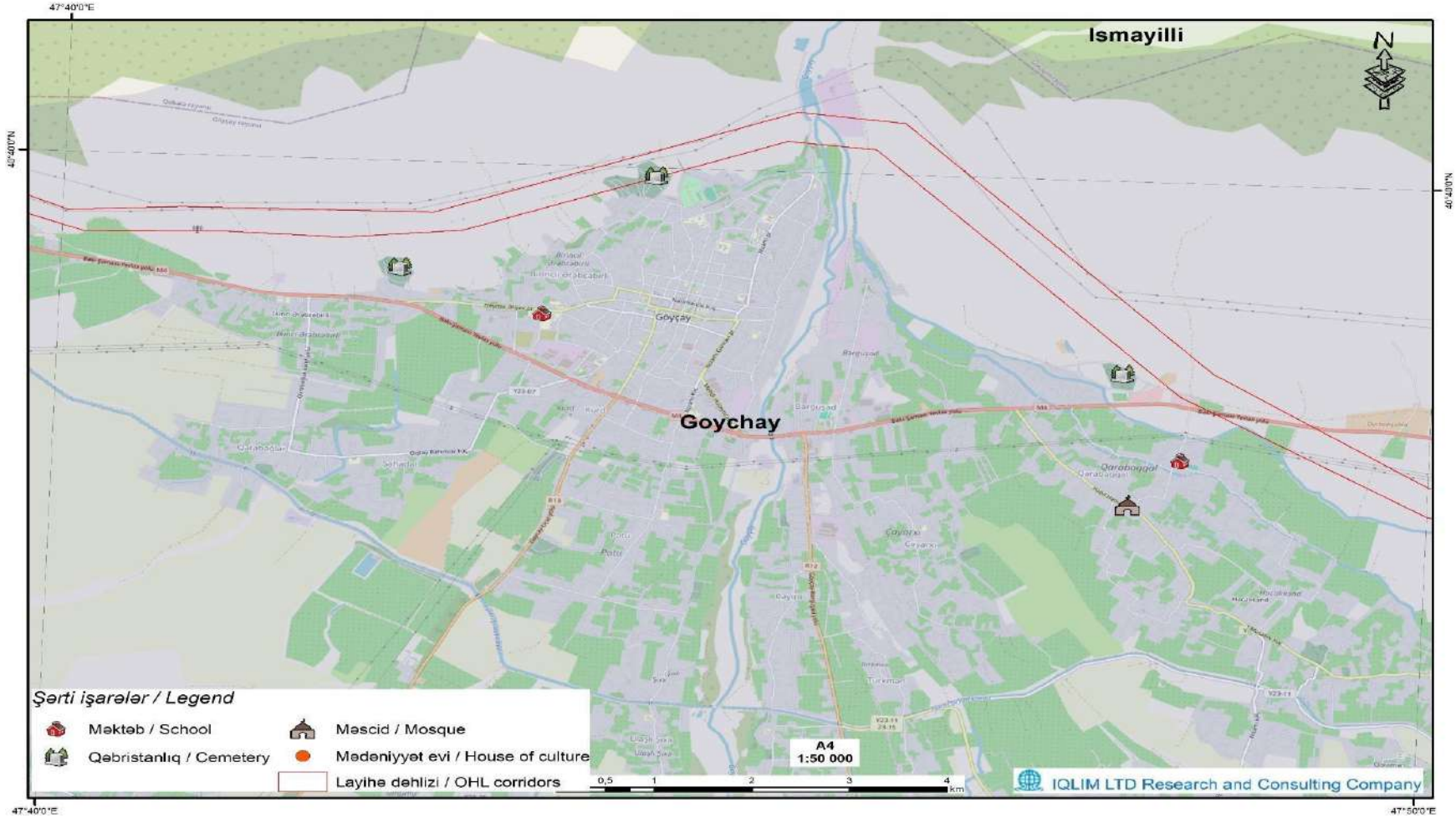


Figure 7.32: Location map of Cultural spaces identified in the direct impact area of the Project: Goychay

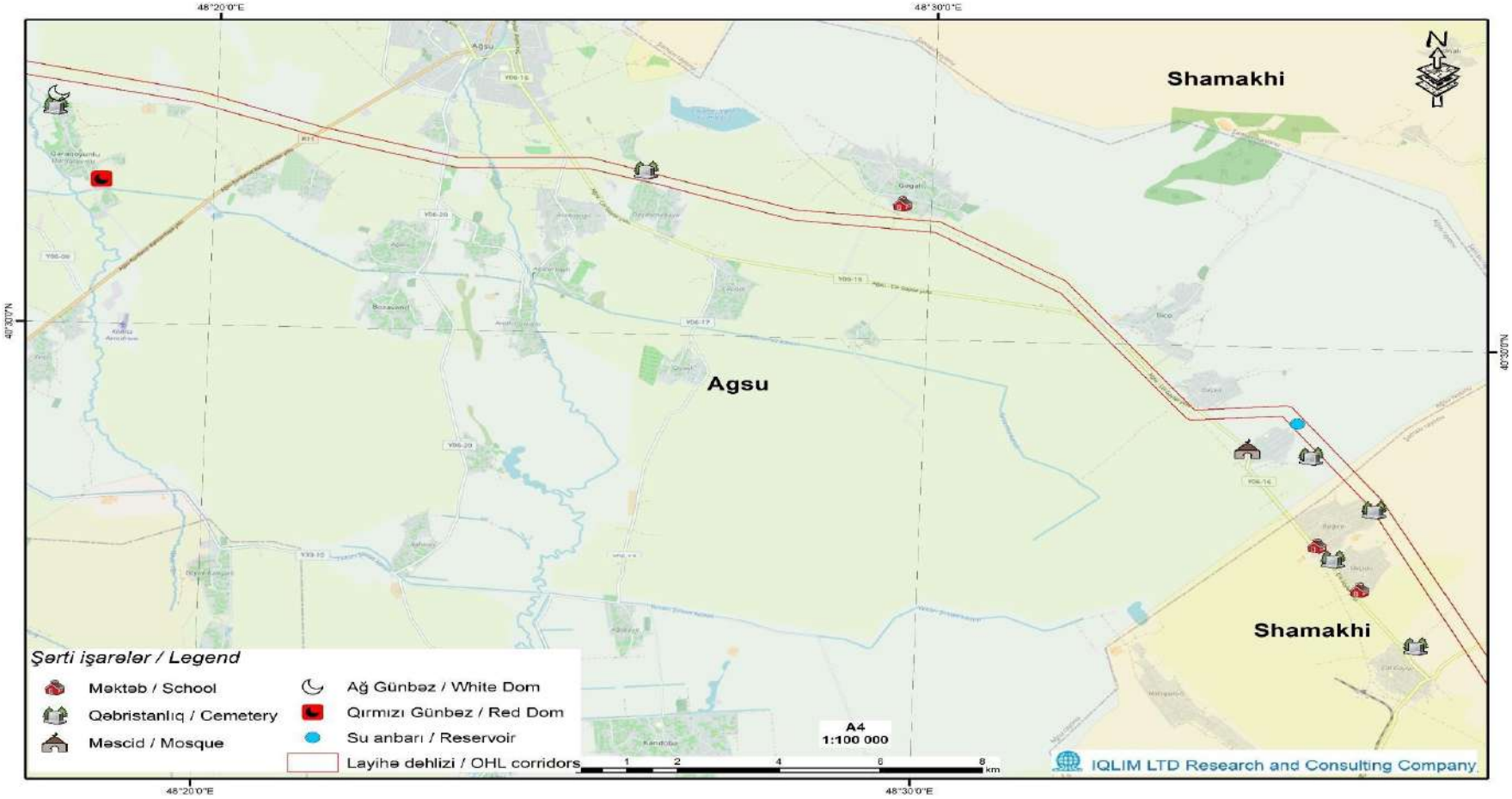


Figure 7.33: Location map of Cultural spaces identified in the direct impact area of the Project: Aghsu, Shamakhi

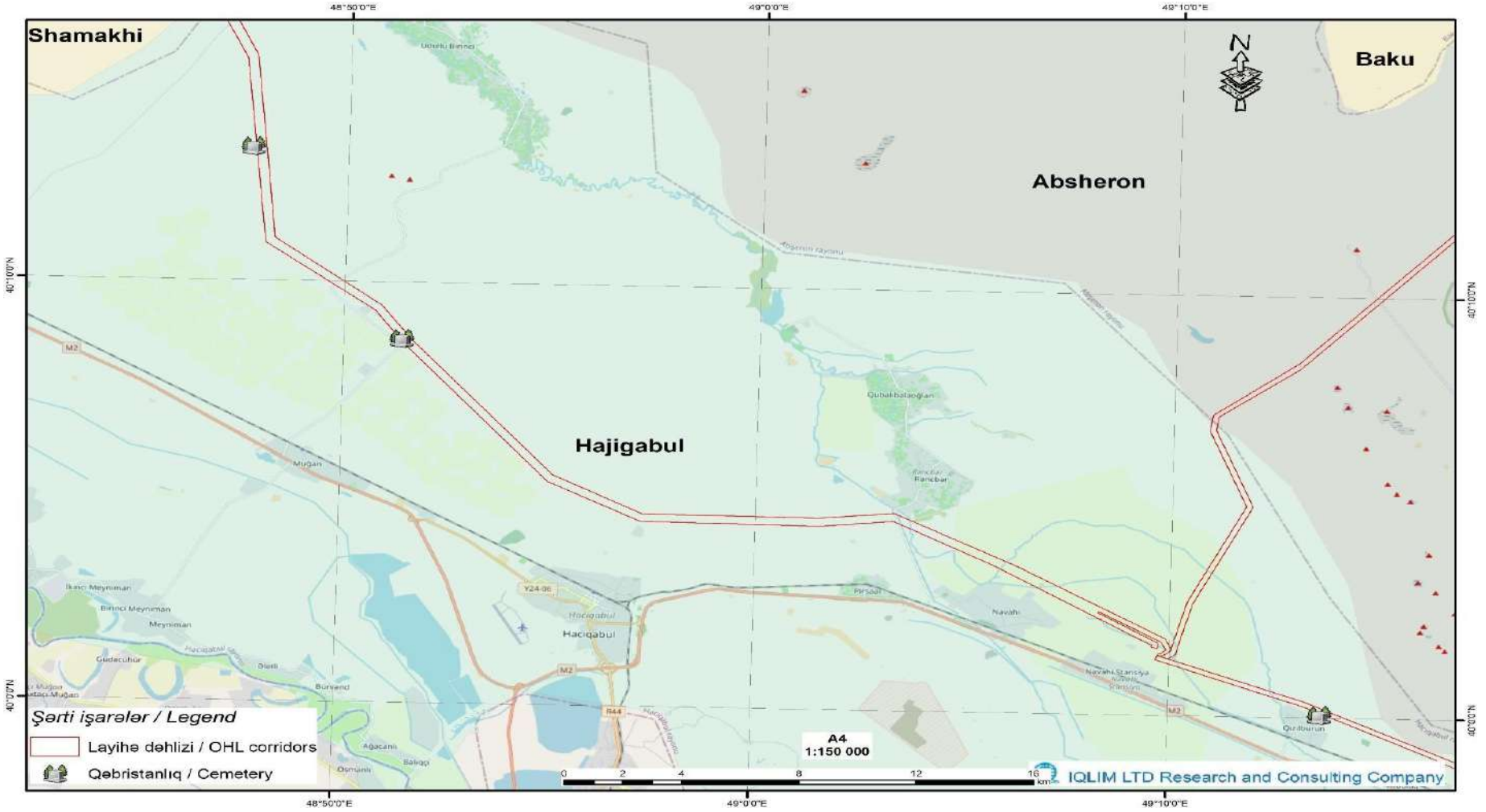


Figure 7.34: Location map of Cultural spaces identified in the direct impact area of the Project: Hajigabul

8. STAKEHOLDER ENGAGEMENT

8.1. Stakeholder Engagement During ESIA Process

8.1.1. Scoping

During scoping phase Azerenerji contacted with the following government agencies to inform the scoping process:

- Letter was sent to State Ecological Expertise Agency (SEEA) of MENR for discussing the Scoping Report content and TOR for ESIA
- A meeting was held with deputy chairman of SEEA and relevant staff where the scoping report content and routes of OHLs presented to the audience and raised questions were answered accordingly by PIU staff
- Letter was sent to the State Land and Cartography Committee (SLCC) with the request of submission cadastral information with regard to land ownership status along the proposed alignments of 8 OHLs covered by the Project.
- Letter was sent to the State Land and Cartography Committee (SLCC) with the request of submission new format (national) land title document for assigned territory of Navahi substation based on old soviet type land title document issued to Azerenerji JSC in 1980s for construction of nuclear power station.
- A meeting was held with the management of SLCC to discuss the alignments and establish priorities for submission of information requested for the Project's OHLs
- Letter was sent to the Chief of State Service for Protection, Development and Restoration of Cultural Heritage under the Ministry of Culture with request of submission of available data and list of cultural heritage objects along the proposed routes of OHLs
- Azerenerji applied to State Agency on Protection of Strategical Objects for obtaining technical conditions for crossing the railway lines by OHLs across the Project covered regions. The respective technical conditions were provided by the Agency and transferred to the design team for consideration in design of OHLs
- Azerenerji applied to State Agency on Protection of Strategical Objects for obtaining technical conditions for crossing the railway lines by OHLs across the Project covered regions. The respective technical conditions were provided by the Agency and transferred to the design team for consideration in design of OHLs
- Azerenerji applied to State Agency on Water Reserves for obtaining technical conditions for crossing the river and channels by OHLs across the Project covered regions. The respective technical conditions were provided by the Agency and transferred to the design team for consideration in design of OHLs
- Azerenerji applied to Azerbaijan Railways CJSC for obtaining technical conditions for crossing the railway lines by OHLs across the Project covered regions. The respective technical conditions were provided by the Azerbaijan Railways CJSC and transferred to the design team for consideration in design of OHLs

- Azerenerji applied to SOCAR for obtaining technical conditions for crossing the oil and gas pipelines by OHLs across the Project covered regions. The respective technical conditions were provided by the SOCAR and transferred to the design team for consideration in design of OHLs
- Azerenerji applied to BP for obtaining technical conditions for crossing the oil and gas pipelines by OHLs across the Project covered regions. The respective technical conditions were provided by the BP and transferred to the design team for consideration in design of OHLs
- A meeting was held with chairman of Navahi village municipality to inform the construction of Navahi SS/associated OHLs and discuss their concerns, collect baseline data

For "The Project" there have been different levels of engagement activities in place and for a set of overlapping purposes, including scoping. The engagement for the GoA aspects of the Project, as per national EIA and Land Acquisition requirements, have covered some areas that are common to both the GoA as well as Azure components. As such four community meetings have been held in the Navai village of Hajigabul Region, and Salyan Region. Another set of meetings were held in Bilasuvar and Neftchala Regions.

The one conducted in Hajigabul Region covered villages from other sub-Project (mutual sections). While this mutual was for EIA and land acquisition purposes it also covered impact and issues that are relevant for the scoping.

Online meetings were held with the participation of village-level municipality and executive representatives from six other Regions - Aghsu, Goychay, Yevlakh, Aghdash, Shamakhy, Ismaiylly and one town of Mingachevir - covered by the Azure Project, with the participation of Iglim Consultancy, which is working on the preparation of the ESIA for the Azure Project. Basic demographic information, including key socio-economic data, was collected from the participants. Minor discussions on the issue of vulnerabilty in each village, the criteria for identifying vulnerability according to national procedures and local considerations, and the number of vulnerable people per village were obtained from the participants.

In terms of direct engagement with the local community there has been limited communication. The method followed was for a team of land surveyors (topographic investigation) to follow the alignments of the OHLs. They took photographs of the areas and some limited communication with landowners/land holders. Focused engagement with impacted communities take place in early October 2024.

The scoping report was presented to SEEA and MoC and their recommendations and feedback were collected with their due reflections in the scoping report. Particularly, as per the request of MoC the alignment of Navah-Mingachevir OHLs were shifted to ensure safe distance from Aghsu Medieval Archaeological Tourism Complex. The disclosure of Scoping Report to MENR also resulted with rerouting of Banka-Navahi OHL that was initially designed through Shirvan National Park.

Public consultations were held in the villages crossed by the project and in the town of Mingachevir from 30 September to 2 October. The purpose of the consultations was to disclose the Scoping Report, RPF, SEP and LMP to the project traversed communities, to share positive impacts of the Project, address the concerns of the people regarding the possible risks and mitigation measures, to answer their questions,

to inform about the ongoing studies under the ESIA, etc. A summary of the consultations is provided in Annex 10.

8.1.2. To Inform Baseline

With time constraints of the environmental and social baseline studies taken into account, stakeholder engagement process during the baseline studies was limited to conducting to the following activities:

1. Interviews with local EA and municipality representatives – July-August 2024. During the interviews, data obtained during the initial scoping studies was updated and more community-specific baseline information was produced. The studies resulted in the development of ESIA paragraphs dedicated to the community-level socioeconomic baseline (Chapter 7.6).
2. Focus group consultations in a number of key settlements falling within the Project AoI – September-October, 2024. The consultations helped identify specific concerns of the Project affected communities via engaging them in proactive discussions of the Project plans and ESIA process. Summary of the conducted consultations is provided in the Annex 11.

8.1.3. Disclosure and Consultation on ESIA

During the ESIA phase, Azerenerjı conducted stakeholder engagement activities from 30 September to 2 October 2024 in 34 cluster communities affected by the project, covering 7 regions of Hajigabul, Agsu, Agdash, Shamakhi, Goychay, Agdash, Ismayilli and 1 Mingachevir town. The AZURE Project ESF Documents (Scoping Report, Resettlement Policy Framework, Stakeholder Engagement Plan and Labour Management Procedures) that describe potential socio-environmental impacts of the Project activities and corresponding mitigations were disclosed to the stakeholders. The comments and feedback received from stakeholders were incorporated into the final versions of ESF documents.

The consultant (Iglim) preparing the ESIA for the AZURE project conducted focus group consultations with members of the AoI community, from 30 September to 2 October 2024 and provided information on the AZURE project, its positive impacts, as well as potential environmental and social risks and mitigation measures. People's perceptions of the project, its benefits and risks were collected through specific pre-prepared focus group consultation questionnaires. The consultations helped identify specific concerns of the Project affected communities via engaging them in proactive discussions of the Project plans and ESIA process.

ESF documents published on the official Azerenerji website https://www.azerenerji.gov.az/azureproject in August 2024 and republished in January 2025, upon the revisions.

Azerenerji conducted stakeholder engagement activities during 5-7 February 2025, in project affected regions to disclose the draft ESIA and ESIA Non-Technical Summary (NTS) to the community representatives. During consultations, the potential environmental and social impacts and mitigation measures, labor and working conditions, measures during emergency cases, ornithological studies and conservation of biodiversity, environmental and social management plans and monitoring plans were communicated to the people and comments and feedback of the participants were responded.

The draft ESIA and draft ESIA NTS was published on the official Azerenerji website in January 31 2025, and the final version will be republished by the end of February 2025.

Pending the approval of the final draft of the ESIA, AzerEnerji will undertake the following activities to ensure stakeholder engagement during ESIA disclosure process:

- Making the ESIA report and other ESF documents available in Azerbaijani language and user-friendly formats (e.g., executive summaries, brochures, online platforms) by the end of February 2025. The documents will be developed using clear and concise language, avoiding technical jargon.
- Ensuring that stakeholders have access to the information by using various channels including national and regional offices of AzerEnerji, websites of AzerEnerji and WB, public notices, local media, and community centers by the end of February 2025.
- Organization of public consultations for ESIA disclosure with the involvement of wide range of stakeholders, including PAPs, local self-governance institutions, executive authorities, regional and national government organizations, local and regional private businesses, NGOs, CBOs, research institutions and media within the first decade of February. Consultations will be organized in the AZURE Project traversed regions.
- Based on consultation outcomes, considering and incorporation of the stakeholder feedback into project design and mitigation measures where feasible.
- Communicating project decisions to stakeholders, explaining how their feedback was considered and any resulting changes to the project.
- Upon completion of additional studies on autumn and winter bird migration, the ESIA will be updated accordingly and communicated to the project community during community consultations.

8.2. Stakeholder Engagement During Project Implementation

Stakeholder engagement will remain crucial throughout the entire Project lifespan, being an important tool to ensure the Project's success and minimize its' negative impacts. The following activities will be implemented by AzerEnerji and its' contractors during construction and operation phases of the Project:

- Informing affected communities and landowners about construction schedules and potential disruptions (e.g., traffic, noise, dust), providing them with contact information for addressing concerns and complaints
- Ensuring transparency of the land acquisition process run in compliance with RFP, RAP and applicable national/international regulations
- Negotiating access agreements with landowners and ensuring minimal disruption to their activities during the construction works
- Implement measures to minimize impacts on land use, such as temporary fencing and restoration of disturbed areas

- Monitoring environmental and social performance of the Project and regular reporting the compliance to the stakeholders
- Maintaining open communications with affected communities and stakeholders, addressing any concerns or grievances promptly
- Providing regular updates on construction progress and timely addressing of any emergency issues
- Holding regular meetings to provide updates, address concerns, and gather feedback
- Organizing site visits for stakeholders to observe construction activities and understand mitigation measures.
- Seeking and addressing feedback from the affected communities and other stakeholders on the Project's overall impact, identifying any areas for improvement.
- Using recieved feedback to inform future Projects and enhance stakeholder engagement practices.
- Establishing information centers in the affected communities to provide access to project information and address questions.
- Setting up hotlines and email addresses for stakeholders to report concerns or complaints.
- Using online platforms to share project information and updates.
- Distributing printed materials to provide information.
- Ensuring that all stakeholders have the opportunity to participate in the engagement process.

8.3. Grievance Management

AzerEnerji will create Grievance Redress Mechanism (GRM) for the Project. The purpose of GRM is to demonstrate responsiveness to stakeholder needs. Key elements of the Project GRM will include:

Clear instructions on how grievances are submitted and handled after submission, including a minimum period that a stakeholder must wait to receive a reply; and

Alternatives for submitting a grievance in person to a staff member if a stakeholder is not able to or comfortable submitting a grievance in writing.

The Steps to be followed to address grievance within the SEP framework as per ESS10 requirements are as follows:

Step 1 Grievance Redress Commission (GRC): In conformance to ESS10 Annex 1 par 2 (a), the GRM will be accessible to the full range of project stakeholders, including project-affected parties, community members, civil society, media, and other interested parties. Stakeholders can use the GRM to submit complaints, feedback, queries, suggestions, or even compliments related to the overall management and implementation of the project. The GRM is intended to address issues and complaints from external stakeholders in an efficient, timely, and cost-effective manner. A separate mechanism will be used for worker grievances. The Azerenerji-PIU will be responsible for managing the stakeholder GRM following the roles and responsibilities outlined in the previous section.

A GRC will be formed by Azerenerji-PIU at the local level which shall consist, as a minimum, of representatives from: (i) the affected people, through recognized local leaders (e.g., officials of local executive power); (ii) the Contractor; (iii) Supervision Engineer (OE), to represent Azerenerji-PIU). The GRC will act as the mediator between aggrieved parties and will make efforts to resolve conflicts through mutual consent. The management of uptake channels can be delegated to PIU's SES, and later on a staff of the OE who can log in grievances received verbally (personal appearance, or phone), on-paper (documentary or traditional mail), or electronically (e-mail, website, WhatsApp, etc.). The contact details of uptake channels shall be made known to the stakeholders. Resolution steps will entail inspection, steaming the item logged to determine that it fulfils the status of "grievance", review, assessment of grievance, internal GRC deliberations, discussions with complainant, compromise and arriving at decisions. This process will be managed by SES. This step will have a time frame of 7-10 days.

Step 2 Azerenerji-PIU: Recommendations of the GRC are sent to the Azerenerji-PIU. The Azerenerji-PIU is responsible for addressing the grievances and if necessary, will forward these grievances to appropriate agencies/ offices for taking action. The person/organisation logging the grievance will be able to contact the Azerenerji-PIU through phone, email, direct meetings and letters. The contact details of Azerenerji-PIU (Point of Contact) will be distributed to the stakeholders and posted on the main locations in the communities before the commencement of AZURE implementation. In addition, in case of unresolved issues, the Azerenerji-PIU may resort to "mediation" by engaging SES as an option (ESS10 Annex 1 par 3). This step will have a time frame of 15 days.

Step 3 (Court of law): The court of the law will be the last resort. In principle, the aggrieved Parties can appeal to a relevant court anytime they disagree with the activity or inaction of the Project Implementors. However, the Project-specific GRM will be implemented fully and transparently in order to avoid complaints being escalated to the judicial level. Having said that, PAPs can apply to court if they disagree with the final decision of GRM. This step will have a time frame as indicated in Civil_Procedural Code of Azerbaijan Republic.

9. IMPACT ASSESSMENT

9.1. Introduction

Potential environmental and social impacts that may occur during all phases of the Project have been identified in this chapter and measures to prevent or mitigate them have been proposed. The chapter describes the impact assessment methodology used, including the approach adopted in selecting impact assessment criteria.

The standard on Assessment and Management of Environmental and Social Risks and Impacts (ESS1) requires to:

- Identify, assess, evaluate, and manage environment and social risks and impacts;
- Adopt a mitigation hierarchy that 1) will anticipate and avoid risks and impacts; 2) where avoidance is not possible will minimize or reduce risks and impacts to acceptable levels; 3) once risks and impacts have been minimized or reduced, will mitigate; and 4) where significant residual impacts remain, will compensate for or offset them, where technically and financially feasible;
- Adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable
- Utilize national environmental and social institutions, systems, laws, regulations and procedures where appropriate;
- Promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity

9.1.1. Geographic coverage

Geographical scope of the impact assessment corresponds to the coverage area of the environmental and socioeconomic baseline studies. This primarily includes 200 m wide corrdors around OHLs, and 500 m wide safety (buffer) zones around the substations. Depending on type of an impact source and an impact receptor, the scope occupies wider areas to cover the impact distribution limits.

The current assessment covers the impacts that may arise during the construction and operation phases of the AZURE Project.

9.1.2. Impact Sources, Receptors and Magnitudes

9.1.2.1. Impact sources

Within the assessment framework, the following main source categories of the project related impacts were identified:

1) Construction activities of OHL and other power transmission facilities;
2) Vehicles and equipment deployed during the construction works implemented as part of the Project;
3) Fuel combusted by the vehicles and equipment during the construction and operation phases of the project;

4) Operation of OHLs and other transmission facilities.

9.1.2.2. Environmental receptors

Studies conducted within the ESIA framework had covered the following categories of impact receptors from the following areas:

- Climate
- Air quality
- Noise and vibration
- Geological environment and mud volcanism
- Land quality and land use
- Surface and underground waters
- Biological diversity
- Landscape visual perception
- Ecosystem services

The ESIA covered receptors have been classified according to their importance and sensitivity level. The importance of a receptor have been determined taking into consideration the features such as its ecological, economic, social and cultural value, rarity, benefits and the ecosystem services they offer. Receptor sensitivity has been determined on the basis of the potential to resist or adapt to the project-borne impacts. A brief classification of the importance and sensitivity levels of impact receptors is given in the Table 9.1 below:

Table 9.1. Receptor importance and sensitivity

Importance / Sensitivity degree	Example of importance	Example of sensitivity
Very high	Receptors with high value and rarity at the international, regional and national levels, with low or zero replacement potential	Sensitive receptors with low resistance and adaptability to adverse impacts
High	Receptors with high value and rarity at the local level, with low or zero replacement potential Receptors with average value and rarity at the regional level, with limited replacement potential	

Moderate	Receptors with limited replacement potential, featured by their moderate value and rarity at the regional level	Receptors with moderate level of resistance and adaptability
Low	Receptors with limited replacement potential, featured by their moderate value and rarity at the local level	Receptors with high resistance and adaptability to adverse impacts

Identified potential environmental impacts were classified by the following criteria:

By type:

- Direct impacts that are an integral part of the project and arise from the activities implemented under the Customer's supervision;
- Indirect impacts that do not explicitly form an integral part of the Project and do not necessarily arise from the activities implemented under the Customer's supervision.

By duration:

- Short-term impacts lasting for several days or weeks;
- Midterm impacts lasting for several weeks or months;
- Long-term impacts lasting for several months or years.

By spread:

- Localized impacts spread over a very small area;
- Local impacts spread over a limited area;
- Widespread impacts spread over larger areas.

By probability:

- Impacts with very low probability of occurrence;
- Impacts with low probability of occurrence;
- Impacts with moderate probability of occurrence;
- Impacts with high probability of occurrence.

The impacts assessed according to the above criteria have been classified as impacts of negligible, low, moderate and high magnitude, and their degree and mitigation methods have been determined in advance by conducting modelling and specialized studies.

Assessment of potential environmental impacts and the effects they would generate has been conducted separately for each environmental component and reflected in the relevant subsections. The assessment was conducted using research, modelling and comparative analysis methods based on the scheduled project activities, relevant legal requirements, international experience gained during the implementation of similar projects, as well as summary of discussions with the stakeholders.

9.1.2.3. Social receptors

From the SIA viewpoint, the term "Sensitive Receptor" means individuals, groups of people, local communities, individual and collective entrepreneurs, as well as other stakeholders that are highly sensitive to direct and indirect, cumulative and residual, positive and adverse socio-economic impacts of the Project. The following types of impact receptors have identified under this Assessment:

- Workers of AzerEnerji and its' subcontractors implementing Project related and other activities in the Project area
- Residents of 35 settlements located close to the Project area
- Local farmers and other stakeholders implementing activities along OHL corridors and around station safety zones
- People from the other parts of the project affected districts and remaining Azerbaijan, including end users of the produced energy resources and those who visit the Project area, especially historical monuments and protected nature areas
- Historical heritage sites located along the OHL corridors
- Users of the Project area's road infrastructure.

In general, the potential for impacts of construction and operation phases on communities and community members is related to the distance that people live from the transmission line. The below table shows the villages/settlements located within certain distances of the transmission lines.

Table 9.2. Shortest distances between AoI settlements and the Project facilities

Settlements by regions and their vicinity to sub-projects			
Regions	**Settlement**	**Population in 2022**	**Shortest distance**
Construction of 500 kV single-circuit "Navahi SS – Azerbaijan TPP" OHL - 235 km			
Hajigabul	Ranjbar	3700	700 m
	Pirsaat	1200	700 m
Aghsu	Langabiz	10000	500 m
	Goylar	1500	500 m
	Bico	2000	500 m
	Gəyəli	3500	500 m
	Garagoyunlu	1400	500 m
Ismayilli	Gubakhalilli	2500	1,7 km
Goychay	Garamaryam	2500	500 m

Settlements by regions and their vicinity to sub-projects			
Regions	**Settlement**	**Population in 2022**	**Shortest distance**
	Garabaggal	3500	1,2 km
	Mirzahuseynli	1000	1 km
	Arak	1000	1 km
	Hushun	1000	1 km
Aghdash	Yukhari Aghjayazi	700	1 km
	Goshagovag	1100	1 km
	Arabojagi	1200	1 km
Yevlakh	Arash	700	1,5 km
	Yukhari Bujag	1000	1 km
	Gulovsha	1000	200 m
	Aksham	700	100 m
Mingachevir town	Mingachevir town	110000	500 m
Construction of 330 kV double-circuit "Alat FEZ SS - Navahi SS" OHL - 22 km			
Hajigabul	Navahi	3000	1200 m
	Gizilburun	500	1 km
	Atbulak	500	1,5 km
	Garakosa	1000	1,5 km
Garadagh	Alat	15000	2 km
Construction of 330 kV single-circuit "Absheron-Garadagh WPP - Navahi SS" OHL - 60 km			
Hajigabul	Navahi	3000	1200 m
Gobustan	----		
Construction of 330 kV single-circuit "Absheron-Garadagh WPP - Gobu ES" OHL - 19 km			
Gobustan	----		
Absheron	Gobu	15500	3 km

Settlements by regions and their vicinity to sub-projects			
Regions	**Settlement**	**Population in 2022**	**Shortest distance**
Total		240000	

Detailed information on the demographic composition and current socio-economic status of these sensitive recipients is presented in “Chapter 8. Socioeconomic Baseline”.

Sensitive impact receptors covered by the current SIA were characterized by the degree of exposure and sensitivity to the socio-economic impacts arising from the Project activities. Exposure levels of the receptors were assessed based on the distance between the living or working place of the recipient and the potential impact sources. Receptor sensitivity levels were established based on the degree to which well-being and economic activities, customs, health, education and other parameters of the identified receptors may potentially change as a result of the Project impacts. Brief classification of the exposure and sensitivity levels of the impact receptors is presented in the Table 9.3 below:

Table 9.3. Impact / sensitivity degree of receptors

Impact / sensitivity degree	Description of degree	Example
Very high	Receptors living or engaged in economic activities in the immediate vicinity of the Project area	Sensitive receptors with low resistance and adaptability to adverse impacts
High	Receptors living relatively far from the Project area and engaged in nearby economic activities in the neighbourhood	
Moderate	Receptors who visit the project area periodically and are engaged in economic activities there	Receptors with moderate resistance and adaptability to adverse impacts
Low	Receptors who visit the project area periodically and are not engaged in economic activities there	Receptor with high resistance and adaptability to adverse impacts

9.1.3. Mitigation Measures

The following types of mitigation measures have been proposed with regards to the identified impacts:

1. Impact prevention - making changes to the Project plan and location in order to prevent adverse environmental impacts completely;
2. Impact minimization - minimization of adverse effects of the impacts, if preventive measures would be ineffective;
3. Rehabilitation – in case the implementation of preventive and minimization measures is impossible, the return of the impact receptor to its natural state upon completion of the relevant project activity;
4. Compensation - in case implementation of measures to prevent or minimize the impact is impossible, replacement of any adverse side effect with any positive action;
5. Improvement – Making efforts to further increase effects of the positive impacts.

9.1.4. Cumulative Impacts

Possible cumulative impacts were assessed based on data on the operated facilities of AzerEnerji that exist in the Project area. Where applicable, effect of the present and past project impacts were combined by using mathematical calculations, spatial analysis and modelling methods.

9.1.5. Residual Impacts

Residual impacts that will remain upon the implementation of impact management activities have been identified by applying methods of identifying and assessing the major impacts, and proposals for their management have been prepared.

9.2. Air Quality

9.2.1. Scope of assessment

The project, especially its construction phase, anticipates activities that will result in the emission of particulate matter and various hazardous gases. This section analyses the assessed impact of project-related emissions on ambient air quality parameters and proposes corresponding mitigation and minimization measures. Geographical scope of the air impact assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations. The assessment period covers both the construction and operation phases of the project. The following tasks were performed as part of the assessment:

1. Identification of potential impact sources associated with project activities
2. Quantitative and qualitative assessment of the adverse air emission impacts of the Project against sensitive receptors
3. Identification of ways to prevent or minimize the adverse impacts arising from the Project activities.

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in the pre-Project

air quality parameters and sensitive receptors (described in "5.7. Meteorology and climate" and "5.8 Ambient air quality" sections of the ESBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.2.2. Sources and sensitive receptors

The assessment had identified the following main sources and types of adverse air quality related impacts of the Project:

9.2.2.1. Construction phase:

- Emissions of dust and particulate matter during movement of vehicles, land clearing, excavation, transportation, unloading and installation of construction materials and equipment;
- Emission of pollutants and greenhouse gases by the vehicles used in the construction works
- Release of VOCs and other pollutants during concrete mixing, painting, and welding (fugitive emissions)
- Release of smoke during burning of vegetation (accidental or planned) during land clearance activities.

9.2.2.2. Operation phase:

- Emissions of dust, particular matter and hazardous gases
- Emission of pollutants and greenhouse gases by the vehicles during maintenance operations
- Releasee of smoke as a result of wildfires caused by possible malfunctioning of the high-voltage facilities
- Corona discharge – release of small amounts of ozone and nitrogen oxides under certain weather conditions

Sensitive receptors of the above impact types were identified as follows:

- Ambient air resources
- Biodiversity/ecosystems
- Local staff of AzerEnerji and its' subcontractors engaged in the construction and maintenance of the Project facilities
- Residents of the nearby houses, farmers and other people working around along the Project facilities.

Sensitivity level of the receptors was assessed as high for workers, local farmers and ecosystems, moderate for the nearby but still sufficiently remote houses, and low for the ambient air.

9.2.3. Project standards and evaluation criteria

A. Air quality

In evaluating potential air quality impacts throughout the project lifecycle, this assessment utilized the Project Environmental and Social Impact Assessment (ESIA), the Project Feasibility Study, relevant domestic and international legal frameworks, and dispersion modelling for both gaseous pollutants and dust. The ambient air quality standards accepted for the Project in line with WB ESS3 and based on the EU[83] and Azerbaijan[84] standards are given in Table 9.4.

Table 9.4. Ambient air quality standards

Pollutant	Time interval	MACs		
		EU	Azerbaijan	Project
SO2 (mg/m3)	Hour	0.35	-	0.35
	day	0.125	0.03	0.03
	Annual / seasonal (October-March) - for ecosystems	-	0.02	0.02
NO2 (mg/m3)	hour	0.2	0.08	0.08
	year	0.04	-	0.04
PM10 (mg/m3)	day	0.05	-	0.05
	year	0.04	-	0.04
PM2.5 (mg/m3)	year	0.025	-	0.025
Dust sediments (mg/m3)	day	-	150-500	300
Ozon (mg/m3)	8 hour	0.12	0.16	0.12
Metals[85]*				
Lead (Pb) (mg/m3)	il	0.0005	0.0002	0.0002
Arsenic (As) (ng/m3)	il	6	-	6

83 Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air for Europe and National Regulation
Regulation on Control of Industrial Air Pollution (dated: 03 July 2009, Official Gazette No: 27277)
84 Maximum allowable concentrations of toxic elements in the workplace GOST 12.1.005-88; Azerbaijan MEHR, 2003
85 Directive 2004/107/EC

Pollutant	Time interval	MACs		
		EU	Azerbaijan	Project
Cadmium (Cd) (ng/m3)	il	5	-	5
Nickel (Ni) (ng/m3)	il	20	-	20

* MACs for heavy metals are given based on the contents in annual concentration of PM10 particles of those metals.

B. Dust and particulate matter

The following formula was used to model the dust levels to be generated as part of the project:

- generated dust level = production tonnage x emission level
- Generated dust emissions have been calculated based on the emission factors given in the Table 9.5 below.

Table 9.5. Dust emission factors

Source of emissions	improvident *	Subject to measures **
Emissions during excavation	0.025 kg / ton	0.0125 kg / ton
Emissions during loading / unloading	0.010 kg / ton	0.005 kg / ton
Emissions during transportation	0.7 kg / trip	0.35 kg / trip

* Emissions generated resulting from works with a maximum power of 8,760 hours per year

** Emissions generated resulting from works with a maximum power of 8,760 hours per year subject to pollution control

C. Pollutant gases. The method for calculating pollutant gas emissions is presented in the Table 9.5.

D. Greenhouse gases.

The main greenhouse gas emissions in the project area will come from the combustion of diesel fuel in vehicles. These emissions emit carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). According to the IPCC methodology, self-propelled onland vehicles are classified as "Energy activities" as a source of GHG emissions. Therefore, emission calculation factors are those specified in the IPCC Survey Guidelines rather than national factors.

Table 9.6. Calculation coefficients of CO2 formed as a result of fuel combustion

Fuel type	CO2 Emission
Natural gas	1,85 т CO2/(ths м3)
Coal	2,7–2,8 т CO2/t, depending on the type of coal
Peat	~1,5 т CO2/т, t tons of oil, 2 tons less energy than 1 ton of coal.
Fuel oil	3,1 т CO2/r
Car fuel	3.0 t CO2/t or 2.1–2.3 kg CO2/l depending on the brand of fuel and temperature (dense in summer, less in winter)
Diesel fuel	3.15 t CO2 / t or 2,6–2,8 kg CO2 / l depending on fuel brand and temperature (denser in summer and lower in winter)
Aviation kerosene	3,1 т CO2/t

Emissions from vehicles are emissions from the combustion of diesel fuel. The total amount of these emissions in CO2 equivalent is 99%.

9.2.4. Assumptions and limitations

The ambient air impact assessment was implemented based on the following assumptions and limitations:

Assumptions

- Typically, the air quality impacts of the Project will bear a localized and temporary character, primarily occurring near construction/operation sites and access roads.
- Dust control measures (e.g., watering, covering stockpiles) and emission controls on equipment are assumed to be implemented effectively
- The assessment was developed focusing on worst-case scenarios, such as peak construction activity or unfavourable weather conditions.

Limitations:

- Project data on construction activities, equipment usage and emission factors was limited or incomplete

- As there is no detailed reliable data on the available air emission volumes and sources in the Project area, it is impossible to assess cumulative air related impacts of the Project
- Unforeseen events, such as equipment malfunctions and accidents, can lead to unanticipated air quality impacts
- Long-term monitoring of air quality during construction may not be feasible due to resource constraints.

9.2.5. Identified impacts

1. Emissions of dust and particulate matter during movement of vehicles, land clearing, excavation, transportation, unloading and installation of construction materials and equipment.

Emissions from road traffic, movement and unloading of the materials will affect air quality. Depending on wind speed and direction, ambient temperature, and atmospheric stability, emissions can be transported over long distances. Dust generated by the use of earth roads can spread to residential areas.

The health effects of dust vary depending on the origin and size of the particles. Inhalable dust can potentially impact the respiratory system.

Absorbable dust: Particles between 2.5 and 10 microns in size can accumulate in the nose, throat, and upper respiratory tract.

Inhaled dust: Particles smaller than 2.5 microns, including aerosols, can reach the lower parts of the lungs.

Vulnerable receptors who may be more susceptible to the effects of dust exposure include infants and children, older adults, individuals with respiratory problems, individuals with heart disease and individuals with diabetes.

Continuous but stage-by-stage during the construction (construction works will be implemented by sections depending on the construction schedule), and sporadic (conditioned by the maintenance schedule) throughout the operation phase of the project, the impact will potentially have high magnitude, if no prevention and mitigation efforts are undertaken. At the same time, the impact will have a localized effect considering that it will be limited to small erection sites and relatively short access roads of the OHL towers and to the small fenced areas of SS extension sites.

The dust generated will primarily be coarse-grained, limiting airborne duration. US EPA studies indicate that over 90% of such dust settles within 100 meters of the source, and 98% within 250 meters. Therefore, dust pollution during project activities is expected to be short-term and localized86.

2. Emission of pollutants and greenhouse gases from the vehicles

86 United States Environmental Protection Agent (USEPA) AP-42

A primary potential impact of project activities is the atmospheric emission of pollutants and greenhouse gases. The operation of vehicles and equipment releases air pollutants, including Volatile Organic Compounds (VOCs) and nitrogen oxides (NOx), alongside greenhouse gases such as carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).

It is expected that the intensity of the assessed impacts will be relatively high during the construction and low during the operation phases of the Project. As there was no exact data on the vehicle park of the Project by the time the ESIA was developed. Table 9.7 below presents calculated emissions for the worst-case deployment scenario of the vehicles usually used during 6-month lasting construction activities.

Table 9.7. Estimated emission volumes of pollutant and greenhouse gases

Vehicles (Equipment)	Quantity	Parameters of emission sources				NOx indicators		ÜYM göstəriciləri	
		hp.	hour/day	Days of Operation	LF	Nox Em. factor	Nox Em. (tons)	VOC Em. Factor	VOC Em. (tons)
SUV 4WD (JAC/Chevrolet)	5	130	16	180	1	9,2	17,22	1,3	2,43
UAZ 469 4WD or equivalent	14	75	16	180	1	9,2	27,82	1,3	3,93
GAZ 66	3	230	16	180	1	9,2	18,28	1,3	2,58
Bus (KAMAZ)	4	240	16	180	1	9,2	25,43	1,3	3,59
Special purpose vehicle (Kamaz)	2	240	16	180	1	9,2	12,71	1,3	1,79
Mobile Drilling Machine	4	240	16	180	1	9,2	25,43	1,3	3,59
Vibrating devices "AHV-IV-362"	5	425	16	180	1	9,2	56,3	1,3	7,95
Bulldozer	1	300	16	180	1	9,2	7,94	1,3	1,12
Excavator	1	524	16	180	1	9,2	13,88	1,3	1,96
Electrogenerator (GAZ-66)	1	230	16	180	1	9,2	6,09	1,3	0,86

Vehicles (Equipment)	Quantity	Parameters of emission sources				NOx indicators		ÜYM göstəriciləri	
		hp.	hour/day	Days of Operation	LF	Nox Em. factor	Nox Em. (tons)	VOC Em. Factor	VOC Em. (tons)
						NOx Total	211,1	Total VOC	29,8

Horse power/hour: a.g.-hour= number of engines * a.g. * YF * hour/day * operating days.

Load Factors: Load Factor (LF) represents the average percentage of rated horsepower used during a source's operational profile. For this worse case estimate, LF is held at 1 for all equipment. Typical is 0.4 to 0.6.

Emission Factors: NOx Emissions Factor (EF) for Off-Road Construction Equipment is 9.20 g/hp-hr.

VOC Emissions Factor (EF) for Off-Road Construction Equipment is 1.30 g/hp-hr.

Emissions (g) = Power Demand (hp-hr)* Emission Factor (g/hp-hr).

Emission (tons) = Emissions (g) * (1 ton/907200 g)

3. Fugitive emissions

Fugitive emissions during concrete mixing, painting, and welding can also have negative impacts on human health and the environment. The primary VOC released during concrete mixing is methanol, which is used as a set-retarding admixture. Other VOCs may be present in smaller amounts depending on the specific admixtures and sealers used. Concrete mixing can also release dust particles containing crystalline silica, which can cause lung damage if inhaled.

Paints, especially oil-based paints, contain a wide range of VOCs, including toluene, xylene, ethylbenzene, and formaldehyde. These can contribute to respiratory problems, eye irritation, headaches, and other health issues. Some paints may also contain heavy metals like lead or chromium, which can pose serious health risks.

Welding processes can release VOCs like benzene and acetaldehyde, depending on the type of welding and the materials being welded. Welding fumes also contain a mixture of metal particles, such as manganese, chromium, nickel, and cadmium, which can have various toxic effects. In addition, welding can produce nitrogen oxides and carbon monoxide, which are harmful air pollutants.

It is expected that these impacts can be expected primarily during the construction phase of the Project.

4. Release of smoke during burning of vegetation (accidental or planned) during land clearance activities and as a result of wildfires caused by possible malfunctioning of the high-voltage facilities

The burning of vegetation, whether accidental or planned, releases a complex mixture of smoke containing numerous pollutants with varying impacts on human health and the environment. Key pollutants in the vegetation smoke are the PM, CO, NOx, VOCs and PAHs.

The height and spread of the smoke plume depend on factors like the type and amount of vegetation burned, weather conditions, and terrain. Larger fires and stagnant air can lead to the accumulation of smoke and heightened health risks.

Smoke exposure can exacerbate existing respiratory and cardiovascular conditions, particularly in vulnerable populations like children, the elderly, and those with pre-existing health problems. Smoke can contribute to air pollution, reduce visibility, and deposit pollutants on land and water bodies. It can also affect local weather patterns and contribute to climate change.

5. Corona discharge

Corona discharge in overhead transmission lines (OHTL) is an electrical phenomenon that occurs when the electric field strength around the conductor exceeds the dielectric strength of the air. This causes the air surrounding the conductor to ionize, resulting in a partial discharge of energy in the form of light, sound, and heat.

This phenomenon is most common in high-voltage transmission lines, where the electric field strength is strongest. Corona discharge can cause several problems for transmission lines, including:

Power loss: Corona discharge can result in significant power losses, which can reduce the efficiency of the transmission line.

Radio interference: The ionization of the air can also cause radio interference, which can disrupt communication systems.

Audible noise: Corona discharge can also generate audible noise, which can be a nuisance for people living near transmission lines.

Ozone production: The ionization of the air can also produce ozone, which is a harmful pollutant.

Within the AZURE project framework, the phenomenon will potentially occur during the operation phase under respective weather conditions. Likelihood of the corona discharge is moderate.

Main characteristics of anticipated air quality impacts and their respective magnitudes resulting from the Project activities is provided in the tables below.

Table 9.8. Dust related impacts of the project

Transportation and movement	
Impact	Emissions of dust and particulate matter during movement of vehicles and transportation of the construction materials / equipment.
Receptor sensitivity	High – workers, farmers, residents of nearby houses along the access roads Moderate – ecosystems
Impact parameters	The impacts are direct The impacts are short-term with long-term likelihood The impacts are localized for spreading around small construction sites Likelihood of the impact is high Impact magnitude is high for workers, farmers and nearby houses, and moderate for ecosystems
Impact importance	Importance of the impact is high, as most receptors demonstrate high sensitivity
Land clearing, excavation, slope cutting	
Impact	Emissions of dust and particulate matter during land clearing, excavation and slope cutting works
Receptor sensitivity	High – workers, local farmers Moderate – ecosystems Low - residents of nearby houses
Impact parameters	The impacts are direct The impacts are short-term with short-term likelihood, actual for the limited time spent for erecting individual project facilities The impacts are localized for spreading around small areas Likelihood of the impacts is high Impact magnitude is high for workers and local farmers, moderate for ecosystems, and low for nearby residents
Impact importance	Importance of the impact is high, as most receptors demonstrate high sensitivity

Table 9.9. Impacts related to emission of pollutant and greenhouse gases

Pollutant gases due to fuel consumption	
Impacts	VOCs and NOx emissions as a result of fuel consumption
Sensitivity of receptor	Moderate – all receptor categories (to the expected emission levels)
Features of impact	The impacts are direct as they come from project activities The impacts are long-term The impacts are localized for spreading around small areas and access roads Likelihood of the impacts is high Impact magnitude is high during the construction, and low during the operation phases of the projects
Importance of impact	Importance of the impacts is moderate, as the impact will be imposed in a scheduled and limited way across the construction phase, and from time to time during the operation phase of the Project.
Fugitive emissions	
Impacts	Release of VOCs and other pollutants during concrete mixing, painting, and welding (fugitive emissions)
Sensitivity of receptor	High – all receptor categories
Features of impact	The impacts are direct as they come from project activities The impacts are midterm as they are expected to occur during the construction phase of the Project The impacts are localized for spreading around small construction areas Likelihood of the impacts is moderate Impact magnitude is high, unless the preventive measures are undertaken
Importance of impact	Importance of the impacts is high, as they will be imposed upon receptors with high sensitivity.
Greenhouse gases	
Impacts	CO2, CH4 and N2O emissions as a result of fuel consumption
Sensitivity of receptor	Moderate – all receptor categories (to the expected emission levels)
Features of impact	The impacts are direct as they come from project activities

	The impacts are long-term The impacts are localized for spreading around small areas and access roads Likelihood of the impacts is high Impact magnitude is high during the construction, and low during the operation phases of the projects
Importance of impact	Importance of the impacts is moderate, as the impact will be imposed in a scheduled and limited way across the construction phase, and from time to time during the operation phase of the Project.
Smoke	
Impacts	Release of PM, CO, NOx, VOCs and PAHs with the smoke due to burning of the vegetation cover
Sensitivity of receptor	High – all receptor categories (to the expected emission levels)
Features of impact	The impacts are direct as they come from project activities The impacts are short-term with long-term likelihood The impacts are local for spreading around and at a certain distance from the activity areas Likelihood of the impacts is low, as vegetation burning is not among preferred land clearing methods of the Project, whereas the likelihood of any accidents is low throughout the Project lifetime Impact magnitude is high
Importance of impact	Importance of the impacts is high, as, if the impact takes place, it will be a high magnitude impacts imposed upon highly sensitive receptors.
Corona discharge	
Impacts	Release of small amounts of ozone and nitrogen oxides under certain weather conditions
Sensitivity of receptor	Low – all receptor categories
Features of impact	The impacts are direct as they come from project activities The impacts are short-term with long-term likelihood The impacts are localized for spreading around and at a certain distance from the activity areas

	Likelihood of the impacts is moderate Impact magnitude is moderate
Importance of impact	Importance of the impacts is moderate.

9.2.6. Proposed impact mitigation measures

Volumes of dust, pollutants, and greenhouse gas emissions generated during the implementation of the project activities will not exceed the allowable concentration limits adopted at the international and national levels, as well as under the current ESIA. In the meantime, in order to prevent an increase in the magnitude and severity of the identified impacts, implementation of the impact management activities provided in the Table 9.10 is recommended.

9.2.7. Residual Impacts

The residual effects of the Project on atmospheric air quality are expected to be negligible and short-term, provided that the mentioned above impact mitigation plans are implemented correctly and on time.

Table 9.10. Measures to manage air related impacts

İmpact type	Magnitude		Mitigation measures		Post-action magnitude	
			Environment	Description		
Dust / particular matter	High construction phase)	Moderate (operation phase)	Planning	**1.** Preparation and implementation of Dust Management Plan		
			Construction sites	**1.** Regular watering of construction sites, excavation and land clearing areas, unpaved access roads, roads passing through the nearby settlements, and material stockpiles using the water trucks **2.** Designating specific areas for material storage and handling, Installing temporary barriers or fences to reduce the impact of wind on dust dispersion **3.** Breaking down construction activities into phases to reduce the overall area exposed to dust generation at any given time **4.** Where applicable, using chemical dust suppressants (e.g. magnesium chloride or calcium chloride) to bind dust particles and prevent them from becoming airborne	Low (construction phase)	Negligible (operation phase)
			Vehicles / equipment	**1.** Enforcing speed limits of 30 km/h on construction sites and access roads can help minimize dust generation from vehicle movement **2.** Restriction of Project related traffic in the areas outside designated roads **3.** Maintenance of the tire pressure in the vehicles **4.** Cleaning vehicle tires and undercarriages before exiting construction sites **5.** Using covered trucks for transporting loose materials (e.g. sand, gravel or soil) **6.** Keeping construction equipment well-maintained to minimize dust emissions		

İmpact type	Magnitude		Mitigation measures		Post-action magnitude	
			Environment	Description		
				7. Ensuring that exhaust systems on vehicles and equipment are in good working order to reduce particulate emissions **8.** Using equipment with advanced emission control technologies, such as diesel particulate filters		
			Training / monitoring	**1.** Training the drivers and equipment operators on dust minimization **2.** Monitoring dust levels around construction sites and access roads to assess the effectiveness of mitigation measures and identify areas needing improvement, reporting of the monitoring results to AzerEnerji and, via AzerEnerji, to the respective authorities		
Emission of pollutant and greenhouse gases due to fuel consumption	High (construction phase)	Moderate (operation phase)	Planning	**1.** Preparation and implementation of Emissions Management Plan **2.** Planning construction activities to minimize idle time and unnecessary movement of trucks **3.** Planning efficient transportation routes to minimize distances and fuel consumption **4.** Providing shuttle services for workers to reduce individual vehicle commutes	Moderate (construction phase)	Negligible (operation phase)
			Vehicles / equipment	**1.** Using newer, fuel-efficient equipment with advanced emission control technologies, such as diesel particulate filters (DPFs) and selective catalytic reduction (SCR) systems **2.** Using larger trucks with higher carrying capacity to reduce the overall number of vehicles on the road **3.** Considering hybrid or electric-powered alternatives for smaller vehicles and equipment **4.** Deployment of telematics systems to monitor equipment performance, fuel consumption, and idle time, identifying opportunities for optimization and reducing emissions		

İmpact type	Magnitude	Mitigation measures		Post-action magnitude	
		Environment	Description		
			5. Keeping engines idle when vehicles and equipment are not in use **6.** Regular maintenance of construction equipment and vehicles to optimize fuel efficiency and minimize emissions **7.** Timely replacement of obsolete machines and equipment with new ones **8.** Regular check and adjusting of the tire pressure when required		
		Training / monitoring	**1.** Training the equipment operators and drivers in eco-driving techniques to reduce fuel consumption and emissions **2.** Regular check of compliance of emission indicators with the standards in motor transport and equipment		
Fugitive emissions	Moderate	Equipment	**1.** Rigorous inspection for all construction equipment to identify and repair leaks promptly **2.** Adhering to manufacturer-recommended maintenance schedules to ensure proper functioning of seals, gaskets, and other components that prevent leaks **3.** Implementation of Leak Detection and Repair Program using appropriate technologies like infrared cameras or gas detectors to identify and quantify leaks, followed by timely repairs **4.** Ensuring that proper shutdown procedures are followed to minimize leaks during equipment downtime	Low (construction phase)	
		Storage tanks	**1.** Storing materials in designated areas with appropriate containment measures to prevent spills and leaks		

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
				2. Conducting frequent inspections of storage tanks for leaks or signs of damage. **3.** Utilizing secondary containment systems, such as berms or liners, to prevent spills from reaching the environment. **4.** Installation of vapor recovery systems on storage tanks to capture and control emissions during filling and emptying operations. **5.** Ensuring that all valves, flanges, and seals on storage tanks are in good working condition and replaced when necessary.	
			Training / monitoring	**1.** Training the workers on the importance of fugitive emissions control, proper equipment operation, leak identification, and reporting procedures. **2.** Conducting awareness campaigns to inform workers and nearby communities about the potential impacts of fugitive emissions and the mitigation measures in place	
Smoke	Moderate (planned)	High (unplanned)	Planned burning	**1.** Exploring alternative land clearing methods that do not involve burning, such as mechanical clearing or composting **2.** Burning during periods of favourable weather conditions, such as low wind speeds, high humidity, and stable atmospheric conditions **3.** Avoiding burning during periods of drought or high fire risk **4.** Checking air quality forecasts and avoiding burning when air quality is already poor **5.** Obtaining necessary permits from relevant authorities before conducting any burning activity	Low

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
				6. Informing local fire departments and nearby communities about planned burning activities **7.** Establishing firebreaks around the area to be burned **8.** Starting small, controlled fires along the upwind edge of the area to be burned **9.** Setting controlled fires against the wind to create a burned area that the main fire cannot easily cross **10.** Monitoring the burn area closely and ensure the fire is completely extinguished after the burn **11.** Implementing rehabilitation measures to restore soil health and promote vegetation regrowth after the burn	
			Accidental burning	**1.** Identification of the areas prone to fire outbreaks based on factors like vegetation type, weather patterns, and human activities **2.** Conducting regular vegetation management activities, such as controlled burns and brush clearing, to reduce the amount of flammable material available **3.** Monitoring the weather conditions, especially during dry and windy periods, and issuing fire warnings or restrictions as needed **4.** Installation of early warning systems (e,g, fire lookout towers and remote sensing technologies), to detect fires quickly and enable rapid response **5.** Implementation and enforcement of fire restrictions during periods of high fire risk **6.** The use of fire-resistant construction materials	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
			7. Ensuring that swift response is given to reported fires **8.** Conducting post-fire assessments to evaluate the damage and implement rehabilitation measures to restore the affected ecosystems	
Corona discharge	Moderate (operation phase)	Equipment	**1.** Increasing the conductor diameter: This reduces the electric field strength around the conductor, making it less likely for the air to ionize. **2.** Using bundled conductors: Bundled conductors consist of multiple smaller conductors, which also helps to reduce the electric field strength. **3.** Using corona rings: Corona rings are metal rings that are placed around the conductor, which helps to distribute the electric field more evenly and reduce the likelihood of ionization.	Negligible

9.3. Noise, Vibration, Light Pollution

9.3.1. Scope of assessment

OHL construction projects can generate significant noise and vibration impacts, particularly during certain phases of construction and in close proximity to residential areas or sensitive environments. These impacts can negatively affect local communities and wildlife, leading to complaints, health issues, and ecological disturbances. In this chapter, the assessment results of the potential Project generated noise and vibration impacts will be analyzed, and suggestions will be delivered on how to prevent or minimize the identified adverse effects.

Geographical scope of the air impact assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations. The assessment period covers both the construction and operation phases of the project. The following tasks were performed as part of the assessment:

1) Identification of potential impact sources to be generated in connection with the Project activities
2) Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
3) Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “5.9 Noise and Vibration” sections of the EBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.3.2. Sources and Sensitive receptors

Within the assessment framework, the following main source categories of the project-borne noise and vibration related impacts were identified:

A. Noise:

- **Construction Activities**: The operation of heavy machinery, such as excavators, cranes, pile drivers, and generators, can produce high levels of noise that can be disruptive and annoying to nearby residents.
- **Transportation**: The transportation of construction materials and equipment, often involving large trucks and other vehicles, can generate traffic noise, especially on access roads.

B. Vibration:

- **Pile Driving**: The installation of foundations for OHL towers often involves pile driving, which can generate significant ground vibrations. These vibrations can cause annoyance, damage to nearby structures, and disturbance to sensitive equipment.

- **Heavy Machinery**: The operation of heavy machinery can also transmit vibrations through the ground, potentially affecting nearby buildings and infrastructure.

C. Light pollution:

- Pollution of ambient air with light due to temporary and security lighting and vehicle lights during the construction phase, and aviation warning lights (only adjacent to airports), substation lighting, access road lighting and maintenance lighting during the operation phase.

Sensitive receptors of the above impact types were identified as follows:

- Local staff of AzerEnerji and its' subcontractors engaged in the construction and maintenance of the Project facilities
- Residents of the nearby houses, farmers and other people working around along the Project facilities
- Fauna species
- Structures and buildings located in direct vicinities of the vibration sources, including objects of historical heritage and nearby houses.

Sensitivity level of the receptors was assessed as high for all receptor categories.

9.3.3. Project standards and evaluation criteria

A. Noise

Noise is normally attenuated by surface by about 1.5 dBA every time when distance doubles on acoustically absorbing or "soft" surfaces (i.e. the places with absorbed surfaces, for ex: soft soil, grass and scattered shrubs and trees). If spread geometrically, doubling the distance between the source and receiver results in 4.5 dBA sound attenuation in linear sources and 7.5 dBA attenuation in point sources due to excessive surface absorption.

EU legislation does not provide for any restrictive levels related to noise and vibration sources, and the resolution of these issues have been assigned to the competence of separate member states. Taking all this into account, the requirements of the national legislation of the Republic of Azerbaijan and the recommendations of the World Health Organization have been relied upon during the development of the

Project standards87. According to the recommendations of the World Health Organization88 applicable to the lines of industry, the noise limits are 70 dB for long-term operating sound sources (24 hours) and 110 dB for consumable strong noise sources.

The noise levels that are acceptable in the Republic of Azerbaijan are given in the table below, along with the standards that comply with the WB ESSs.

Table 9.11. Noise level standards

Source	Receptor	Standard (dBA/hour)			
		Az	Day	Night	Project standard
Noise	Production areas	80	80	80	80
	Exposed side of the fenced area	55	55	55	55
	Work places for truck drivers and service	70	70	70	70
	Residential area (Administrative area)	40	40	30	40/30
	Quiet rural area	30	30	30	30
	Wild nature	20	20	20	20

Estimated noise levels for a number of mechanisms and machinery and their spread are given in the table below.

Table 9.12. Noise levels generated by engine- equipped machinery

Equipment	5 m	10 m	20 m	40 m	50 m	100 m	150 m	200 m
Buldozer	86	80	74	68	66	60	56	54
Excavator	84	78	72	66	64	58	54	52
Trucks	90	80	78	72	70	64	60	58

87 Noise level Guadlines of WBG EHSG refer to the Guidelines for Community Noise, World Health Organization (WHO), 1999

88 Guidelines for Community Noise - World Health Organization

Electric saw	81	75	69	63	61	55	51	49

B. Vibration

The Acceptable Standards on vibration taken as a basis during the impact assessment have been estimated in accordance with USEPA's Construction Damage Assessment Criteria and applicable "Vibration and Noise Pollution Standards Generating an Adverse Impact on the Environment and Human Health" in the Republic of Azerbaijan. The following vibration level standards are considered as project standards in accordance with the WB ESS.

Table 9.13. Project standards on vibration levels

Soil vibration levels for receptors in the vicinity of ore extraction areas	Vibration frequency (Hz)	Maximum level (mm/s)
	3-100	50
Soil vibration levels for receptors in the vicinity of construction sites	Continuous vibration (mm/s)	Vibration at intervals (mm/s)
	15	30

9.3.4. Assumptions and Limitations

The ambient air impact assessment was implemented based on the following assumptions and limitations:

Assumptions

- The project design, including the proposed OHL route, tower locations, construction methods, will remain as described in the project documentation. Any changes in design could alter the predicted impacts
- Construction equipment will be operated in accordance with manufacturer specifications and best practices to minimize noise and vibration.

Limitations:

- The assessment is limited by the availability of accurate and representative data on baseline noise and vibration levels, as well as data on the specific characteristics of the construction equipment and methods to be used.
- The assessment may not fully consider the cumulative impacts of the OHL project in combination with other existing or planned noise and vibration sources in the area

- Noise and vibration models are based on theoretical calculations and may not perfectly reflect real-world conditions. There is inherent uncertainty in predicting the exact levels of noise and vibration that will be experienced at specific locations.
- The assessment focuses on short-term impacts during the construction phase. Long-term impacts, such as those related to the operation of the OHL or potential changes in land use patterns, may not be fully considered.
- The perception of noise and vibration can vary among individuals, and the assessment may not fully capture the subjective experience of those affected
- Unforeseen events, such as equipment malfunctions and accidents, can lead to unanticipated impacts.

9.3.5. Identified impacts

1. Noise generated during the construction phase

The operation of heavy machinery during the Project will generate a wide range of noise impacts with different intensity, frequency, and duration. These impacts can significantly affect the surrounding environment, workers, and nearby communities.

There are the following types of noise Impacts expected during the construction phase of the Project:

- Continuous Noise: Heavy machinery like bulldozers, excavators, and cranes produces continuous noise during operation due to their engines, moving parts, and hydraulic systems. This constant noise can be particularly irritating and disruptive, especially in residential areas or near noise-sensitive facilities.
- Impulsive Noise: Certain activities like pile driving and rock breaking generate impulsive noise, characterized by short bursts of high-intensity sound. These sudden and loud noises can be startling and potentially harmful to hearing if workers are not adequately protected.
- Low-Frequency Noise: Some heavy machinery, especially large diesel engines, produce low-frequency noise, which can travel long distances and penetrate buildings. This type of noise can be particularly annoying and may cause vibrations in structures, leading to discomfort and even sleep disturbances for nearby residents.

Magnitude of the noise impacts is affected by the following factors:

- Type and size of equipment: Larger and more powerful machinery generally produces higher noise levels
- Operating Conditions: The type of operation, such as idling, moving, or excavating, can influence the noise level

- Distance from Source: Noise levels decrease with distance from the source of noise generation
- Terrain and Weather: The surrounding terrain and weather conditions can affect how noise propagates
- Duration of Exposure: Prolonged exposure to high noise levels can increase the risk of hearing damage and other health problems.

Examples of Noise Levels from Heavy Machinery (at a reference distance of 15 meters) are provided below:

- Bulldozer: 85-95 dB(A)
- Excavator: 80-90 dB(A)
- Crane: 75-85 dB(A)
- Pile Driver: 100-110 dB(A)

Impacts of the noise on people, including workers of AzerEnerji and its' subcontractors, farmers and residents and nearby settlements, include a) hearing damage due to prolonged exposure to high noise levels; b) sleep disturbance if the impact is imposed during nighttime; and c) stress and annoyance after being exposed to the excessive noise.

Impacts on Wildlife include a) behavioral changes as the excessive noise can disrupt animal communication, foraging, and breeding patterns, b) physiological stress leading to health problems and decreased reproductive success, c) habitat displacement as some animals may abandon their habitats due to excessive noise.

The noise generating activities associated with the Project will be the vehicles and equipment, which can generate the noise levels up to 110 dBA (Table 9.14). Noise generally attenuates (decreases) at a rate of 6 to 7.5 dBA per doubling of distance. Therefore, during operating of the noisiest equipment, the impact level to most sensitive receivers, except for actual workers, will not be more than 80 dBA.

Table 9.14. Typical Noise levels expected from the Project activities

Activity	Noise levels (dBA)
Ground Clearing	84
Excavation	89
Foundation	78
Erection	85
Vibrator ANV-III	89
Pile Driving	90-105

Source: U.S. Environmental Protection Agency, Noise from Construction Equipment and operations, 1971

As shown above, the Project associated noise sources will be mobile vehicles and equipment characterized by high noise generation (which is approximately 80 - 110 dBA) from a distance of 5 meters. We have, through applying the attenuation of point source method and without taking into account of such attenuation by sound barriers or atmospheric absorptions, calculated out the geometric divergence of sound attenuation, and the formula is as follows:

* Lr = Lr0 – 20lg (r / r0)

Where;

Lr	: A weighted sound pressure level at place r away from noise source in dB(A)
Lr0	: A weighted sound pressure level at place r0 away from noise source in dB(A)
R	: The distance between the point of estimation and noise sources in meters
r0	: The distance between the monitoring point and noise source in meters
20lg	: 20 log

* Engineering Acoustics, Michael Moser.

Table 9.15 below summarizes estimated results of noise calculated for some equipment and machinery:

Table 9.15. Noise levels generated by engine-equipped machinery

Equipment	5 m	10 m	20 m	40 m	50 m	100 m	150 m	200 m
Crane	85	79	73	67	65	59	55	53
Bulldozer	86	80	74	68	66	60	56	54
Excavator	84	78	72	66	64	58	54	52
Trucks	90	80	78	72	70	64	60	58
Electric saw	81	75	69	63	61	55	51	49

Noise generated by AHV-III during the work process is similar to the noise generated by a heavy truck. Noise generated by truck, vibrator and bulldozer operations and by associated vehicular traffic is likely to affect sensitive receptors located within 50 m of the source. However, this impact will be temporary, and the impact will disappear upon completion of the construction phase.

The prediction of the noise levels due to combined activities is given in the following table for each significant stage of Works using the individual plant noise levels, and the resulting impacts at varying distances from the activities are shown.

Table 9.16. Typical Combined Noise Levels

Activity	Combined Noise Levels, dBA															
	5 m	10 m	15 m	20 m	40 m	50 m	100 m	150 m	200 m	250 m	300 m	350 m	400 m	450 m	500 m	1000 m	2000 m
Site clearance	90	89	88	84	78	74	67	64	61	59	57	56	55	54	53	43	39
Topsoil Stripping with bulldozer	89	88	87	83	77	72	66	63	60	58	56	55	54	53	52	42	38
Road Works	85	84	83	79	73	69	62	59	56	54	52	51	50	49	48	38	34

Source: USEPA, 1971, and Barnes et al., 1979

When data in the above table are reviewed, sound power levels within the 50 m from the noise resources (powered mechanical equipment) will expose the human beings. The sensitive receptors beyond 50 m from the noise resources will be affected gradually moderate and low. Effect of impact to wild animals will be short-term therefore it isn't considered.

In determining the overall noise level at the receptor(s), consideration should also be given to a number of factors that increase and/or decrease the noise level by affecting the propagation of sound. In principle, these can be summarized below;

- Increase due to multiple reflections from vertical surfaces – hard sites (e.g. from high buildings on both sides of a road, bare rock surfaces),
- Decrease due to air absorption,
- Decrease due to absorptive ground cover – soft sites (such as grass or cultivated land),
- Decrease due to trees and woods – soft sites, and
- Decrease due to barriers of all types (e.g. due to topography).

If the construction works will proceed in a preliminarily scheduled way, the noise impacts of the Project are expected to be temporary and of a moderate magnitude with high mitigation potential.

2. Vibration generated during the construction phase

OHL construction activities, particularly those involving heavy machinery and groundworks, can generate significant vibration impacts. These vibrations can propagate through the ground and affect nearby structures, infrastructure, and people.

Vibration sources of the Project were identified as follow:

- **Pile Driving**: The installation of foundations for OHL towers often involves driving large piles into the ground, which creates intense, short-duration vibrations. These vibrations can travel considerable distances and may cause noticeable shaking or rattling in nearby buildings.
- **Heavy Machinery**: The operation of heavy machinery like excavators, bulldozers, and cranes can also generate vibrations, although typically of lower intensity and longer duration than pile driving.

Vibration levels and air currents that cause concern to residents are usually below the damage limits of the respective building. The U.S. Environmental Protection Agency has established building damage assessment criteria as shown in the Table 9.17 below:

Table 9.17. Criteria for assessing damage to a building

Type of building	Vibration level	Air current level (dB re 20 uPa)
Sensitive and cultural-historical heritage	PVS* 5 mm/s	133 dB (linear) highest
Living	PVS 10 mm/s	133 dB (linear) highest
Commercial / Industrial	PVS 25 mm/s	133 dB (linear) highest

* PVS: Highest (peak) vector sum

Within the project, works will be performed in open areas relatively far from populated areas. During operation, vibratory and geotechnical drilling rigs will not affect settlements, but will impose impact upon the workers of AzerEnerji and its subcontractors, as well as farmers and other people nearby. At the same time, the effect of the vibration impacts will be potentially high for the animal specimens and structures, detected in the surroundings of the construction areas.

3. Light pollution

Light pollution from OHL projects casts a wide net of negative impacts, affecting wildlife, human health, astronomy, economics, and safety. For wildlife, artificial light disrupts natural behavior, hindering navigation in migratory birds, altering predator-prey dynamics, and disrupting mating and nesting behaviors. It also

interferes with plant growth cycles and affects pollinators like moths and bats, ultimately impacting the delicate balance of ecosystems and food webs.

Humans also bear the brunt of light pollution's effects. Exposure to artificial light at night suppresses melatonin production, leading to sleep disturbances, fatigue, and other health problems. The disruption of the body's natural sleep-wake cycle, known as the circadian rhythm, increases the risk of various health issues like obesity, diabetes, and cardiovascular disease. Chronic exposure to light pollution has even been linked to increased stress levels and anxiety.

Light pollution significantly diminishes our view of the cosmos. Sky glow from OHL lighting drastically reduces the visibility of stars and other celestial objects, hindering astronomical research and stargazing activities. Additionally, stray light from OHL facilities can interfere with sensitive astronomical observatories and telescopes.

Economically, light pollution leads to energy waste due to unnecessary or inefficient lighting, contributing to greenhouse gas emissions and higher energy costs. It can also decrease property values in affected areas due to its negative aesthetic impact.

Moreover, light pollution poses safety concerns. Bright, unshielded lights from OHL facilities can create glare for drivers, reducing visibility and increasing the risk of accidents, especially during nighttime hours.

Understanding these diverse impacts is crucial for implementing effective mitigation measures. By carefully considering lighting design, utilizing appropriate technology, and adopting responsible lighting practices, OHL projects can minimize light pollution and its associated negative effects.

Main characteristics of anticipated noise and vibration related impacts resulting from the Project activities is provided in the Table 9.18 below.

Table 9.18. Noise and vibration related impacts of the Project

Noise	
Impact	Noise generated during the construction phase by heavy machinery
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are midterm expected during the construction phase The impacts are localized for spreading around construction sites Likelihood of the impact is high

	Impact magnitude is high for workers, farmers and animal species, and low for nearby houses
Impact importance	Importance of the impact is high.
Vibration	
Impact	Vibration generated during the construction phase by heavy machinery
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are midterm expected during the construction phase The impacts are local for spreading around construction sites Likelihood of the impact is high Impact magnitude is high for workers, farmers and animal species, and negligible for nearby houses and historical monuments
Impact importance	Importance of the impact is high
Light pollution	
Impacts	Light pollution of the air due to the Project activities and facilities
Sensitivity of receptor	High – all receptor categories
Features of impact	The impacts are direct as they come from project activities The impacts are long-term The impacts are regional Likelihood of the impacts is high Impact magnitude is high
Importance of impact	Importance of the impact is high

9.3.6. Proposed impact mitigation measures

Noise and vibration related impacts to be generated as a result of the Project activities are expected not to exceed neither international, nor national and project standards. In the meantime, in order to prevent an increase in the volume and magnitude of the identified impacts, implementation of the impact management activities provided in the Table 9.19 is recommended.

9.3.7. Residual impacts

The residual noise and vibration impacts on the Project are expected to be minor and short-lived, provided that the above impact mitigation plans are implemented in a proper and timely manner.

Table 9.19. Measures to manage noise and vibration related impacts

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Noise	High (construction phase)	Planning	**1.** Preparation and implementation of Noise Management Plan	
		Source control	**1.** Selection and use of the construction equipment with lower noise emissions **2.** Using electric or hybrid machinery where possible **3.** Regular maintenance of equipment to keep it running smoothly and reduce unnecessary noise **4.** Employing quieter operating techniques such as reducing engine speeds, avoiding excessive idling, and turning off equipment when not in use	Low
		Path and personnel control	**1.** Erection of temporary noise barriers or walls made of sound-absorbing materials to block or reduce noise propagation **2.** Optimization of the layout of the construction sites to locate noisy activities away from sensitive areas **3.** Requesting the nearby third-party people to keep away from the close proximity to the noisy activities **4.** Providing workers with ear protection such as earplugs or earmuffs	
		Scheduling	**1.** Tailoring noise mitigation measures to the specific local context, considering the proximity of residential areas, cultural sensitivities, and environmental factors	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
			2. Scheduling noisy activities during less sensitive times of the day, avoiding early mornings, evenings, nights and weekends **3.** Informing the locals about the construction schedule and planned noise mitigation measures **4.** Establishment of a complaints procedure to address noise concerns from residents promptly	
		Monitoring	**1.** Regular monitoring of the noise levels at the construction sites and surrounding areas to ensure compliance with regulations and assess the effectiveness of mitigation measures **2.** Review and adjustment of the noise mitigation measures based on monitoring results and feedback from locals	
Vibration	High	Pre-construction Planning	**1.** Choosing construction sites that minimize the proximity to vibration-sensitive receptors like residential buildings, historical structures, and sensitive equipment **2.** Conducting of a thorough geotechnical investigation to assess the soil properties and understand how vibrations will propagate through the ground **3.** Using specialized software and modelling techniques to predict vibration levels at sensitive receptors during various construction activities	Low
		Construction methods and equipment	**1.** If pile driving is necessary, considering using alternative methods like drilled shafts or micropiles, which generally produce lower vibration levels **2.** Selection of a machinery with built-in vibration isolation features or add-on damping systems	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
			3. Maintenance of the equipment to minimize unnecessary vibrations **4.** Using smooth and controlled movements of machinery to reduce vibrations	
		Isolation and damping	**1.** Placing vibration isolation pads or mats under heavy machinery and equipment to reduce the transmission of vibrations to the ground **2.** Installation of damping materials on structures or equipment to absorb vibrations and reduce their impact	
		Monitoring / control	**1.** Implementation of a comprehensive vibration monitoring program to measure vibration levels at sensitive receptors during construction **2.** Establishment of pre-defined trigger vibration levels based on regulatory limits and sensitivity **3.** Maintaining open communication with stakeholders	
Light pollution	High	Design and technology	**1.** Using fully shielded light fixtures that direct light downward, preventing it from escaping upward and creating sky glow. **2.** Utilizing the lowest intensity lighting necessary to meet safety requirements. This can be achieved through the use of lower wattage bulbs, dimming controls, or motion sensors. **3.** Choosing LED lights with warm colour temperatures (around 2200K), as they emit less blue light, which is more disruptive to wildlife and sleep cycles.	Low

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
			4. Employing adaptive lighting systems that automatically adjust light intensity based on ambient light levels and activity, reducing unnecessary illumination.	
		Operation sites	**1.** Implementing curfews or timers to turn off or dim lights during periods of low activity or when not needed for safety. **2.** Utilizing motion sensors to activate lights only when needed, such as when vehicles or personnel are present. **3.** Ensuring that lighting fixtures are regularly cleaned and maintained to prevent dirt buildup and ensure optimal light direction. **4.** Plant trees or shrubs around OHL facilities to help shield and absorb light, reducing its spread into the surrounding environment **5.** Use of smart lighting systems that can be remotely controlled and adjusted to optimize energy use and minimize light pollution	

9.4. Soil Quality

9.4.1. Scope of Assessment

It is supposed the project will not have any impact on the geological environment of the area. At the same time, the Projects can have various soil-related impacts, both during construction and throughout the operational lifespan of the transmission lines and SS facilities. These impacts can affect soil quality, stability, and erosion, and may have broader consequences for the surrounding environment and ecosystems.

This chapter will analyse the results of the Project's potential impacts on the quality of the fertile soil cover from various sources, as well as the potential impacts sourcing from the mud volcanos in the Gobustan area.

Geographical scope of the soil impact assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations. The assessment period covers both the construction and operation phases of the project. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “5.5 Soils and Landuse” sections of the EBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.4.2. Sources and Sensitive Receptors

Potential soil contamination within the Project framework can originate from various sources, posing risks to the environment, ecosystems, and human health. The primary sources include:

1. Construction Activities:
   - **Soil excavation**: excavation of fertile and underlying soil cover to erect basements of the OHL towers and other facilities constitutes the most critical soil quality impact of the Project, as it will result in a complete loss of the fertile soil cover on the designated construction sites
   - **Soil disturbance**: laying and use of the unpaved access roads, as well as movement of vehicles inside and around the construction sites are another impact which may worsen the soil’s structure and quality parameters
   - **Spills and Leaks**: Accidental spills or leaks of fuels, lubricants, hydraulic fluids, and other chemicals used in construction equipment and vehicles can contaminate soil and groundwater.
   - **Waste Disposal**: Improper disposal of construction waste, such as contaminated soil, concrete debris, and packaging materials, can introduce pollutants into the soil.

- **Storage of Hazardous Materials**: Poorly managed storage of hazardous materials, such as paints, solvents, and cleaning agents, can result in leaks or spills that contaminate the surrounding soil.

2. Operational Activities:
   - **Herbicide Use**: The use of herbicides to control vegetation growth under the OHL routes can potentially introduce persistent chemicals into the soil. These chemicals can accumulate over time and affect soil organisms, nutrient cycles, and potentially groundwater quality.
   - **Transformer Oil Leaks**: Older transformers may contain oils with polychlorinated biphenyls (PCBs), which are persistent organic pollutants. Leaks from these transformers can contaminate soil and pose long-term environmental risks.
   - **Corrosion of Metal Components**: Corrosion of metal components like tower foundations or grounding systems can release heavy metals into the soil.

3. External Sources:
   - **Atmospheric Deposition**: Airborne pollutants from industrial activities, vehicle emissions, and agricultural practices can settle on the soil, contributing to contamination.
   - **Runoff and Erosion**: Surface runoff from adjacent lands, especially those used for agriculture or industrial purposes, can carry pollutants like pesticides, fertilizers, or heavy metals onto the OHL routes. Erosion of contaminated soil from nearby areas can also contribute to soil contamination under the OHL
   - **Mud volcanic activity**: throughout the project lifecycle, mud volcanism can considerably influence soil cover integrity and quality parameters, as well as sustainability of the nearby Project facilities.

Sensitive receptors of the above impact types were identified as follows:

- **Workers** - construction workers and maintenance personnel involved in the Project are at a higher risk of exposure to soil contaminants due to their direct contact with the soil.
- **Land users** – the main impact receptors, whose livelihoods and welfare is mostly dependent on the soil resources and their fertility.
- **Ecosystems** – another key receptor category, represented by soil microorganisms, plants and animals – all highly dependent on the fertility and quality of the soil cover.
- **Surface and underground water resources** - Soil contamination can leach into surface water bodies like rivers, lakes, and streams, as well as infiltrate into groundwater aquifers. This can affect aquatic life, drinking water sources, and irrigation water quality.

9.4.3. Project standards and evaluation criteria

Azerbaijani standards sited in Paragraph 3.13.3 will be used as the soil quality standards accepted within the current Project framework and WB ESSs.

9.4.4. Assumptions and limitations

The soil quality assessment was implemented based on the following assumptions and limitations:

A. Assumptions

- the project design, including the proposed OHL route, tower locations, and construction methods, is accurate and will be followed during implementation. Any deviations could alter the predicted impacts on soil quality.
- Best management practices for erosion control, spill prevention, and waste management will be implemented effectively throughout the project lifecycle
- Materials used in construction, such as herbicides, concrete, and steel, will be of appropriate quality and will not pose additional contamination risks
- Soil quality models are based on simplified representations of complex processes and have limitations in predicting the exact nature and extent of impact
- The assessment is constrained by the availability of data on soil properties, pollutant concentrations, and other relevant parameters
- There is inherent uncertainty in predicting long-term impacts, as soil processes and pollutant behavior can be influenced by numerous interacting factors.

B. Limitations:

- Limited availability of detailed soil data, especially in remote areas, can hinder the accuracy of the assessment.
- Predicting long-term impacts on soil quality is challenging due to the complex interactions between pollutants, soil processes, and environmental factors.
- The assessment may not fully account for the cumulative impacts of the Project in combination with other existing or planned land uses that could affect soil quality.
- Accidental spills, equipment failures, or extreme weather events can occur unexpectedly, causing soil contamination or degradation that may not be captured in the assessment.
- The assessment may not fully consider the socioeconomic impacts of soil quality changes, such as effects on agricultural productivity or property values.

9.4.5. Identified impacts

1. Soil removal

Soil removal can have far-reaching and significant impacts on the environment and ecosystems. Potential adverse impacts of this activity include but not limited to soil erosion, loss of fertility, disruption of soil structure, destruction of habitats, water pollution, emergence of exogenous hazards, air pollution, economic losses, etc. It's crucial to consider the potential impacts of soil removal before undertaking any activities that involve it. Implementing appropriate mitigation measures can help minimize the negative consequences and ensure the sustainable use of land resources.

Although the impact will be of a low magnitude within the construction phase of the Project, removal of topsoil in general will make undertaking respective remediation and compensation measures of a high priority.

2. Soil disturbance

Disturbance of the unremoved soil as part of construction works will most likely occur all across the construction areas of the Project. Potential areas of the disturbed soils will be larger than that of the removed fertile soil layer. The impacts of soil disturbance can be wide-ranging and significant, affecting both the environment and human activities through soil compaction and erosion, loss of the soil's structure and fertility level, disruption of soil biology, decreased agricultural productivity, release of dust and pollutants and aesthetic impacts.

Although the impact magnitude and the receptor sensitivity levels are the same as in case of soil removal, minimizing the area of the soils disturbed as part of the Project, as well as undertaking soil rehabilitation measures pending completion of the construction works are among the high-priority impact mitigation measures of the AZURE project.

3. Soil contamination

Contamination of fertile soils as a result of accidental leaks, spills and disposals of non-hazardous and hazardous wastes can be characterized as the highest-magnitude potential soil related impacts of the Project, as the polluted soil cover can shortly migrate over distances driven by natural factors, such as wind, precipitation and surface flows. Moreover, the seriousness of the soil's contamination is higher as, if this happens, it is more effort and cost consuming to remediate the contaminated soil than to recover it from the disturbance.

During the operation phase, the spread, magnitude and likelihood of the soil contamination will be relatively less than during the construction. Thus, if all safety and quality assurance measures are undertaken, it is less expected that the soil will get polluted as a result of herbicide use, transformer oil leaks or the metal's corrosion. An only relatively more probable impact source of the operation phase will be the accidental releases from the maintenance vehicles and equipment. However, the likelihood of even this particular impact will be quite low and extended over the entire Project lifespan.

4. External impacts

Contamination and erosion of the Project area soils as a result of air depositions, runoff, erosion and mud volcanism are completely out of the range of the scope of the Project. However, as all these impacts can seriously affect the Project's sustainability, they must be duly considered during design and construction phases of the Project. Special attention should be paid in these regards to the volcanic hazards along "Navahi SS – Absheron-Garadagh WPP" OHL route. As seen from the Figure 9.1 below, there is at least one volcano with its' breccia field crossing the OHL right-of-way. Likelihood of the impact is assessed as

low for the construction and moderate for the operation phase of the Project. Magnitude and importance of the impact is assessed as high.

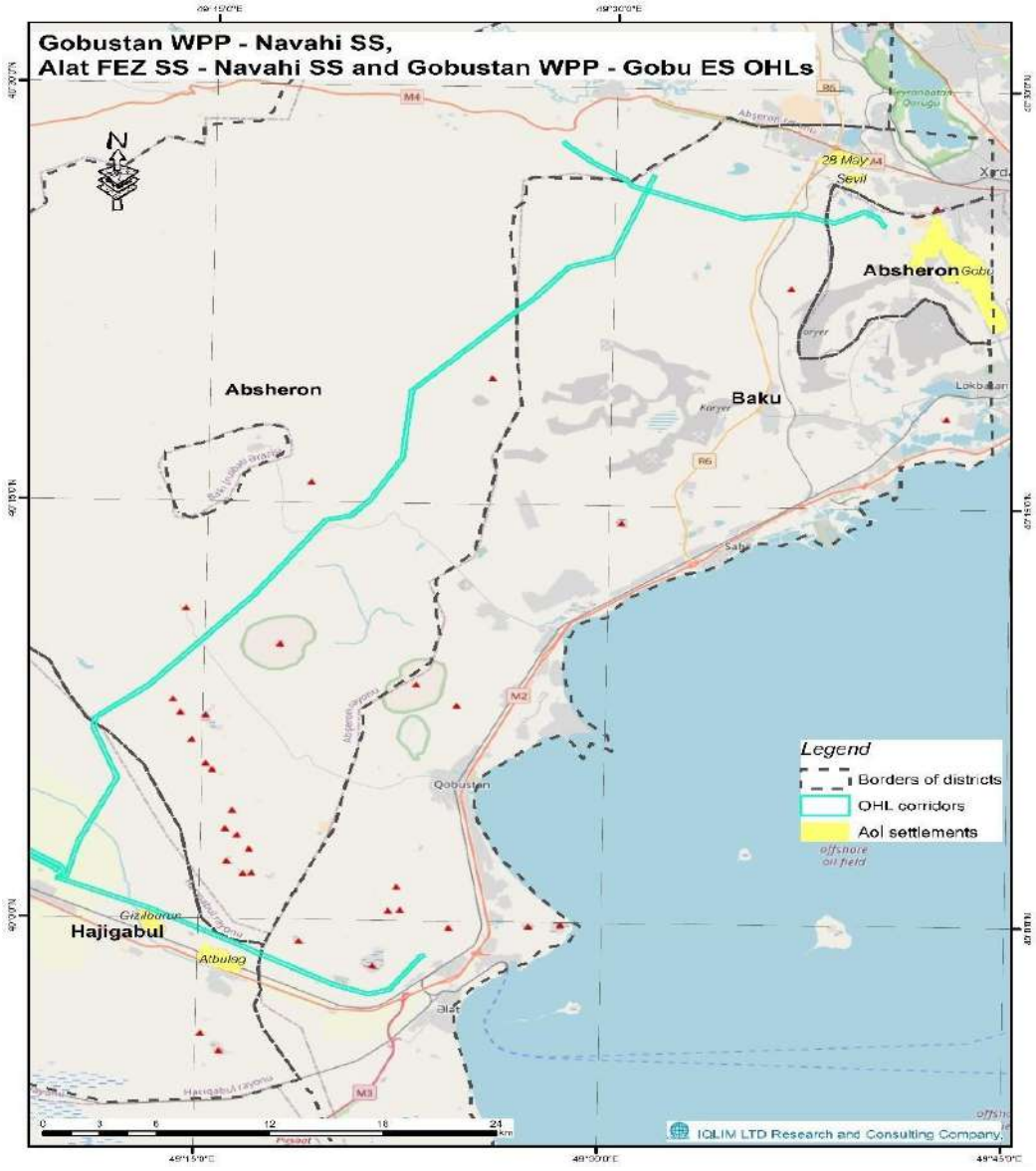


Figure 9.1: "Navahi SS – Absheron-Garadagh WPP" OHL corridor: location map of the closest volcanic structures

Summary of the described soil related impacts of the Project is provided in the Table 9.20 below.

Table 9.20. Soil quality related impacts of the Project

Soil excavation	
Impact	Removal of fertile and underlying soil cover as a result of basement excavation works
Receptor sensitivity	Moderate – ecosystems, land users
Impact parameters	The impact is direct The impact is long-term as it is permanent The impact is localized for spreading around part of the construction sites Likelihood of the impact is high Impact magnitude is low with technical specifications of the construction works considered
Impact importance	Importance of the impact is moderate as large volumes of soils will be excavated at the scale of the Project area
Soil disturbance	
Impact	Compaction, erosion, loss of structure, fertility and agricultural productivity, during the construction works
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are midterm expected during the construction phase The impacts are localized for spreading around the construction sites Likelihood of the impact is high Impact magnitude is high for workers, local communities, farmers, plants, animal species and water resources
Impact importance	Importance of the impact is high
Soil contamination during construction phase	
Impact	Contamination as a result of accidental leaks, spills and disposals of non-hazardous and hazardous wastes
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are midterm expected during the construction phase The impacts are local but can become regional due to the potential of spreading beyond Project area Likelihood of the impact is moderate Impact magnitude is high for all receptor categories
Impact importance	Importance of the impact is high
Soil contamination during operation phase	
Impact	Contamination as a result of leakages from the maintenance vehicles, herbicide use, transformer oil leaks or the metal's corrosion
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct

	The impacts are long-term with the potential to occur during the operation phase The impacts are local but can become regional due to the potential of spreading beyond Project area Likelihood of the impact is low Impact magnitude is high for all receptor categories
Impact importance	Importance of the impact is high
Impacts from external sources	
Impact	Contamination and erosion as a result of air depositions, runoff, erosion and mud volcanism
Receptor sensitivity	High – all receptor categories, plus Project facilities
Impact parameters	The impacts are direct The impacts are long-term with the potential to occur during the operation phase The impacts are localized for being limited to the limited spread of specific hazardous areas Likelihood of the impact is moderate Impact magnitude is high for all receptor categories
Impact importance	Importance of the impact is high

9.4.6. Proposed impact mitigation measures

In order to prevent an increase in the volume and magnitude of the impacts identified above, implementation of the impact management activities provided in the Table 9.21 is recommended.

9.4.7. Residual impacts

The residual effects of the Project on the geological environment and land resources are expected to be negligible or negligible, provided that the above impact mitigation plans are implemented properly and on time.

Table 9.21. Measures to manage soil quality related impacts

İmpact type	Magnitude		Mitigation measures		Post-action magnitude	
			Environment	Description		
Soil removal	High		Construction sites	**1.** Making sure that only inevitably required volumes of topsoil are removed for the construction needs **2.** During removal of topsoil, preventing the soil from mixing with other materials used in construction **3.** Construction of special topsoil storage sites at certain intervals of the Project area to store topsoil after use pending the completion of the construction phase **4.** In order to prevent compaction and mineral loss of the soil stored at the above site, regular watering of and protection of the site from contamination, wind and water erosion **5.** Regular quality monitoring of the fertile soil stored in the above areas **6.** After the construction phase ends, use of stored fertile soil in the soil cover rehabilitation activities within and outside the Project area	Low	
Soil disturbance	High (construction phase)	Moderate (operation phase)	Planning and design	**1.** Ensuring that OHL routes minimize the need for extensive clearing and grading, avoiding sensitive areas such as wetlands, steep slopes, and prime agricultural lands **2.** Development of a comprehensive plan outlining measures to prevent soil erosion and sediment runoff during and after construction **3.** Development of a plan to minimize soil compaction **4.** Planning efficient transportation routes to minimize areas subject to the soil disturbance	Low (construction phase	Negligible (operation phase)

İmpact type	Magnitude	Mitigation measures		Post-action magnitude	
		Environment	Description		
			5. Providing shuttle services for workers to reduce individual vehicle commutes		
		Construction / maintenance sites	**1.** Implementation of the measures outlined in the erosion and sediment control plan, including installing and maintaining silt fences, sediment basins, and erosion control blankets **2.** Preventing soil compaction through limiting vehicle traffic to designated areas, using low ground pressure equipment when possible, and avoiding working on wet soils **3.** After the construction works finish, revegetation of the disturbed areas with native species to stabilize the soil and prevent further erosion **4.** Ensuring that all above precautions are undertaken to minimize soil disturbance during the operation phase		
		Monitoring	**1.** Regular inspection of the erosion and sediment control measures, making necessary repairs or adjustments **2.** Maintaining vegetation cover and control invasive species to ensure long-term soil stability **3.** Ensuring compliance with all relevant environmental regulations and permit requirements		
Soil contamination	High	Planning	**1.** Conducting of a thorough environmental site assessment to identify potential sources of contamination and assess the existing soil quality **2.** Development of a comprehensive plan outlining measures to prevent soil contamination during construction and operation phases	Low (construction phase)	Negligible (operation phase)

İmpact type	Magnitude	Mitigation measures		Post-action magnitude	
		Environment	Description		
			3. Establishment of protocols for preventing and responding to spills of hazardous materials, including the use of spill kits, containment barriers, and trained personnel **4.** Development of a plan for the proper handling, storage, and disposal of all waste generated during construction and operation, including hazardous waste		
		Construction / maintenance sites	**1.** Regular maintenance and inspection of all equipment to minimize the risk of leaks and spills **2.** Implementation of the spill prevention and response procedures, e.g. providing spill kits, and establishing designated spill response areas **3.** Implementation of the waste management plan to ensure proper handling, storage, and disposal of all waste generated during construction **4.** If soil contamination is identified, remediation of the contaminated soil in place using techniques such as bioremediation or chemical oxidation **5.** If unaffordable soil contamination is identified, removal of the contaminated soil and replacement of it with clean soil		
		Training / monitoring	**1.** Training of workers on spill response and waste management protocols **2.** Regular monitoring of the soil quality in areas where contamination is likely to occur **3.** Training the workers on the importance of fugitive emissions control, proper equipment operation, leak identification, and reporting procedures.		

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
			4. Conducting awareness campaigns to inform workers and nearby communities about the potential impacts of fugitive emissions and the mitigation measures in place **5.** After remediation / replacement of the contaminated soil cover, organization of a long-term monitoring of the soil quality	
Impacts from external sources	Moderate	Planning	**1.** To the extent possible, avoiding OHL routes and station locations from being too close to the sources of hazards, e.g. steep slopes and breccia fields of mud volcanos	Low
		OHL corridors Power stations	**1.** Planting and continuous maintaining of healthy vegetation cover in the project area to better protect soil from the impacts of external erosion **2.** In the areas close to the mountain slopes, building terraces on slopes to slow down water flow and reduce erosion **3.** Construction of drainage systems to help divert excess water away from vulnerable areas and prevent soil erosion **4.** Creating retention ponds to capture the runoff water, allowing sediment to settle before the water is slowly released **5.** Using permeable pavements to let water to infiltrate the ground, reducing runoff and recharging groundwater **6.** Continuous monitoring of mud volcano activity **7.** Developing hazard maps to identify areas at risk	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
			8. Wherever possible, deploying engineering solutions such as diversion channels or barriers to redirect mudflows away from the key Project facilities	

9.5. Water Quality

9.5.1. Scope of Assessment

OHL construction and operation projects can have various impacts on water quality, both during construction and throughout the operational lifespan. Potential impacts on water resources are among the most important potential environmental impact categories. The current chapter will analyze the results of the project's potential impacts on surface and underground water sources, and make suggestions on how to prevent or minimize the identified adverse impacts.

Geographical scope of the soil impact assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations. The assessment period covers both the construction and operation phases. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “5.6 Hydrology and surface water resources” section of the EBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.5.2. Sources and Sensitive Receptors

Below are the primary sources of water quality-related impacts in the context of the AZURE Project:

A. Construction phase:

1. Soil erosion and sedimentation:

- Land Clearing and Grading: The removal of vegetation and disturbance of soil during site preparation and access road construction can expose bare soil to erosion. Rainfall can then wash sediment into nearby water bodies, increasing turbidity, smothering aquatic habitats, and affecting aquatic life.
- Excavation and Trenching: Digging foundations for OHL towers and other Project facilities, and trenching for underground cables can further contribute to the transportation of eroded and sedimented soils to the water resources.
- Stockpiles and Construction Materials: Exposed stockpiles of soil, sand, gravel, or other construction materials can be sources of sediment runoff during rainfall.

2. Spills and Leaks:

- Fuel and Chemical Spills: Accidental spills or leaks of fuels, lubricants, hydraulic fluids, or other chemicals used in construction equipment and vehicles can contaminate surface water and groundwater.
- Concrete Washout Water: The wastewater generated from cleaning concrete equipment and tools can contain high levels of pH, suspended solids, and other pollutants that can harm aquatic life.

3. Wastewater Discharge:

- Sanitary Wastewater: Improperly treated wastewater from worker camps or temporary facilities can introduce pathogens and nutrients into water bodies, leading to eutrophication and potential health risks.

B. Operation phase:

1. Erosion and Sedimentation:

- Access Roads: Unpaved access roads under the OHL and other Project facilities can continue to be sources of erosion and sedimentation, especially during heavy rainfall or snowmelt.
- Maintenance Activities: Routine maintenance activities, such as vegetation control or equipment access, can disturb soil and trigger erosion.

2. Herbicide Use:

- Runoff and Leaching: Herbicides used to control vegetation under the OHL can run off into nearby water bodies or leach into groundwater, potentially impacting aquatic life and drinking water sources.

3. Accidental Spills:

- Transformer Oil: Leaks from older transformers containing polychlorinated biphenyls (PCBs) can contaminate water bodies and pose long-term environmental and health risks.

Sensitive receptors of the above impact types were identified as follows:

- ***Workers*** - construction workers and maintenance personnel involved in the Project are at a higher risk of exposure to water contamination due to their direct contact with the water sources
- ***Water users*** – the main impact receptors, whose livelihoods and welfare is largely dependent on the availability and quality of water resources
- ***Ecosystems*** – key receptor category, represented by river and terrestrial ecosystems, plants and animals – all highly dependent on the availability of fresh clean water.

C. Project standards

The Water Quality standards of the Project are generally based on the drinking water quality standards adopted by Azerbaijan (Paragraph 3.13.1). However, as a number of quality parameters of the monitored water sources do not meet nationally accepted MACs, and, as the Project doesn't aim to bring those

quality parameters to the required level, proposed impact prevention and mitigation measures will aim to avoid further worsening of the quality of water sources in the Project area.

9.5.3. Assumptions and Limitations

The water quality assessment was implemented based on the following assumptions and limitations:

A. Assumptions

- The project design, including the proposed OHL route, tower locations, construction methods, and erosion control measures, is accurate and will be strictly followed during implementation. Deviations could alter the predicted impacts on water quality.
- Appropriate BMPs for erosion control, spill prevention, and wastewater management will be implemented effectively throughout the project lifecycle
- Construction materials, such as herbicides and concrete, will meet quality standards and not pose unforeseen contamination risks
- The assessment assumes a specific hydrological regime for the receiving water bodies. Changes in water levels, flow rates, or other hydrological parameters could influence pollutant dilution and transport
- The assessment uses existing water quality data to establish baseline conditions. However, these data may not be fully representative of all seasons or potential variations in water quality.
- The assessment may not fully account for the cumulative impacts of the OHL project in combination with other existing or planned activities in the watershed that could affect water quality.

B. Limitations:

- Limited availability of detailed water data, especially in remote areas, can hinder the accuracy of the assessment.
- Predicting long-term impacts on water quality is challenging due to the complex interactions between pollutants, aquatic ecosystems, and changing environmental conditions
- Accidental spills, equipment failures, or extreme weather events can occur unexpectedly, causing water contamination that may not be captured in the assessment
- The effectiveness of mitigation measures relies on consistent monitoring and adaptive management to address unforeseen impacts
- The assessment may not fully account for the cumulative impacts of the Project in combination with other existing factors that could affect water quality.

9.5.4. Identified water quality impacts

Considering that the water requirements of the project will be met by external sources, the only potential water quality related impacts of the Project will be water contamination by described in Section 9.5.2.

1. Migration of soil erosion and sedimentation material

The migration of soil erosion and sedimentation material has a significant and multifaceted impact on river water quality. These impacts can be classified as follows:

1. Physical Impacts:
   - Eroded soil particles suspended in water increase turbidity (cloudiness), reducing light penetration and affecting aquatic plant growth and photosynthesis.
   - Deposited sediment can smother benthic habitats, clog waterways, and reduce the capacity of reservoirs. This can impact fish spawning grounds, alter river morphology, and increase flood risk.
   - Sediment can alter the heat absorption and reflection properties of water, leading to temperature changes that can affect aquatic life.

2. Chemical Impacts:
   - Eroded soil often carries nutrients like nitrogen and phosphorus, leading to eutrophication (excessive nutrient levels) in rivers. This can cause algal blooms, oxygen depletion, and harm aquatic life.
   - Sediments can adsorb and transport pollutants like pesticides, heavy metals, and other toxins, contaminating water sources and potentially entering the food chain.
   - Depending on the composition of the eroded soil, it can alter the pH of the water, potentially making it unsuitable for certain aquatic organisms.

3. Biological Impacts:

   - Sedimentation and changes in water quality can disrupt aquatic habitats, impacting fish populations, invertebrates, and other aquatic life.
   - The combined effects of physical and chemical changes can lead to a decrease in biodiversity as sensitive species are unable to survive in the altered environment.
   - Eroded soil can carry pathogens like bacteria and viruses, posing a health risk to humans and animals that use the river for drinking or recreation.

2. Contamination of water by spills, leaks and waste

Contamination of water by spills, leaks, and waste has devastating and far-reaching impacts on the environment, ecosystems, and human health. The specific effects depend on the type and amount of contaminants, but some general impacts include:

- **Water Pollution**: Spills, leaks, and waste introduce harmful substances like chemicals, heavy metals, and pathogens into water bodies, making them unsafe for drinking, irrigation, and recreation

- **Ecosystem Disruption**: Contaminants can poison aquatic life, leading to fish kills, algal blooms, and disruptions in the food chain. This can ultimately harm entire ecosystems and reduce biodiversity
- **Soil Contamination**: Spills and leaks can seep into the soil, contaminating groundwater and affecting plant growth. This can make the land unusable for agriculture or other purposes.

Summary of the described soil related impacts of the Project is provided in the Table 9.22 below.

Table 9.22. Surface water quality related impacts of the Project

Soil erosion and sedimentation	
Impact	Migration of soil erosion and sedimentation material to the water bodies of Kur, Alijanchay, Turyanchay, Goychay, Girdimanchay, Aghsuchay and Pirsaat rivers, and to the irrigation canals
Receptor sensitivity	**High – workers, water users, ecosystems**
Impact parameters	- The impact is indirect - The impact is mainly midterm for being mainly expected during the construction phase, but may last throughout the project lifetime - The impact is regional as it can spread far beyond the Project area and cover downstream of the affected water bodies - Likelihood of the impact is high during construction phase, and moderate during operation phase, unless impact prevention measures are taken - Impact magnitude is high
Impact importance	**Importance of the impact is high**
Water contamination	
Impact	Contamination of water bodies by spills, leaks, and waste
Receptor sensitivity	High – all receptor categories
Impact parameters	- The impacts are direct - The impacts are long-term as they can be expected throughout the project lifetime - The impact is regional as it can spread far beyond the Project area and cover downstream of the affected water bodies - Likelihood of the impact is moderate, unless precaution measures are taken - Impact magnitude is high for all receptor categories
Impact importance	**Importance of the impact is high**

9.5.5. Proposed mitigation measures

In order to prevent an increase in the volume and magnitude of the impacts identified above, implementation of the impact management activities provided in the Table 9.23 is recommended.

9.5.6. Residual impacts

The Project is likely to have no residual impacts on water resources, provided that the below impact mitigation measures are implemented properly and on time.

Table 9.23. Measures to manage water quality related impacts

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
Migration of erosion and sedimentation material	High (construction phase)	Low (operation phase)	Construction sites Riverbanks	**1.** Implementation of the soil impact mitigation measures, as described in the Table 9.18 above **2.** Retaining existing vegetation whenever possible, as it acts as a natural barrier against erosion **3.** Revegetation of disturbed areas promptly with native grasses and plants to stabilize the soil **4.** Design and implement effective stormwater management systems to collect, divert, and treat runoff before it enters rivers **5.** Installation of erosion control structures such as silt fences, sediment basins, check dams, and fiber rolls to trap sediment before it reaches waterways **6.** Stabilization of slopes using techniques like terracing, retaining walls, or geotextile fabrics to prevent erosion on steep terrain	Low
			Monitoring	**1.** Conducting regular inspections of erosion control measures and drainage systems to ensure their effectiveness and make necessary repairs or adjustments **2.** Regular removal of accumulated sediment from sediment basins and traps to maintain their functionality **3.** Monitoring the water quality in affected rivers and streams to assess the effectiveness of mitigation measures and identify potential issues early on.	

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
Water contamination	High (construction phase)	Moderate (operation phase)	Planning and design Construction/operation sites Waterflows	**1.** Implementation spill prevention and response plans for all hazardous materials used during construction and operation **2.** Ensuring proper treatment and disposal of wastewater from construction camps and maintenance activities **3.** Using herbicides judiciously, following best management practices to minimize runoff and leaching (considering alternative vegetation control methods is appreciated) **4.** In case the water contamination is identified, taking urgent action to remove its consequences according to the best and most expedient practices.	Negligible
			Monitoring	**1.** Regular monitoring of the water quality in affected water bodies to detect any signs of contamination and take corrective action promptly **2.** Ensuring compliance with all relevant environmental regulations and permit requirements	

9.6. Biodiversity

9.6.1. Scope of assessment

Impacts on biodiversity are among the critical potential impact categories of the AZURE Project, as the Project, although occupying a rather narrow strip of lands, extends for around 300 km crossing the large number of ecosystems and bird migration routes, and running near the boundaries of 2 natural protected areas.

Geographical scope of the biodiversity impact assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations, and the territories of adjoining key ecosystems. The assessment period covers both the construction and operation phases. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in "6.11 Biodiversity" section of the EBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.6.2. Sources and Sensitive Receptors

Overhead transmission line (OHL) construction and operation projects can significantly impact biodiversity through various sources, including:

1. Construction Phase:
   - Clearing land for OHL tower placement and access roads may cause loss and fragmentation of habitats
   - Soil excavation and grading will disrupt the soil's structure, leading to erosion and sedimentation in the waterways affecting aquatic ecosystems
   - Noise, human presence, and machinery operation can cause displacement of wildlife, disruption of breeding cycles, etc.
2. Operation phase:
   - Operation of powerlines is accompanied by collision and electrocution risks for birds. In the case of the AZURE-supported high-voltage lines, bird collisions are the main risk.
   - The presence of power lines and associated infrastructure can alter microclimates and vegetation patterns

- Access roads created during construction can facilitate human encroachment into previously undisturbed areas

The following sensitive receptor categories of the Project impacts were identified:

- **Flora**: The Project's land footprint will locally affect plants growing in the Shirvan lowland, particularly the semi-desert and steppe vegetation types along the transmission line corridor. This could include limited habitat loss, fragmentation, and disturbance during construction and operation.
- **Terrestrial fauna**: Azerbaijan provides breeding and wintering habitats, along with key migration corridors (including the Shirvan lowlands and Caspian Sea coast), for a rich diversity of bird species, some of which are globally threatened. Power lines, (including the AZURE-supported new transmission lines) pose a fatal collision risk to birds that accidentally fly into them. Large, heavy-bodied birds are particularly vulnerable to such collisions. Raptors (birds of prey) are also vulnerable to electrocution when they attempt to perch on power distribution lines (and simultaneously touch a grounded and an electrified element, or two electrified elements); however, this impact is highly unlikely with the specific types of pylons to be used for the AZURE transmission lines. Other wildlife such as reptiles and small mammals could be locally impacted by habitat loss and disturbance during construction.
- **Aquatic fauna**: The project will cross or run near rivers and the important Varvara Wetland, potentially impacting water quality through sediment runoff during construction or accidental spills during operation.
- **Protected Nature Areas**: Proximity of the Project area to Turyanchay State Nature Reserve and Shirvan National Park makes it important to minimize impacts on these ecologically sensitive areas.

All sited receptor categories are characterized by high sensitivity against adverse biodiversity related impacts of the Project. This could involve careful route selection, mitigation measures to minimize harm to migratory birds and other wildlife, and monitoring to ensure compliance with environmental requirements.

9.6.3. Project standards

The ESF WB ESS 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources is considered as a project standard for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA.

9.6.4. Assumptions and limitations

Theassessment was implemented based on the following assumptions and limitations:

A. Assumptions

- It is assumed that proposed mitigation measures will effectively reduce or offset negative impacts. However, their actual effectiveness may vary depending on implementation, monitoring, and unforeseen circumstances
- It is assumed that there is a linear relationship between the extent of impact and the effectiveness of mitigation. However, in reality, some impacts might be irreversible or have threshold effects where mitigation becomes less effective beyond a certain point

B. Limitations:

- The assessment is based on the limited baseline data available, including data from the bird surveys carried out to date as part of the ESIA. Key bird migration routes are themain biodiversity feature that could be affected by project activities.
- The assessment was constrained by the spatial extent of the Project area and the tough timeframe of the assessment. This may not capture broader ecosystem dynamics and long-term ecological changes. To better address potential impacts on migratory species, seasonal ornithological and sensitive bird habitat studies were implemented in autumn 2024, and the study outcomes were used to develop mitigation measures proposed in this report . Additional studies will be implemented in spring-summer 2025 in the areas of both ornithology and sensitive/critical habitats. Results of these additional studies will be incorporated in this ESIA, ESMP and BMP.
- Limited data on species, habitats, or ecological processes can lead to uncertainties in impact assessment
- The assessment prioritizes direct impacts (e.g., habitat loss, collision) over indirect and cumulative impacts (e.g., changes in predator-prey dynamics, habitat fragmentation)

9.6.5. Identified impacts

1. Habitat Loss

Overhead transmission line (OHL) projects can lead to significant habitat loss and fragmentation in forest and woodland areas. However, the AZURE supported OHLs will pass almost entirely through open habitats: Grassy or shrubby steppe, semi-desert, and cultivated lands, along with the marshy Varvara wetland. Accordingly, few if any trees will need to be removed to accommodate the Project OHLs. Habitat loss under this Project will mostly be limited to the relatively small footprints of each pylon, the substations, any new (rather short) access roads and tracks, and construction staging areas.

2. Soil disturbance and erosion

Excavation and grading activities disrupt soil structure, sometimes leading to erosion and sedimentation in nearby water bodies, affecting aquatic biodiversity. Soil disturbance and erosion resulting from OHL construction projects can have negative impacts on biodiversity sometimes including:

- **Direct Habitat Loss**: Soil disturbance destroys the habitats of soil organisms such as bacteria, fungi, insects, and other invertebrates, which play crucial roles in nutrient cycling, decomposition, and soil fertility.
- **Loss of Plant Diversity**: Erosion removes topsoil, which is rich in nutrients and organic matter necessary for plant growth. This loss of fertile soil can lead to the decline of native plant species and reduce overall plant diversity.
- **Disruption of Food Webs**: The loss of soil organisms and plant diversity disrupts food webs and ecological relationships. For example, the decline of insect populations can impact birds and other animals that rely on them for food.
- **Increased Vulnerability to Invasive Species**: Disturbed soils are more susceptible to invasion by non-native plant species, which can outcompete native plants and further alter ecosystems.
- **Sedimentation of Water Bodies**: In the absence of adequate erosion control and/or sediment capture measures, soil erosion can lead to the sedimentation of rivers, lakes, and streams. This sedimentation can smother aquatic habitats, reduce light penetration, and harm fish and other aquatic organisms.
- **Indirect Impacts on Wildlife**: Soil disturbance and erosion can indirectly impact wildlife by reducing the availability of food and shelter. For example, the loss of vegetation cover can expose animals to predators and reduce the availability of nesting sites.

3. Disturbance to wildlife

Noise, human presence, and machinery operation can displace wildlife, disrupt breeding cycles, and increase stress levels, potentially leading to mortality or reduced reproductive success. Construction activities can create noise pollution, disturbing wildlife behavior and communication. Additionally, artificial lights at substations can disrupt nocturnal animals and disorient migrating birds. However, aircraft warning lights are not required and will not be installed on the Project OHL pylons, except where adjacent to an airport.

The Project OHLs pass through or near several important bird nesting areas, including the marshy Varvara Wetland and several hills with nearby raptor nests; these power line segments are specifically noted in Table 6.15. To avoid disturbance to nesting raptors and waterfowl, the Project will enforce time-of-year restrictions on construction activities, which will be prohibited during the overall bird nesting season of 1 April-31 July.

In the case of the Papadagh (Table Mountain) site (SA4 in Table 6.15), the new 500 kV OHL will pass about 100 meters from the base of a rocky hill with a long-used nest site of Saker Falcon *Falco cherrug* (globally Endangered)—one of only two known nests in Azerbaijan. The nest site is high on the hill (well above the

height of the planned pylons). The new line will be on the opposite side of the existing paved road from the hill. To help ensure continued successful nesting at this site, the Project will (i) require that no pylons be placed in front of the hill (but rather, well to either side of the hill); (ii) prohibit construction there during the nesting season (1 April-31 July); (iii) install bird flight diverters on both the conducting and grounding wires, in front of the hill and to the second pylon from either side of the hill (total 3 segments between 4 pylons); and (iv) periodically monitor falcon nesting activity and success at the site.

4. Bird Collisions

- Power lines, (including the AZURE-supported new transmission lines) pose a fatal collision risk to birds that accidentally fly into them. Large, heavy-bodied birds are particularly vulnerable to such collisions. In Azerbaijan, the birds considered to be most vulnerable to power line collisions are (i) Little Bustards *Tetrax tetrax*, for which Azerbaijan is a globally significant wintering ground; (ii) large wetland birds such as storks, flamingos, cranes, pelicans, swans, geese, and ducks; and (iii) raptors including vultures, eagles, hawks, and falcons. However, bats (specifically the small, echolocating species found in Azerbaijan) are not known to collide with power lines, even though they collide frequently with wind turbine blades.

- Power line collisions are especially problematic for migratory or resident bird species with slow reproductive rates, or those already facing population declines from other causes. These collisions have been found to cause significant mortality for some bird species, such as bustards. Collisions can further exacerbate the decline of threatened species, thereby hindering conservation efforts.

Factors influencing bird collision risks include the following:

- **Line Visibility**: OHLs that are difficult for birds to see, such as those in foggy areas or against a bright sky, pose a higher collision risk.
- **Flight Paths**: OHLs located in areas with high bird activity, such as migratory corridors or near wetlands, have a greater potential for collisions.
- **Bird Behaviour**: Some bird species are more prone to collisions due to their flight patterns, foraging behaviors, or visual acuity.
- **Pylon Design**: The design of OHL pylons can influence collision risks. Such risks are lower when all the conducting wires are on one horizonal plane. This is the case for the AZURE-supported 500 kV line (Mingachevir-Navahi).
- **Line Markings:** In particular, marking wires with bird flight diverters (BFDs) makes them more visible to most birds (although generally not bustards), thereby reducing collisions. BFD models include

flappers, spirals, and Fireflies (a brand name). BFDs are highly visible devices that rotate or flap in the wind and sometimes reflect sunlight, making them easier for birds to detect and avoid. BFDs often have bright colors (such as fluorescent yellow and orange) that contrast with the natural background, further enhancing their visibility. They can also incorporate glow material that absorbs ultraviolet light, making them visible to birds that can see in the ultraviolet spectrum. BFD installation is planned in the more sensitive sections of the Project OHL; these are listed in Table 6.15.

5. Electrocution risks

Larger birds—especially raptors such as vultures, eagles, hawks, falcons, and owls--are vulnerable to electrocution when they attempt to perch on power poles and simultaneously touch a grounded and an electrified element, or two electrified elements. This impact is much more common on lower-voltage distribution lines (where perched birds are often within easy contact of electrified wires) than on high-voltage transmission lines. One electrocution scenario that sometimes occurs with high-voltage transmission lines is when large birds (especially vultures) perched on a pylon defecate directly onto a conducting wire below them; these “streamers” of liquid excrement can conduct electricity, thereby electrocuting the bird. However, this impact is considered very unlikely with the specific pylon designs to be used for the AZURE transmission lines. This is because the distance from the possible perch area down to the underneath conducting wire will be about 6 meters for the 500 kV OTL and 4.5 meters for the 330 kV OTL—greater than the normal length of streamers.

6. Indirect Effects

Power line access roads created during construction can facilitate human encroachment onto previously remote areas, leading to poaching and wildlife disturbance, along with the introduction of invasive plant species. In the AZURE Project, these risks are relatively minor because most of the OTL alignments are close to existing roads and tracks.

A summary of the biodiversity impacts is provided in the Table 9.24 below.

Table 9.24. Biodiversity related impacts of the Project

Habitat loss and fragmentation	
Impact	Loss of habitats due to clearing of vegetation and erection of OHL towers
Receptor sensitivity	Low – all receptor categories
Impact parameters	- The impacts are direct - The impacts are long-term - - Likelihood of the impacts is high - Impact magnitude is low
Impact importance	Importance of the impacts is low
Soil disturbance and erosion	
Impact	Impacts on aquatic biodiversity due to the disruption of soil by excavation and grading works
Receptor sensitivity	High – aquatic ecosystems
Impact parameters	- The impact is indirect - The impact is mainly midterm for being mainly expected during the construction phase, but may last throughout the project lifetime - The impact is regional as it can spread far beyond the Project area and cover downstream of the affected water bodies - Likelihood of the impact is high during construction phase, and moderate during operation phase, unless impact prevention measures are taken - Impact magnitude is moderate
Impact importance	Importance of the impact is moderate
Disturbance to wildlife	
Impact	Disturbance to wildlife caused by noise, human presence and machinery operation
Receptor sensitivity	High – terrestrial animals

Impact parameters	- The impact is direct - The impact is short-term, during the construction period - The impact is local as it will be imposed within the construction and operation sites - Likelihood of the impact is high during the construction phase and low during the operation phase - Impact magnitude is high
Impact importance	Importance of the impact is high
Collision risks	
Impact	Collision of birds with overhead transmission lines
Receptor sensitivity	- High -
Impact parameters	- The impact is direct - The impact is long-term as it can be expected throughout the project lifetime - The impact is regional as it will be imposed within the whole length of the OHL corridors - Likelihood of the impact is high - Impact magnitude is high
Impact importance	Importance of the impact is high
Electrocution	
Impact	Electrocution of large birds with wide wingspans when perching or flying near power lines.
Receptor sensitivity	High – large birds
Impact parameters	- The impact would be direct - The impact would be long-term (throughout the project lifetime) if it were to exist - The impact would be regional, along the whole length of the OHL corridors - Likelihood of the impact is very low with the pylon designs to be used for the AZURE Project

	- Impact magnitude would be high if it existed
Impact importance	Importance of the impact is expected to be low for this Project
Indirect effects	
Impact	Human encroachment into previously undisturbed areas
Receptor sensitivity	Moderate – all receptors, except for those inhabiting the protected nature areas
Impact parameters	- The impact is indirect - The impact is long-term as it can be expected throughout the project lifetime - The impact is local - Likelihood of the impact is low, as there is a human presence in most parts of the Project area - Impact magnitude is moderate
Impact importance	Importance of the impact is moderate

9.6.6. Proposed impact mitigation measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in Table 9.25 is recommended.

9.6.7. Residual impacts

As a result of the below mitigation measures, the severity of the Project's identified impacts on biodiversity is expected to be significantly lower.

Table 9.25. Measures to manage biodiversity related impacts

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
Loss, and alternation of habitats	High		Construction and operation sites	**1.** Minimizing the construction of new access roads **2.** Avoiding clearing vegetation during nesting and breeding seasons for birds and other wildlife **3.** Using selective clearing techniques to retain important vegetation features **4.** Implementation of revegetation plans that prioritize native plant species to restore habitat diversity and ecological function **5.** Restoring disturbed areas by replanting native vegetation and reconnecting fragmented habitats with corridors or stepping stones. **6.**	Low
			Monitoring / management	**1.** Monitoring the effectiveness of mitigation measures and the long-term impacts of OHLs on biodiversity. **2.** Adapt management practices as needed to address any unforeseen impacts and ensure the continued protection of habitats and wildlife **3.**	
Soil disturbance and erosion	High (construction phase)	Moderate (operation phase)	Construction and operation sites	**1.** Implementation of mitigation measures, proposed in the Table 9.18 (soil quality impact mitigation) and Table 9.20 (water quality impact mitigation)	Low

İmpact type	Magnitude		Mitigation measures		Post-action magnitude	
			Environment	Description		
Disturbance to wildlife	High (construction phase)	Moderate (operation phase)	Planning	**1.** Implementation of continuous thorough surveys to identify wildlife species present in the project area, their habitats, and any critical corridors or sensitive areas. **2.** Designing OHL corridors and access roads with the smallest possible footprint to reduce the disturbance	Low (construction phase)	
			Construction sites	In the special case of the Saker Falcon *Falco cherrug* nesting area at Papadagh (Table Mountain) the Project will (i) require that no pylons be placed in front of the hill (but rather, well to either side of the hill); (ii) prohibit construction there during the nesting season (1 April-31 July); (iii) install bird flight diverters on both the conducting and grounding wires, in front of the hill and to the second pylon from either side of the hill (total 3 segments between 4 pylons); and (iv) periodically monitor falcon nesting activity and success at the site. **1.** Scheduling construction activities outside of breeding and nesting periods (1 April-31 July) **2.** Implementation of measures to reduce noise and light pollution during construction **3.** Establishing buffer zones around sensitive habitats to minimize disturbance and provide refuge for wildlife **4.** Limiting construction activities to designated areas and minimizing noise and light pollution to reduce stress on wildlife **5.** If nests are encountered at the construction sites, avoiding their disturbance by erecting special fences **6.** Training construction personnel on wildlife awareness, including non-lethal and safe relocation of slow-moving wildlife such as snakes and turtles		

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Operation sites	**1.** Implementation of vegetation management plans that prioritize native plant species and avoid clearing vegetation during critical periods for wildlife. ***2.*** Monitoring wildlife populations and their responses to OHLs to identify any negative impacts and adjust management practices as needed, with special emphasis on wintering Little Bustards *Tetrax tetrax*	
Collision and electrocution risks	High	Planning	**1.** Conducting bird flight path studies to identify areas with high bird activity and potential collision risk **2.** In the areas crossing key bird migration routes (specified in Table 6.15), implementation of detailed onsite bird pattern studies during the spring migration period (March to May 2025), with subsequent updating of the known sensitive locations and corresponding mitigation measures	Low
		OHL design and marking	**1.** Marking OHL wires with bird flight diverters (flapper, firefliy, or spiral design) with contrasting colors or patterns to increase visibility to flying birds, especially in the identified sensitive areas (indicated in Table 6.15) **2.** The pylons to be used for the 330 kV and the 500 kV OTLs will have ample spacing between conductors and grounded components, thereby preventing birds from being electrocuted. **3.** Using insulated conductors and covered jumpers to reduce the risk of contact with energized parts	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Inspection and monitoring	**1.** Regular inspection of OHLs for damaged or worn components, especially bird flight diverters that may need to be replaced **2.** Prompt repair or replacement of any damaged components to maintain the safety of the line **3.** Monitoring the bird activity and collision rates to assess the effectiveness of mitigation measures, with special emphasis on the Little Bustard *Tetrax tetrax*. **4.** Adapting the management strategies as needed, based on monitoring data to ensure continuous improvement	Low
Indirect effects	Moderate	Operation sites	**1.** Preventing the introduction and spread of invasive species through proper hygiene practices during construction and ongoing monitoring and control **2.** Considering the potential indirect effects of the OHL project on local communities, such as changes in land use, access to resources, and economic opportunities **3.** Supporting research to better understand the complex ecological relationships and potential indirect impacts of OHLs on the environment	Negligible

9.7. Wastes

9.7.1. Scope of assessment

Waste management is a high-priority issue to be considered when planning and implementing any activity, including energy production and transmission projects. This section assesses potential waste related impacts of the AZURE Project, and suggests impact mitigation activities.

Geographical scope of the waste related impact assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations. The assessment period covers both the construction and operation phases. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “5.10 Waste management” section of the EBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.7.2. Sources and Sensitive Receptors

Project related sources of the potential waste related impacts are as follows:

A. Construction phase

- **Excavation and Clearing**: Generates large quantities of soil, vegetation, and rock debris. Improper disposal can lead to soil erosion, habitat destruction, and water pollution.
- **Construction Materials**: Excess materials like concrete, wood, and metal scraps can contribute to landfill waste if not managed properly.
- **Packaging Waste**: Packaging from construction materials and equipment can accumulate and contribute to litter if not recycled or disposed of correctly.
- **Hazardous Waste**: Construction activities may generate hazardous waste such as used oils, solvents, paints, and batteries, which require specialized handling and disposal to prevent environmental contamination.

B. Operation phase

- **Maintenance Waste**: Ongoing maintenance generates waste like used insulators, conductor scraps, and replaced equipment components.

- **Vegetation Management**: Trimmings from vegetation management activities under and around lines can accumulate and become fire hazards if not disposed of properly.
- **End-of-Life Waste**: When OHL towers and lines reach the end of their lifespan, the decommissioning process generates significant waste from the removal of towers, conductors, and other infrastructure.

Sensitive receptors of the project's potential waste related impacts are represented by vegetation, water, and land resources of the Project area, as well as the local communities, land users, farmers and tourists. All receptor categories are characterized by high sensitivity level.

9.7.3. Project standards

The ESF WB ESS 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources is considered as a project standard for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA.

9.7.4. Assumptions and limitations

The waste related impact assessment was implemented based on the following assumptions and limitations:

A. Assumptions

- The assessment rely on estimated data for waste generation rates, composition, and disposal methods. However, given the shortage of data on the specific expected waste volumes and composition, these estimates do not accurately reflect the actual waste to be generated during the Project
- It is assumed that there is a linear relationship between project size and waste generation. However, waste generation can be influenced by various factors, such as project complexity, construction methods, and waste management practices, which may not scale linearly
- It is assumed that waste management practices will be implemented as planned. However, unforeseen circumstances or changes in project management may lead to deviations from the planned waste management approach.
- The assessment used environmental impact models to assess the potential impacts of waste on the environment. These models may have limitations in capturing the full complexity of waste interactions with the environment, particularly in the long term.

B. Limitations:

- The assessment is made based on the limited volumes of Project waste data available

- The assessment primarily focused on quantifiable impacts of waste, such as waste volumes, landfill space, and greenhouse gas emissions. It may not adequately address qualitative impacts, such as visual pollution, odor nuisance, or social impacts associated with waste management facilities.
- The assessment inherently involve uncertainty due to the reliance on estimated data, the complexity of waste generation and disposal processes, and the variability of environmental conditions. This uncertainty can limit the accuracy and reliability of the assessment results.
- The assessment focuses on the direct impacts of waste generated during construction and operation. It may not fully consider indirect impacts, such as the environmental footprint of waste transportation, the energy consumption of waste treatment processes, or the potential for secondary pollution from waste disposal.
- The assessment lacks a long-term monitoring component to assess the effectiveness of mitigation measures and track the actual environmental impacts of waste over time.

9.7.5. Identified impacts

Based on the waste discharge sources described above, the following potential waste related impacts of the Project were identified and assessed:

1. Excavated soil, vegetation and rock debris

Excavated soil, a common waste product of OHL construction, is a diverse mixture depending on the site's geology. It can range from topsoil and subsoil to clay, sand, gravel, and potentially contaminated soils from past industrial use. Due to extensive excavations for foundations, access roads, and tower basements, it will constitute the largest waste stream of the Project. If not managed properly, it can erode, degrade soil fertility, and release contaminants.

Vegetation debris, another significant waste type, encompasses cleared trees, shrubs, grasses, and other plant material. Its volume is particularly high in densely vegetated areas. This debris poses fire hazards when dry, disrupts wildlife habitats, and releases methane, a potent greenhouse gas, during decomposition. As the OHL construction sites are mostly free of tall vegetation, the waste stream from this source is not expected to be large.

Rock debris, including boulders and rock fragments, varies in volume based on the site's geology. It can cause landslides in hilly terrain if disposed of improperly, modify habitats by altering drainage patterns, and create visually unappealing landscapes.

In most cases, the wastes produced as a result of excavation, slope cutting and land clearing activities will represent a heterogeneous mixtures of materials, making them difficult to handle and process. Their large volume and size present logistical challenges for storage, transportation, and disposal.

To manage these waste streams effectively, thorough characterization is necessary to identify potential contaminants and assess their suitability for reuse or recycling. Segregation of different waste types — soil, vegetation, and rock — will facilitate appropriate management and disposal. Reuse and recycling should be explored, such as using excavated soil for landscaping, composting vegetation debris, and repurposing rock debris for construction. For waste that cannot be reused or recycled, disposal in designated landfills or approved facilities is crucial, ensuring compliance with environmental regulations.

2. Construction waste

Being an unavoidable aspect of OHL projects, construction waste encompasses various materials, such as wood, metal, concrete, plastics and packaging waste, with distinct characteristics and environmental impacts.

Wood waste originates from timber, plywood, and engineered wood products used in formwork, scaffolding, packaging, and temporary structures. Its volume can be substantial, particularly in projects with extensive temporary setups. If not reused or recycled, wood waste can occupy valuable landfill space and release methane, a potent greenhouse gas, during decomposition.

Metal waste (steel, aluminum, copper, and other metals from rebar, fasteners, wiring, and equipment components), varies in volume depending on the project's scale and complexity. The production of these metals demands significant energy and resources, and their disposal as waste can contribute to landfill volume and potential environmental contamination if not handled properly.

Concrete and masonry waste (concrete, bricks, blocks, and mortar from foundations, tower bases, etc.) often constitute a significant portion of the construction waste, especially in projects with large concrete elements. Concrete waste takes up considerable space in landfills, is difficult to break down, and its demolition and crushing generate dust and emissions that impact air quality.

Plastics and packaging waste (including plastic films, packaging materials, pipes, and other plastic components) can be substantial due to the widespread use of plastics in construction. This type of waste takes a long time to decompose, can leach harmful chemicals into the environment, and contributes to pollution, with plastic debris often ending up in waterways and oceans, harming marine life.

Construction waste, in general, is characterized by its heterogeneity, consisting of a mixture of materials with different properties, making it challenging to manage and process. It's often bulky, requiring specialized equipment for handling and transportation. Additionally, the composition and volume of waste vary depending on the project's type, size, and construction methods.

Effective management of construction waste necessitates prioritizing waste reduction through careful planning, material optimization, and the use of reusable or recyclable materials. Implementing efficient sorting and separation processes is crucial to maximize recycling and recovery of valuable materials. Establishing partnerships with recycling facilities and exploring opportunities to reuse materials on-site or in

other projects can further minimize waste. For non-recyclable waste, proper disposal in designated landfills or approved facilities is essential, ensuring compliance with environmental regulations.

3. Industrial waste

Industrial waste, a consequence of OHL construction and operation, encompasses a range of hazardous and non-hazardous materials, each posing distinct challenges.

Hazardous waste, including used oils, solvents, paints, batteries, and other chemicals used in construction and maintenance, is typically small in volume compared to other waste streams. However, its toxicity and potential for contamination pose significant environmental risks. If not disposed of properly, it can pollute soil and groundwater, release harmful vapors into the air, and cause serious health problems for workers and the public.

Being one of the most critical hazardous industrial waste types, oils and fuels originating from used engine oil, hydraulic fluid, and other petroleum-based products used in construction equipment and vehicles, may vary in volume depending on the construction's scale and machinery. Their accidental spills or leaks can severely contaminate soil and water, harming aquatic life and rendering water sources unusable. Accumulated oils and fuels also pose a fire hazard. Chemicals, encompassing cleaning agents, solvents, paints, herbicides, and other substances used in construction and maintenance, are usually smaller in volume but pose significant environmental risks due to their toxicity. Many chemicals are harmful to aquatic life and can disrupt ecosystems, while some persist in the environment, accumulating in soil and water over time, creating long-term risks.

Non-hazardous industrial waste includes materials contaminated with hazardous substances during construction or maintenance activities, asbestos-containing materials from older structures, and electronic waste from discarded equipment. This category also encompasses scrap metal, used tires, and other materials generated during OHL projects.

Industrial waste is characterized by its toxicity, complexity, and stringent regulatory requirements for handling, storage, transportation, and disposal. Many industrial wastes contain hazardous substances that can harm human health and the environment, while the complex mixture of various materials makes it challenging to characterize and manage properly.

To effectively manage industrial waste, the Project must prioritize waste minimization through strategies such as using less hazardous materials, optimizing processes, and preventing spills and leaks. Proper identification and segregation of different types of waste is crucial to ensure appropriate handling and disposal. Engaging licensed hazardous waste disposal companies is essential for safe and compliant disposal of hazardous materials. Additionally, exploring options for treating or recycling certain industrial waste streams can recover valuable materials and reduce the amount of waste sent to landfills. Maintaining detailed

records of waste generation, storage, transportation, and disposal is essential for regulatory compliance and tracking progress towards waste reduction goals.

By recognizing the unique challenges of industrial waste and adopting appropriate management practices, the Project can minimize environmental and health risks, conserve valuable resources, and contribute to a more sustainable energy future.

4. Solid domestic waste

Solid domestic waste, generated from temporary worker camps during OHL construction or nearby communities experiencing increased activity, comprises a variety of materials with distinct environmental impacts.

Organic waste, including food scraps and kitchen waste, is often a significant component, especially in larger camps or if workers reside in the communities with inadequate waste management systems. While it can generate unpleasant odors and attract pests, it also holds potential as a resource for composting or biogas production.

Paper and cardboard waste (packaging materials, newspapers, magazines, and other paper products), varies in volume depending on consumption and recycling habits. When not recycled, it takes up valuable landfill space, but it can be transformed into new paper products, conserving resources and reducing energy consumption.

Plastics (bottles, containers, bags, and packaging films), can constitute a significant portion of solid domestic waste due to their widespread use. Plastics pose a threat to the environment as they persist in landfills for extended periods, leach harmful chemicals, and contribute to pollution, particularly in waterways and oceans where they harm marine life. While some plastics can be recycled, many types remain challenging or uneconomical to recycle.

Glass and metal waste (bottles, jars, cans and aluminum foil), also varies in volume depending on consumption and recycling practices. These materials occupy landfill space if not recycled, but they offer valuable resource potential, as both glass and metal can be recycled multiple times, conserving resources and energy.

Other waste, including textiles, rubber, leather, wood, and miscellaneous items, varies in volume depending on the project's nature and local waste disposal practices. Many of these materials decompose slowly in landfills, though some may be recyclable or reusable.

The solid domestic waste is characterized by its heterogeneity, encompassing a diverse range of materials with varying properties, making it challenging to manage and process. It also contains a significant portion of biodegradable organic waste and recyclable components like paper, cardboard, glass, and metal.

To mitigate its impacts, the Project should encourage waste reduction practices in worker camps and nearby communities, such as using reusable containers, minimizing packaging, and composting organic waste. Implementing effective recycling and composting programs is crucial to divert waste from landfills and recover valuable resources. Proper disposal of non-recyclable and non-compostable waste in designated landfills or waste-to-energy facilities is also essential. Furthermore, educating local communities about proper waste management practices and the environmental consequences of improper disposal can foster a more sustainable approach to waste management.

5. Wastewater

Wastewater encompasses primarily sewage and other liquid waste streams with potential environmental consequences.

Sewage, emanating from worker camps and sanitary facilities, contains organic matter, nutrients, pathogens, and sometimes chemicals from cleaning products. Its volume can be substantial in large projects with temporary worker housing. If untreated, sewage discharge can contaminate surface and groundwater, leading to eutrophication, oxygen depletion, and the spread of waterborne diseases. It can also seep into soil, affecting its quality and posing risks to plant and animal life.

Wastewater's composition and volume vary significantly depending on the project's size, location, and activities. Its liquid nature allows it to easily spread and contaminate large areas if not contained and managed properly. Most wastewater requires specialized treatment to remove contaminants before discharge or disposal.

Effective management involves robust containment and collection systems to prevent spills and leaks. Treatment methods such as biological treatment, filtration, or chemical processes are employed to remove contaminants before discharge or disposal. Treated wastewater must be disposed of in compliance with environmental regulations, and hazardous liquids require the involvement of licensed waste management companies. Additionally, comprehensive plans for spill prevention and response are crucial to address accidental releases of wastewater. By acknowledging the diverse nature of wastewater and adopting appropriate management strategies, OHL projects can minimize their environmental impact, protect water resources, and safeguard public health.

Summary of the waste related impacts is provided in the Table 9.26 below.

Table 9.26. Waste related impacts of the Project

Excavated soil, vegetation and debris	
Impact	Emergence of solid wastes as a result of soil excavation and land clearing activities
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are midterm as they are limited to the construction phase The impacts are local, but can become regional if the waste gets into water bodies Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high
Construction waste	
Impact	Emergence of wood, metal, concrete and plastic wastes formed by the leftovers of the construction materials
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are midterm as they are limited to the construction phase The impacts are local, but can become regional if the waste gets into water bodies Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high
Industrial waste	
Impact	Emergence of liquid and solid, hazardous and non-hazardous wastes during operation of vehicles and equipment

Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are long-term as they can occur throughout the project lifespan The impacts are local, but can become regional if the waste gets into water bodies Likelihood of the impacts is moderate, unless prevention measures are taken Impact magnitude is high
Impact importance	Importance of the impacts is high
Solid domestic waste	
Impact	Production of solid domestic waste in construction/operation facilities, camps and offices
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct The impacts are long-term as they can occur throughout the project lifespan The impacts are local, but can become regional if the waste gets into water bodies Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high
Wastewater	
Impact	Production of wastewater in construction/operation facilities, camps and offices
Receptor sensitivity	High – all receptor categories
Impact parameters	The impacts are direct

	The impacts are long-term as they can occur throughout the project lifespan The impacts are local, but can become regional if the waste gets into water bodies Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high

9.7.6. Proposed impact mitigation measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.27 is recommended.

9.7.7. Residual impacts

As a result of the above mitigation measures, the severity of the Project's identified waste related impacts is expected to be significantly lower.

Table 9.27. Measures to manage waste related impacts

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Excavated soil, vegetation and rock debris	High (construction phase)	Planning and design	**1.** Conducting a thorough assessment of the project area to identify soil types, vegetation cover, and geological formations. This information will guide excavation plans and waste management strategies. **2.** Development of a comprehensive waste management plan outlining procedures for handling, storage, transportation, and disposal of excavated materials. **3.** Ensuring that all activities comply with national waste management and environmental protection regulations	Low
		Excavation and handling	**1.** Minimizing the volume of excavated material by carefully planning excavation activities and avoiding unnecessary removal of soil and rock. **2.** Implementing erosion control measures, provided for in the Table 9.18 **3.** Separation of different types of excavated material (soil, vegetation, rock) to facilitate appropriate handling and disposal.	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Soil management	**1.** Implementation of topsoil management measures, proposed in the Table 9.18 **2.** Disposal of unsuitable or excess soil in designated landfills or approved disposal facilities, following regulatory guidelines **3.** If contaminated soil is encountered, implementation of appropriate remediation measures before reuse or disposal	
		Vegetation management	**1.** Minimizing vegetation removal by carefully planning the OHL routes and using directional felling techniques to avoid unnecessary damage to surrounding vegetation **2.** Chipping or mulching woody debris for use as ground cover, erosion control, or biomass fuel **3.** Composting suitable vegetation debris to create nutrient-rich soil amendments **4.** Disposal of unsuitable or excess vegetation debris in designated composting facilities or approved disposal sites **5.** Preventing the spread of invasive plant species through careful handling and disposal of vegetation debris	
		Rock debris management	**1.** Crushing and Screening of rock debris to produce usable materials like aggregate for construction purposes. **2.** Reusing larger rocks for erosion control, retaining walls, or landscaping features. **3.** Disposal of excess or unsuitable rock debris in designated landfills or approved disposal sites	

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
			Monitoring	Monitoring the effectiveness of waste management practices and adjust strategies as needed to ensure environmental protection	
Construction waste	High (construction phase)	Moderate (operation phase)	Waste prevention and reduction	**1.** Careful estimation of material quantities to avoid over-ordering and minimize surplus **2.** Using construction techniques and designs that minimize waste generation **3.** Prioritizing reusable formwork, scaffolding, and packaging materials to reduce waste **4.** Setting up separate bins and collection areas for different types of waste to facilitate recycling and reuse	Low
Construction waste	High (construction phase)	Moderate (operation phase)	Waste handling and storage	**1.** Provision of designated, secure areas for storing different waste streams to prevent mixing and contamination **2.** Labelling of waste containers to ensure correct sorting and segregation **3.** Implementation of spill prevention and containment measures for hazardous materials to protect the environment	Low
			Waste transportation	**1.** Planning of transportation routes to minimize travel distances and fuel consumption. **2.** Using licensed waste transporters with appropriate vehicles and permits for transporting hazardous waste. **3.** Tracking of waste transportation to ensure proper disposal and compliance with regulations	

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
			Waste treatment and disposal	**1.** Recycling of materials like metals, wood, concrete, and cardboard through partnerships with recycling facilities **2.** Reusing materials like wood and metal on-site or in other projects **3.** Disposal of non-recyclable waste in designated landfills, following proper procedures to minimize environmental impacts **4.** Engaging licensed hazardous waste disposal companies to handle and dispose of hazardous materials safely and in compliance with respective regulations	
			Operation sites	**1.** Regular maintenance of equipment and infrastructure to prevent breakdowns and reduce the need for replacements **2.** Repairing or refurbishing equipment instead of replacing it whenever possible. **3.** Storing spare parts and materials properly to prevent damage and waste **4.** Continuing recycling programs for materials like scrap metal during maintenance activities **5.** Proper handling, storage, and disposal of hazardous waste generated during maintenance.	
Industrial waste	High (construction phase)	Moderate (operation phase)	Waste minimization	**1.** Using materials and chemicals with lower environmental impact and toxicity **2.** Implementation of strict protocols for handling and storing hazardous materials to prevent spills and leaks. **3.** Streamlining construction processes to minimize waste generation and maximize efficiency.	Negligible

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
			Waste segregation and storage	**1.** Establishment of separate, clearly marked storage areas for different types of industrial waste, ensuring compatibility and preventing cross-contamination **2.** Using appropriate containers (e.g., drums, tanks) for storing hazardous waste, ensuring they are properly sealed and labeled. **3.** Having spill kits readily available to contain and clean up accidental spills of hazardous materials	
			Waste transportation and disposal	**1.** Engaging licensed hazardous waste transporters with specialized equipment and expertise for safe transportation **2.** Transporting hazardous waste to licensed treatment facilities for proper processing and disposal according to regulations. **3.** Maintaining detailed records of waste generation, transportation, and disposal to ensure compliance with environmental and safety regulations	
			Monitoring / inspections	**1.** Conducting regular inspections of equipment and infrastructure to identify potential leaks or spills of hazardous materials **2.** Routine maintenance to prevent equipment malfunctions that could lead to waste generation **3.** Maintaining secure storage areas for hazardous materials used in maintenance activities, ensuring proper labeling and containment	
			Waste minimization	**1.** Purchasing materials with minimal packaging and those that are recyclable or compostable. **2.** Encouraging the reuse of materials and equipment whenever possible.	Low

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
Solid domestic waste	High (construction phase)	Moderate (operation phase)		**3.** Implementation a comprehensive waste segregation system at worker camps and construction sites, providing separate bins for different waste streams (organic, recyclable, non-recyclable). **4.** Establishing on-site composting facilities to process organic waste, diverting it from landfills and producing nutrient-rich compost for landscaping or soil improvement **5.** Implementation of waste reduction practices at operational facilities, such as using refillable water bottles, minimizing paper usage, and promoting reusable containers **6.** Conduct regular awareness programs for workers and staff on proper waste segregation, recycling, and disposal practices **7.** Working with local communities to promote waste reduction and recycling initiatives	
			Collection and transportation	**1.** Regular Collection of waste from designated collection points. **2.** Using appropriate vehicles and containers for transporting waste to prevent littering and spills. **3.** Transporting waste to designated disposal or recycling facilities that comply with environmental regulations	
			Treatment and disposal	**1.** Maximizing recycling of materials like paper, cardboard, plastics, glass, and metal through partnerships with recycling centers. **2.** Disposal of non-recyclable waste in designated landfills, following proper procedures to minimize environmental impact.	

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
			Monitoring	Monitoring waste generation and disposal practices throughout the project lifecycle and report results to relevant stakeholders	
Waste water	High (construction phase)	Moderate (operation phase)	Planning and design	**1.** Development of a comprehensive wastewater management plan during the project's initial stages, outlining all aspects of wastewater generation, collection, treatment, and disposal. **2.** Training workers on proper wastewater handling and disposal procedures to minimize wastewater generation	Negligible
			Minimization, collection and containment	**1.** Exploring the use of new technologies, such as closed-loop systems for washing equipment, to minimize wastewater production **2.** Providing adequate portable toilets and handwashing stations for workers, strategically placed to minimize travel distances and potential contamination of water sources **3.** Collecting greywater (wastewater from sinks and showers) separately from blackwater (toilet waste) to enable simpler treatment options **4.** Implementation of spill prevention measures for fuel, chemicals, and other hazardous liquids, including secondary containment structures and absorbent materials.	

İmpact type	Magnitude		Mitigation measures		Post-action magnitude
			Environment	Description	
			Treatment and monitoring	**1.** Transportation of wastewater to the respective treatment facilities for proper handling **2.** Monitoring of a potential for groundwater contamination, implement a monitoring program to detect any changes in water quality and take corrective action if needed **3.** Monitoring of the quality of nearby streams, rivers, or other water bodies to assess the effectiveness of wastewater management practices	

9.8. Ecosystem Services

9.8.1. Scope of assessment

This section assesses potential impacts of the different phases of the Project on the important ecosystem services identified in the Project area, and suggests respective impact mitigation activities.

Geographical scope of the assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations, and the coverage areas of key affected ecosystem services. The assessment period covers both the construction and operation phases. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in "5.13 Ecosystem Services" section of the EBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.8.2. Sources and Sensitive Receptors

The negative impacts of the project on ecosystem services will occur during the implementation of the planned activities at all stages. Receptors who are sensitive to these impacts will be local users who stand to gain the services offered by the air quality, regulatory potential of soils, spiritual and religious value and partly fish resources, as well as local, regional, national and international users who benefit from the most of the other services identified.

9.8.3. Project Standards

The ESF WB ESS 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources is considered as a project standard for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA.

9.8.4. Assumptions and limitations

The assessment was implemented based on the following assumptions and limitations:

A. Assumptions

- Potential impacts on ecosystem services can be reasonably predicted. However, ecological systems are complex, and unforeseen interactions or long-term effects might not be fully captured

- It is assumed that proposed mitigation measures will be effective in reducing or offsetting negative impacts. However, their actual effectiveness might depend on implementation, monitoring, and adaptive management
- It is assumed that stakeholder perspectives on the value and importance of different ecosystem services are adequately represented. However, there might be power imbalances or limited participation that could affect the assessment.

Limitations:

- Assessment was made considering shortage of data on volumes and quality of the rendered services
- Ecosystem services are interconnected, and changes in one service can have cascading effects on others. These complex interactions might not be fully understood or accounted for in the assessment
- Limited data or scientific knowledge on certain ecosystem services can constrain the assessment's accuracy and comprehensiveness
- The assessment does not fully consider the broader socioeconomic context, such as the dependence of local communities on specific ecosystem services or the potential for distributional inequities in impacts and benefits
- The future is inherently uncertain, and factors like climate change or shifts in land use can alter the provision of ecosystem services and the project's impacts in unpredictable ways

9.8.5. Identified Impacts

The following ecosystem services can be potentially affected as a result of the Project activities:

- **Aesthetic value of the landscapes and landmarks** will be among the most altered ecosystem services identified in the Project area. Given that OHLs do not pose serious adverse threats and sometimes even enrich the aesthetic value of landforms, magnitude and importance of the impact can be characterized as moderate for historical monuments situated at some distance from the Project facilities, and low for natural landscapes and geosites
- **Biodiversity**: being one of the most affected environmental parameters of the Project area, sensitivity level of the biodiversity as an ecosystem service was assessed as high
- **Regulatory potential of soils and erosion control**. The magnitude and significance of the impact was assessed as low considering that the volumes of soils to be excavated or disturbed during the Project constitute small parts of the larger similar soil cover of the Project area
- **Grasslands**. The magnitude and significance of the impact was assessed as high for the users from the communities of Gobustan and Hajigabul districts which are predominantly dependent on animal pastoral farming and for the users from Aghsu and Shamakhi utilizing resources of the winter pastures of the Project AoI. The magnitude and significance of the impacts were assessed

as moderate for the users from the communities of the remaining Project AoI districts, such as Agdash, Yevlakh, Mingachevir, etc., which are dependent on animal husbandry and less dependent on natural grasslands.

- **Air quality**. Potential air quality impacts of the Project are expected to be short-term and limited to small parts of the Project area. Therefore, impact magnitude will be high but short lived, while the importance will be high locally and low within the geographic scope of the Project
- **Agricultural goods**. The magnitude and importance of the impacts were assessed as high at the level of the associated service, as the whole range of local, regional and national users of the goods produced in the project AoI will be affected.

The list and sensitivity levels of the impact receptors of the identified impacts is below:

Impacted ecosystem service	Sensitive receptors	Sensitivity level
1. Aesthetic value	Service users from Gobustan, Absheron, Shamakhi and Ismayilli districts, piedmont and mountainous communities of Hajigabul and Aghsu districts	moderate
2. Biodiversity	local, regional and national service users (fishermen, local communities, tourists, etc.. Contaminated effluents, if not properly controlled and treated, may pollute nearby water bodies, including irrigation canals, which contain commercial fish resources. As part of the project activities will be implemented in close proximity to the Shirvan National Park and the Turyanchay State Nature Reserve, and given that the photosque mountain landscapes of the zone are characterised by high quality recreational and tourism services, the number of tourists and researchers from nearby districts and abroad may decrease.	high
3.Regulatory potential of soils	service users from the communities utilizing and erosion control fertile land resources of the Project AoI Soil removal can have far-reaching and significant impacts on the environment and ecosystems, such as soil erosion, loss of fertility, disruption of soil structure, destruction of habitats, etc.	high

4. Grasslands	users from the communities of Gobustan and Hajigabul districts that are predominantly dependent on animal pastoral farming	high
	users from the other parts of Azerbaijan utilizing resources of the winter pastures of the Project AoI	high
	users from the communities of the remaining Project AoI districts, relying on livestock breeding with lower dependency on natural grasslands	moderate
5. Air quality	land users from all segments of the OHL corridors	high
	residents of the Project AoI settlements, whose houses and cultural facilities are situated close to the access roads	high
	visitors of the facilities (cemeteries, schools, medical points, etc.) situated close to the access roads and OHL corridors	moderate
6. Agricultural goods	the whole range of local, regional and national users of the goods produced in the Project AoI	high

Summary of the identified impacts is presented in the Table 9.28 below.

Table 9.28. Ecosystem services related impacts

Aesthetic value	
Impact	Changes in the aesthetic value of landscapes and natural/historical landmarks as a result of construction of new OHLs
Receptor sensitivity	- Low – landscapes and natural landmarks - Moderate – historical monuments
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are local in case of historical monuments and local geosites/rivers, and regional in case of extended landscapes (e.g. ridges, plains) - Likelihood of the impacts is high - Impact magnitude is moderate
Impact importance	**Importance of the impacts is moderate**
Biodiversity	

Impact	Impacts on biodiversity during construction and operation phases of the project
Receptor sensitivity	High – all users
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are regional - Likelihood of the impacts is high - Impact magnitude is high
Impact importance	**Importance of the impacts is high**
Regulatory potential of soil / erosion control	
Impact	Losses in the regulatory and erosion control potentials of soil as a result of land clearing and excavation
Receptor sensitivity	Low – all user categories
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are localized as negligible volumes of soils will be disturbed at the geographic scope of the Project - Likelihood of the impacts is high - Impact magnitude is low
Impact importance	**Importance of the impacts is low**
Grasslands	
Impact	Reduction in the area of grasslands available for pasturing
Receptor sensitivity	Low – all user categories
Impact parameters	- The impacts are direct - The impacts are short-term, as only some parts of the Project area will be inaccessible for shepherds during limited times within the construction period - The impacts are localized at the geographic scope of the Project - Likelihood of the impacts is low as the affected ecosystem service constitutes only small part of much larger service provision geography - Impact magnitude is negligible
Impact importance	**Importance of the impacts is negligible**
Air quality	

Impact	Aggravation in air quality related ecosystem service during the construction phase
Receptor sensitivity	**High – all user categories**
Impact parameters	- The impacts are direct - The impacts are short-term, as only some parts of the Project area will be inaccessible for shepherds during limited times within the construction period - The impacts are localized at the geographic scope of the Project - Likelihood of the impacts is high locally and low at the scale of the Project - Impact magnitude is high locally and low at the scale of the Project
Impact importance	**Importance of the impacts is high**
Agricultural goods	
Impact	Temporary reduction in the volumes of local agricultural production
Receptor sensitivity	- High – local farmers - Negligible – other user categories
Impact parameters	- The impacts are direct - The impacts are short-term, as the local farmlands lost for the needs of the Project will be compensated - The impacts are localized as negligible volumes of lands in remote parts of the Project area will be affected by resettlement program - Likelihood of the impacts is high - Impact magnitude is negligible
Impact importance	**Importance of the impacts is negligible**

9.8.6. Proposed impact mitigation measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.29 is recommended.

9.8.7. Residual impacts

As a result of the below mitigation measures, the severity of the Project's identified impacts on biodiversity is expected to be significantly lower.

Table 9.29. Measures to manage ecosystem services related impacts

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Aesthetic value	Moderate	Route selection and design	**1.** Conducting visual impact assessment to systematically assess the potential visual impacts of the project and identify mitigation measures **2.** In the areas with significant cultural or historical landscapes (Gobustan, Hajigabul, Shamakhi, Aghdash), considering the potential impact of OHLs on traditional viewsheds and sacred sites **3.** Designing structures (towers, conductors) to harmonize with the natural topography and vegetation. Using colours and materials that blend in rather than contrast **4.** Where feasible and cost-effective, considering undergrounding lines in particularly sensitive areas **5.** Involving local communities and stakeholders early in the planning process to understand their aesthetic concerns and incorporate their feedback into the project design	Negligible
		Construction sites	**1.** Carefully planning access roads and staging areas to minimize vegetation clearing and soil disturbance **2.** Implementation of comprehensive restoration plans to re-establish native vegetation and rehabilitate disturbed areas after construction	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Operation sites	**1.** Carefully managing vegetation under and around lines to maintain views and prevent tree-conductor conflicts, while promoting native plant growth **2.** Regular maintenance of structures to prevent rust, wear, and other signs of deterioration that could detract from the aesthetic value	
		Monitoring	**1.** Establishment of a monitoring program to track the effectiveness of mitigation measures and identify any unforeseen aesthetic impacts that may arise during operation	
Biodiversity	High		**1.** Implementation of mitigation measures, proposed in the Table 9.22 (biodiversity related impact mitigation)	
Regulatory potential of soil / erosion control	Low		**2.** Implementation of mitigation measures, proposed in the Table 9.18 (soil quality impact mitigation) and Table 9.19 (water quality impact mitigation)	Negligible

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Grasslands	Low/Moderate	Route selection and design	**1.** Designing the lines to cross grasslands at the narrowest possible point to reduce the division of habitat into smaller, less viable patches **2.** Designing the project to minimize impacts on flowering plants and consider planting pollinator-friendly species under lines	Negligible
		Construction sites	**1.** Scheduling construction activities outside of critical periods like nesting seasons for grassland birds or flowering periods for key plant species **2.** Implementation of strict soil erosion control measures during and after construction to protect the delicate topsoil layer essential for grassland health **3.** Using a carefully selected seed mix of native grassland species for restoration, ensuring it matches the local plant community	
		Operation sites	**1.** Focusing on controlling invasive plant species under and around lines, as these can quickly outcompete native grasses. **2.** As grazing is allowed under lines, working with local farmers or land managers to establish sustainable grazing practices that promote grassland health.	
Air quality	High		**1.** Implementation of mitigation measures, proposed in the Table 9.7 (air related impact mitigation) and Table 9.16 (noise and vibration related impact mitigation)	Low

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Agricultural goods	High (local farmers)	Construction sites	**1.** Scheduling construction activities outside of critical farming periods like planting, harvesting, or irrigation to avoid disrupting these operations **2.** Carefully stripping and storage of topsoil separately before construction to preserve its fertility; re-applying it after construction to aid in the rapid re-establishment of crops **3.** Ensuring that construction activities don't block access to fields or disrupt existing drainage patterns, as this can negatively impact crop yields **4.** Paying compensations to the local farmers who may lose products and incomes as a result of construction works	Low
		Operation sites	**1.** Electromagnetic Interference (EMI): OHLs can cause EMI, which may affect sensitive agricultural equipment like GPS systems or irrigation controls. Address this by implementing EMI shielding or grounding measures. **2.** Preventing herbicides used for vegetation management under lines from drifting onto crops, using targeted application methods or alternative vegetation management techniques. **3.** Establishing a fair compensation program for farmers in case of land acquisition and accidental crop damage caused by construction or maintenance activities.	Low

9.9. Landscape Visual Perception

9.9.1. Scope of assessment

OHL construction and operation projects can significantly impact landscape visual perception in various ways. This section assesses potential impacts of the different phases of the AZURE Project on main landscape types identified in the Project area, and suggests respective impact mitigation activities.

Geographical scope of the assessment encompassed the OHL corridors and access roads, as well as access roads and safety buffer zones of the substations, as well as the spreading areas of key landscape types of the Project area. As the construction phase is too short for landscape impacts to become valid, the assessment period covers the operation phase of the Project. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “5.12 Ecosystem Services” section of the EBS) as a result of such impacts, proposing activities to prevent or minimize impacts.

9.9.2. Sources and Sensitive Receptors

Main impact sources of the Project concerning visual perception of the Project area landscapes, are listed below:

- **Vertical Structures**: Towers and poles to be erected during the construction phase, will introduce tall, linear structures that disrupt natural skylines and viewsheds. Their size and prominence can be particularly jarring in open landscapes like valleys and plains.
- **Horizontal Lines**: Power lines themselves create a network of horizontal lines that can fragment views and contrast with the organic forms of the natural landscape.
- **Industrial Materials**: The use of metal, concrete, and other industrial materials can clash with the natural colours and textures of the environment.

The list of the sensitive users include local communities and visitors of the Project area. The sensitivity level varies from low in the Shirvan lowland, foothills of Ajinohur-Langabiz region and rarely visited parts of the Eastern Gobustan, to moderate around historical monuments, and high in the vicinities of protected nature areas and prominent mud volcanoes.

9.9.3. Project standards

The ESF WB ESS 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources is considered as a project standard on landscape biodiversity for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA.

9.9.4. Assumptions and Limitations

The assessment was implemented based on the following assumptions and limitations:

A. Assumptions

- Landscape perception is inherently subjective and can vary greatly depending on individual preferences, cultural values, and experiences
- Actual visual experience can be influenced by various factors, such as lighting conditions, weather, and seasonal changes, which are difficult to fully anticipate
- Assessment focused on static viewpoints and snapshot images of the landscape. However, visual perception is a dynamic process influenced by movement, perspective, and the overall context of the landscape
- Assessment focused primarily on the direct visual impact of OHL structures and lines, neglecting the broader effects on the overall landscape character, such as the disruption of natural patterns and the introduction of industrial elements.

B. Limitations:

- Landscape visual perception is inherently subjective and varies among individuals. This makes it challenging to establish a universally agreed-upon assessment of visual impact.
- The visual impact of OHLs is a complex phenomenon influenced by a multitude of factors, including the type and size of structures, their location and arrangement, the surrounding landscape, and the viewer's perspective. Capturing this complexity in an assessment is difficult.
- Assessment relies on limited data, such as photographs or simulations, which may not fully represent the dynamic and multi-sensory experience of the landscape.
- Assessment may not account for future changes in the landscape, such as vegetation growth, development activities, or changes in land use, which can alter the visual impact of OHLs over time.

9.9.5. Identified impacts

The following landscape perception related impacts were identified as a result of the assessment:

- **Fragmentation**: OHLs will visually divide landscapes, especially when they cross valleys or ridges. This can diminish the sense of openness and continuity.

- **Industrialization**: The presence of OHLs can introduce an industrial feel into otherwise natural or rural landscapes, impacting the perceived character of the area.
- **Light Pollution**: At night, aviation warning lights on tall towers can contribute to light pollution, affecting the visibility of stars and the nocturnal landscape.

Summary of the impact characteristics is provided in the Table 9.30 below.

Table 9.30. Landscape visual perception related impacts

Fragmentation of landscapes	
Impact	Visual division of the landscapes by vertical and linear structures of the Project OHLs
Receptor sensitivity	- Low – receptors from Shirvan lowland, Ajinohur-Langabiz area and Eastern Gobustan - Moderate – receptors visiting historical monuments - High – receptors visiting Turyanchay State Nature Reserve, Shirvan National Park and Gobustan volcanos
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are regional - Likelihood of the impacts is high - Impact magnitude is moderate
Impact importance	Importance of the impacts is moderate
Industrialization of landscapes	
Impact	Introduction of industrial feel into otherwise natural or rural landscapes
Receptor sensitivity	- Low – receptors from populated areas - Moderate – receptors visiting natural areas - High – receptors visiting Turyanchay State Nature Reserve and Shirvan National Park
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are regional - Likelihood of the impacts is high - Impact magnitude is moderate

Impact importance	Importance of the impacts is moderate
Light pollution	
Impact	Nighttime light pollution originating from aviation warning lights on tall towers (where adjacent to airports)
Receptor sensitivity	Low – all receptor categories
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are regional - Likelihood of the impacts is high - Impact magnitude is low
Impact importance	Importance of the impacts is low

9.9.6. Proposed impact mitigation measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.31 is recommended.

9.9.7. Residual impacts

As a result of the above mitigation measures, the severity of the Project's identified impacts is expected to be significantly lower.

Table 9.31. Measures to manage landscape related impacts

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Landscape fragmentation	Moderate	Design and construction	**1.** Minimizing the width of the right-of-way to reduce habitat disturbance and maintain connectivity **2.** Considering undergrounding OHLs in sensitive areas where the visual and ecological impacts of overhead structures are unacceptable **3.** Using directional drilling techniques to install underground cables with minimal surface disturbance in sensitive areas. **4.** Careful positioning individual towers and structures to avoid the closure of view of important landscape components.	Negligible
Industrialization	Moderate	Design and planning	**1.** Utilizing shorter towers or monopole structures where feasible to reduce their visual prominence **2.** Choosing muted colours for towers and conductors that blend with the surrounding environment, such as earth tones or shades of green. **3.** Using materials with non-reflective surfaces to reduce glare and visual impact. **4.** Involving local communities in the planning process to understand their concerns about visual impacts and incorporate their feedback into the project design.	Low

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Operation sites	**1.** Managing vegetation under and around the OHL to screen views of the structures and soften their visual impact. **2.** Regular maintenance of structures, including painting and cleaning, which can help them maintain a visually appealing appearance. **3.** Installation of interpretive signage along roads or trails near the OHL to educate the public about the project and its visual mitigation measures	
Light pollution	Low	Design	**1.** Utilizing the lowest intensity lighting necessary to meet safety requirements. **2.** Minimizing light pollution from aviation warning lights by using shielded fixtures, directional lighting, or dimming technologies. **3.** Using timers to turn off lights during periods of low activity	Negligible

9.10. Socio-Demographic Situation

9.10.1. Scope of assessment

OHL construction and operation projects can significantly impact socio-demographic situation in the Project area, imposing both adverse and positive types of the impacts. This section assesses potential impacts of the different phases of the AZURE Project on main socio-demographic parameters of the Project area communities, and suggests respective impact mitigation activities.

Geographical scope of the assessment encompassed the settlements located within the AoI of OHL corridors and access roads, as well as access roads and safety buffer zones of the substations. The assessment covered both construction and operation phases of the Project. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

Focus group discussions and consultation with project affected communities and field visits for identification of sensitive receptors

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “7.5 Local baseline” section of the SBS) as a result of such impacts, proposing activities to prevent or minimize the adverse impacts and maximize the positive impacts.

9.10.2. Sources and Sensitive Receptors

OHL construction and operation projects can create various sociodemographic impacts, especially during the construction phase. The list and short description of such impact sources expected from the AZURE Project is provided below:

- **Temporary influx of workers** - The arrival of construction workers, often from outside the local area, can temporarily increase the population, putting pressure on infrastructure, and services. The influx can also alter the social dynamics of a community, potentially leading to tensions or conflicts with local residents. Finally, the influx may increase demand for locally produced goods and services and, therefore, boost the local economy.
- **Land acquisition and displacement** - The acquisition of land for the OHL corridors can result in the displacement of residents and businesses, or, as in the case of the AZURE Project, acquisition of private arable land slots. In case, the entire or large parts of the land slots are acquired, this may cause economic losses and disruption of businesses led by the affected households. Finally, the land acquisition may lead to local community concerns about compensation and this makes

equitable and timely compensation of the affected households one of the first priority tasks of the project.

- Community safety and security:
  - Damage of village roads due to movement of machinery and heavy vehicles
  - Destruction of roads used by schoolchildren and adults.
  - Increased traffic due to project vehicles may cause safety issues for the community, especially for school children attending school during day-time; as well safety of the livestock taken to the pasture.
  - Restricted movement of villagers and vehicles through destroyed roads in winter.
  - The residents, especially children may not understand the risks and hazards which can cause traffic injuries
  - Disobedience of the local residents towards security personnel who may impose restrictions on people's daily activities

As seen from the Project description, AzerEnerji plans to accommodate the Project workforce in specially prepared modular construction camps situated in the territories of the company-run energy facilities in Mingachevir, Aghdash (Mirzahuseynli), Aghsu, Navahi, Alat, Sangachal, Gobustan and Gobu. Therefore, sensitive receptors to the Project's potential sociodemographic impacts will be mainly the residents of the below towns and villages.Provided that all cited settlements are relatively densely populated, sensitivity level of all receptors is characterized as moderate for the worker influx, and high for land acquisition and displacement.

9.10.3. Project standards

The WB ESF ESSs 2 are considered as a project standards for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA.

9.10.4. Assumptions and Limitations

The assessment was implemented based on the following assumptions and limitations:

A. Assumptions

- The assessment primarily relied on data collected from interviews with local municipalities and group consultations implemented with the affected community representatives as well as focus group discussions with stakeholders. The representativeness of this data can be a significant assumption, as the views and experiences of the selected participants may not fully reflect the broader community
- It is assumed that there is a linear relationship between the scale of the project and its sociodemographic impacts. However, impacts can be complex and non-linear

- It is assumed that there is a certain level of stability in social systems, such as community cohesion, social networks, and cultural practices. However, these systems can be dynamic and may change over time, potentially affecting the accuracy of impact predictions
- It is assumed that proposed mitigation measures will be effectively implemented and will successfully address the identified impacts. However, the actual effectiveness of these measures can be difficult to predict and may vary depending on implementation and local conditions.
- It is assumed that the affected people may demonstrate mistrust towards project activities and potential benefits due to poor experience from previous projects implemented in the community (eg compensation, reinstatement, safety, local hiring issues). In consideration of such an issue, the project has to reinforce stakeholder engagement, build strong linkages and trust with the communities, and closely monitor Contractor's compliance with the rules and procedures.

B. Limitations:

- The assessment focused on quantifiable impacts (e.g. changes in population, displacement), which can lead to an underestimation of qualitative impacts, such as cultural disruption, loss of community identity, or changes in social well-being, which are harder to measure but equally important
- The assessment focused on the short-term impacts of construction and the early operation phase, and may not adequately capture long-term or indirect impacts that may emerge over time, such as changes in land use patterns, social dynamics, or community resilience
- The availability and quality of sociodemographic data can vary significantly, especially in smaller villages of the Project area, which can limit the accuracy and comprehensiveness of the assessment
- The identified impacts can be perceived and experienced differently by different individuals and groups within a community. This subjectivity can make it challenging to reach consensus on the significance and severity of certain impacts.

9.10.5. Identified impacts

1. Temporary population increase

OHL construction projects often cause temporary population increases, significantly impacting local communities. The influx of workers, from skilled labourers to engineers and project managers, strains local resources and alters social dynamics. This surge is further amplified by the additional personnel required for support services like catering, security, and transportation.

At the scale of the AZURE Project, the impact magnitude will be low, as only limited number of people will be visiting and staying in the smaller settlements for quite a short period of time, whereas magnitude of the impact will be low (in the towns) to moderate (in smaller settlements) in the areas where the construction camps will be erected.

2. Inflation of prices for local goods and services

While the influx of workers can stimulate the local economy through increased spending, it can also lead to price inflation and competition for resources.

Provided that local markets of the affected communities will hardly experience prevalence of demand over the Project-borne offer, the impact magnitude is expected to be low at the scale of the AZURE Project, and limited to the opportunistic pricing by some local farmers and traders.

3. Altered social dynamics

The sudden arrival of a large number of temporary workers can also alter the social dynamics of the community, leading to increased traffic, noise, and potential conflicts with locals.

At the scale of the AZURE Project, the impact magnitude will depend on size of the affected community and the development of available infrastructure. For example, the magnitude is expected to be low in the noisier and more crowded towns with developed road infrastructure, moderate in larger settlements and high in smaller village communities situated relatively far from the main infrastructure facilities of the districts.

4. Impacts associated with land acquisition and land use restrictions

Community assumptions on project impacts:

Private land parcel is a significant income source for majority of the people, especially those with a scarce land portion (eg. in Aghsu, Gegeli village, each HH owns 30 acres of land) who would prefer land plot exchange. The RAP shall deliberately consider such cases to mitigate the impact.

The potential impacts on livelihood associated with the land acquisition during the construction period include:

- Temporary loss of crops causing reduction of income source
- Temporary loss of employment opportunities for whom the land is the main income source
- Temporary impact on the land under the OHLs, due to restriction of agricultural activities,

Community assumptions on potential impact to agricultural fields and pastures.

The potential impacts on movement and operation of the machinery in the grazing areas/pastures and dry-irrigated land include:

- Temporary limited access to grazing area/pastures
- Destroying and trampling the grazing areas/pastures.
- Reduced grazing area/pastures.
- Waste generation in the grazing areas/pastures.

- Restricted movement of agricultural machinery and equipment due to OHL's low height
- Damage to the top layer of the soil. Failure to proper levelling and reinstatement of the land plot upon completion of works, affects the soil layer and visual appearance.
- Community preference to construct lines away from community areas/land parcels to avoid any impact on community activities (eg. villages in Agdash region):

The pole locations along the OHLs will permanently occupy 301.745 sq.m of land currently used by 609 households for various activities. The lands affected by transmission lines and access roads will only be temporarily occupied during construction. Easement rights will be established for transmission lines in which Azerenerji has a right to use land during construction while the ownership rights will remain registered in the name of landowner(s) and where relevant will be assessed for compensation due to loss of rights. The ESIA/ESMP will be updated in the event of further updates to the number of affected households and the area proposed for easement.

Although the linear nature of these project components is not expected to create significant impacts on affected parcels, several impacts borne from land acquisition requirements such as; temporary loss of lands for agricultural cultivation, loss of standing crops and trees due to construction activities, temporary disruption to grazing activities and/or reduced access to agricultural land and pastures, etc. No physical displacement of people (relocation or loss of shelter) is expected. As mentioned above ESIA/ESMP will be updated in the event of further updates to the number of affected households and the area proposed for easement.

All land acquisition, either permanent or temporary will be done in compliance with the relevant Azerbaijan legislation and international requirements (WB ESS 5). If land acquisition causes economic displacement of people, appropriate measures to assist with restoration of livelihoods and standards of living will be included in the Resettlement Action Plan, which is to be prepared once the detailed Project design is verified and detailed data on affected land property and its value is available. There will be no land acquisition until full payment of compensation due has been paid.

According to the relevant Azerbaijani regulation, the minimum vertical clearance for 330 kV transmission line above the ground in areas accessible for people, including arable agricultural land, is 20 meters. This minimum vertical clearance is generally at the middle of a span between two towers. Therefore, all agricultural activities within the RoW which include cultivated plants (e.g. crops, vineyards, orchards, other valuable trees, etc.) which do not reach a height of 10 meters would not be necessary removed and can be further utilized as before construction of a transmission line. After the completion of the construction activities (including the full reinstatement of the land surface) the areas for which easement rights have been established are handed back to the initial owners. However, landowners and users will not be able to use land along the OHL routes during the period of construction.

For the purposes of the current ESIA, a 100 metres wide corridor was used for consideration of the direct effects and changes on the current key land use forms (e.g. agricultural land, woodland, urban land, etc.). This zone is based on the land anticipated to be directly affected by the Project, i.e. potentially required temporarily and/or permanently for the construction, operation and maintenance of the transmission

lines and where specific land use rules would be established to ensure technical safety of the OHL and protection of people and environment during its operation.

The impact magnitude was assessed as high for the local communities which will be affected by land acquisition program of the Project.

Summary of the impact characteristics is provided in the Table 9.32 below.

Table 9.32. Sociodemographic and land acquisition impacts

Temporary population increase	
Impact	Temporary increase of population in the affected communities due to influx of outside workers
Receptor sensitivity	- Low – communities of Mingachevir, Aghdash, Aghsu and Goychay - High - communities of urban-type settlements and villages
Impact parameters	- The impacts are direct - The impacts are midterm and expected only during the construction phase - The impacts are local for being limited to separate local communities - Likelihood of the impacts is high - Impact magnitude is moderate
Impact importance	Importance of the impacts is moderate

Inflation	
Impact	Inflation of prices for local goods and services
Receptor sensitivity	Low – all communities
Impact parameters	- The impacts are direct - The impacts are midterm for being expected only during the construction phase - The impacts are local for being limited to separate local communities - Likelihood of the impacts is low - Impact magnitude is high, if the impact occurs
Impact importance	Importance of the impacts is low
Social dynamics	
Impact	Altering of the social dynamics, leading to increased traffic, noise, and potential conflicts with locals.

Receptor sensitivity	- Low – communities of Mingachevir and Goychay - Moderate – communities of urban-type settlements - High – smaller village communities
Impact parameters	- The impacts are direct - The impacts are midterm for being expected only during the construction phase - The impacts are local and limited to separate communities - Likelihood of the impacts is moderate - Impact magnitude is high
Impact importance	Importance of the impacts is high
Land acquisition and restrictions to land use	
Impact	Concerns and losses associated with acquisition of privately owned land spots and restriction of rights
Receptor sensitivity	High
Impact parameters	- The impacts are direct - The impacts are long-term and are in effect throughout the project lifespan - The impacts are local for being limited to separate communities - Likelihood of the impacts is high - Impact magnitude is high
Impact importance	Importance of the impacts is high
Impact	Temporary loss of lands for agricultural cultivation
Receptor sensitivity	Moderate
Impact parameters	- The impacts are direct - The impacts are temporary, during construction activities - The impacts are local for being limited to separate communities - Likelihood of the impacts is moderate - Impact magnitude is law
Impact importance	Importance of the impacts is high
Impact	loss of standing crops and trees due to construction activities
Receptor sensitivity	High
Impact parameters	- The impacts are direct - The impacts are temporarily during construction activities

	- Likelihood of the impacts is moderate - Impact magnitude is law
Impact importance	Importance of the impacts is high
Impact	temporary disruption to grazing activities and/or reduced access to agricultural land and pastures
Receptor sensitivity	High
Impact parameters	- The impacts are direct - The impacts are temporarily during construction activities - Likelihood of the impacts is moderate - Impact magnitude is law
Impact importabce	Importance of the impacts is high

9.10.6. Proposed impact mitigation measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.33 is recommended.

9.10.7. Residual impacts

As a result of the above mitigation measures, the severity of the Project's identified impacts is expected to be lower.

Table 9.33. Measures to manage sociodemographic impacts

Impact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Temporary population increase	Moderate	Planning	**1.** Conducting a thorough assessment of the potential accommodation demand, considering the project's size, duration, and workforce demographics **2.** Establishment of a proactive and ongoing communication channel with local communities to address concerns, provide project updates, and solicit feedback	Low
		Construction sites	**1.** Ensuring that temporary construction camps have adequate facilities (accommodation, catering, sanitation) to house workers on-site. **2.** Where possible, hiring local workers who already have housing in the area to reduce the demand for accommodation	
Inflation of prices for local goods and services	Low	Planning	**1.** Conducting a thorough assessment of the local market before the project begins to understand the supply and demand dynamics for various goods and services. This can help anticipate potential areas of price pressure and inform mitigation strategies. **2.** Establishing a price monitoring system to track changes in the prices of essential goods and services throughout the project's duration. This can help identify early signs of inflation and trigger appropriate interventions.	Low

Impact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Supply / demand	**1.** Collaborating with local businesses to increase the supply of goods and services to meet the increased demand. This could involve supporting local producers, facilitating the expansion of existing businesses, or attracting new businesses to the area **2.** Provision of subsidies or incentives to businesses to encourage them to maintain affordable prices for essential goods and services **3.** Educating workers about the potential impact of their spending on local prices and encouraging them to support local businesses and avoid excessive consumption **4.** Seeking alternative options for workers to access goods and services, such as on-site catering or transportation services, to reduce pressure on local businesses **5.** In extreme cases of price gouging, implementation of temporary price controls on essential goods and services to protect consumers **6.** Enforcement of existing anti-gouging laws to deter businesses from taking advantage of the situation and unfairly raising prices.	

Impact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Altered social dynamics	High	Construction and operation sites	**1.** Involving local communities in the planning and decision-making processes from the early stages of the project. This can help to build trust, address concerns, and ensure that project benefits are shared equitably. **2.** Provision of cultural sensitivity training to workers to promote understanding and respect for local customs and traditions. **3.** Investing in community projects and initiatives that address local needs and priorities, such as education, healthcare, handicrafts or infrastructure development. **4.** Prioritization of hiring local workers and sourcing goods and services from local businesses to ensure that the economic benefits of the project are shared with the community. **5.** Establishment of effective grievance mechanisms to address complaints and resolve conflicts between the project and local communities.	Low

Impact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Land acquisition	High	Project design	**1.** Development and implementation of resettlement plan **2.** Exploring alternative OHL routes that minimize land acquisition, especially in areas with high population density, valuable agricultural land, or cultural significance **3.** Optimization of the OHL corridor design to minimize land take **4.** Conducting cultural heritage assessments to identify and protect sites of cultural or historical significance **5.** Establishment of effective grievance mechanisms to address complaints and resolve conflicts between the project and local communities	Low
		Construction	**1.** Development of ESMP; maximum avoidance of temporarily access to private land during construction works; approval from the village authorities approval for access roads to the OHL construction sites; **2.** Contractors to negotiate with landowners on the temporary land use; **3.** Implementation of RAP; negotiation of construction schedule with local authorities to avoid an impact on standing crops; payment of compensation for crops and trees lost as a result of construction works; **4.** Consultation with local communities and local authorities on temporarily alternative grazing land for PAPs; contractors to negotiate with PAPs on their acceptable conditions for temporary disruption to their grazing activities and / or reduced access to agricultural land.	

Impact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Compensations	1. Ensuring that land acquisition processes are transparent, fair, and involve meaningful consultation with affected landowners and communities 2. Provision of prompt and fair compensation for acquired land based on its market value and potential loss of income 3. Offering property value guarantees or compensation to residents whose property values may be negatively affected by the project	
Restriction of access	High	Construction phase	1. Scheduling construction activities to minimize disruption to local access and movement patterns. 2. Provision of temporary access routes or crossings during construction to maintain connectivity for communities 3. Negotiating agreements with landowners to allow continued access to their properties under certain conditions 4. Creation of designated public access points along OHL corridors for recreational activities, respecting safety considerations 5. Development of alternative routes for local communities or livestock to bypass the OHL and access essential resources Implementation of the grievance mechanism	Low

9.11. Economic Welfare, Employment Opportunities

9.11.1. Scope of assessment

This section assesses potential impacts of the different phases of the AZURE Project on the economic welfare and employment rates of the Project area communities, and suggests respective impact mitigation activities.

Geographical scope of the assessment encompassed the settlements located within the AoI of OHL corridors and access roads, as well as access roads and safety buffer zones of the substations. The assessment covered both construction and operation phases of the Project. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in "6.5 Project area baseline" section of the SBS) as a result of such impacts, proposing activities to prevent or minimize the adverse impacts and maximize the positive impacts.

9.11.2. Sources and sensitive receptors

OHL construction and operation projects can create various welfare and employment related impacts, expected throughout the project lifecycle.

The project, mainly its' construction phase, may trigger economic activity in the project affected communities, and, resultantly lead to the improvement of welfare of the economically active local households and businesses.

On the other hand, the Project may lead to an emergence of additional employment opportunities for the locals, both through the potential of being hired by the Project and opening new trade/service facilities.

Finally, there is an example of adverse welfare-related impact of the project, which consists in temporary limitation and restriction of access to the construction sites of the project. Construction activities and increased traffic can disrupt local businesses, particularly those located near the construction site or along access roads.

Sensitive receptors to the Project's potential welfare and employment related impacts include all receptors from the affected local communities, businesses and farmers.

9.11.3. Project standards

The WB ESF ESSs are considered as a project standards for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA.

9.11.4. Assumptions and Limitations

The assessment was implemented based on the following assumptions and limitations similar to those sited in Paragraph 10.2.4.

9.11.5. Identified impacts

1. Economic activity

Triggering of economic activity may be one of the most important positive impacts of the Project. With due consideration of possible negative implications described in the previous paragraph, construction phase of the project will benefit the local economies to the different extents, varying from low and moderate in the towns to high in the urban-type settlements and small village communities.

2. Employment opportunities

Creation of new job opportunities will highly benefit the employment environment of all local communities. Although the impact will be of the highest magnitude during the construction phase, there still will be opportunities for locals to find jobs in the OHL and station operation / maintenance works.

3. Wage disparities

Being positive in general, emergence of new employment opportunities may be accompanied with negative sub-impact associated with possible disparities in wages between local and external employees from one side, and local people unemployed by the Project from the other.

4. Restrictions

Limitation and restriction of access to the construction sites will be temporary and fragmental with phase-by-phase nature of the construction works taken into consideration. On the other hand, permanent restricted access to the safety zones of OHL towers and stations will be the case within the small land slots, not imposing serious impacts neither on local residents nor on the farmers and external visitors.

Summary of the impact characteristics is provided in the Table 9.34 below.

Table 9.34. Economic welfare and employment related impacts of the Project

Economic activity	
Impact	Triggering of local economic activity during construction phase of the project
Receptor sensitivity	Low – communities of Mingachevir and Goychay High - communities of urban-type settlements and villages
Impact parameters	The impacts are direct The impacts are moderate during the construction phase The impacts are local for being limited to separate local communities Likelihood of the impacts is high in smaller settlements Impact magnitude is high
Impact importance	Importance of the impacts is high (positive)
Employment opportunities	
Impact	Creation of new jobs for local residents
Receptor sensitivity	Moderate – communities of Mingachevir and Goychay High - communities of urban-type settlements and villages
Impact parameters	The impacts are direct The impacts are long-term The impacts are local for being limited to separate local communities Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high (positive)
Wage disparities	
Impact	Difference between wages of the Project employees and local residents (hired and non-hired by the Project)
Receptor sensitivity	High – all communities

Impact parameters	The impacts are direct The impacts are midterm during the construction, and long-term during the operation phase The impacts are local for being limited to separate local communities Likelihood of the impacts is high Impact magnitude is moderate
Impact importance	Importance of the impacts is high
Restrictions	
Impact	Limitation and restriction of access to construction sites and project facilities
Receptor sensitivity	Low – all communities
Impact parameters	The impacts are direct The impacts are midterm during the construction, and long-term during the operation phase The impacts are local for being limited to separate local communities Likelihood of the impacts is high Impact magnitude is low
Impact importance	Importance of the impacts is low

9.11.6. Proposed impact mitigation measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.35 is recommended.

9.11.7. Residual impacts

As a result of the above mitigation measures, the severity of the Project's identified impacts is expected to be significantly lower.

Table 9.35. Measures to manage economic welfare and employment related impacts

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Econo mic activity	High positive	Construction phase	**1.** Fostering partnerships with local businesses for construction needs **2.** Sourcing goods and services from local businesses to ensure that the economic benefits of the project are shared with the community	Low
		Operation phase	**1.** Establishment of community benefit funds to support local projects and initiatives that contribute to long-term economic growth and resilience **2.** Investing in community projects and initiatives that address local needs and priorities, such as education, healthcare, handicrafts or infrastructure development **3.** Continuing to foster partnerships with local businesses for ongoing maintenance and operational needs **4.** Providing support to local businesses to help them adapt to the changing economic landscape, such as through business training, marketing assistance, or access to finance **5.** Maintaining open communication channels with the community to address any ongoing economic concerns and ensure that the project's benefits are shared equitably	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Employment opportunities / wage disparities	High	Construction and operation phases	**1.** Implementation of the Project's Labour Management Plan **2.** Ensuring that all contractors develop and implement their LMPs in line with general LM **3.** Active recruiting and hiring local workers for construction jobs, providing them with training and skill development opportunities **4.** Reaching out to underrepresented groups within the community to ensure equal access to employment opportunities **5.** Establishment of a fair and transparent wage structure that ensures equal pay for equal work, regardless of worker gender **6.** During hiring, ensuring the transparency regarding wage structures and compensation packages, to make it easy for local workers to negotiate fair wages **7.** Encouraging collective bargaining agreements between workers and employers to negotiate fair wages and working conditions **8.** Avoiding discrimination based on gender, ethnicity, or social status to prevent some local residents from accessing employment opportunities **9.** Conducting outreach programs to inform local communities about job opportunities and recruitment processes **10.** Organization of training programs to local residents to enhance their skills and employability in the energy sector, increasing their chances of securing long-term employment opportunities **11.** Maintaining open and transparent communication with local communities and workers regarding employment and wage policies **12.** Issuance of regular reports on the project's employment and wage data, including the number of local and non-local workers hired and their average wages	Low

9.12. Infrastructure and Transport

9.12.1. Scope of assessment

This section assesses potential impacts of the different phases of the AZURE Project on the infrastructure and traffic intensity of the Project area communities and wider areas, and suggests respective impact mitigation activities.

Geographical scope of the assessment encompassed the settlements located within the AoI of OHL corridors and access roads, access roads and safety buffer zones of the substations, as well as interference of the Project facilities and their access roads with main roads identified in the Project area. The assessment covered both construction and operation phases of the Project. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “6.5 Project area baseline” section of the SBS) as a result of such impacts, proposing activities to prevent or minimize the adverse impacts and maximize the positive impacts.

9.12.2. Sources and sensitive receptors

Considering that the project facilities are located in areas with well-developed infrastructure, the only source of the potential adverse impacts of the project are construction and maintenance works which will potentially impact the local infrastructure and transport network is freight and passenger traffic along the Project affected roads. In terms of positive impacts, the most important impact would be the improvement of the national / regional power system, which will affect not only the Project AoI, but different regions of Azerbaijan and the country as a whole.

Sensitive receptors were identified as follows:

- Community residents characterized by high sensitivity against the potential impacts upon access roads of the project.
- Local and external users of main inter-district and national highways characterized by low sensitivity due to latter’s traffic capacity.

9.12.3. Project standards

The WB ESF ESSs are considered as a project standard for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA. .

9.12.4. Assumptions and limitations

No assumptions or limitations were identified during the infrastructure and transport network impact assessments.

9.12.5. Identified impacts

1. Increased traffic intensity, road closures and detours

- During construction, the transportation of heavy equipment and materials, along with the daily commute of workers, can lead to increased traffic, congestion, delays, and potential safety hazards on local roads. Additionally, heavy trucks and machinery can damage roads and infrastructure, necessitating repairs and maintenance.
- Construction activities may also require temporary road closures or detours, further disrupting traffic flow and inconveniencing local residents and businesses. However, it's crucial to ensure emergency services can still access affected areas during these closures.

2. Noise and vibration

Noise and vibration are other significant concerns. The operation of heavy machinery, pile driving, and other construction activities can generate substantial noise pollution, impacting the quality of life for nearby residents. Furthermore, ground vibrations from construction can potentially damage nearby buildings or infrastructure.

3. Visual impacts

During operation, the visual impact of OHL towers and lines on roads, bridges, and other transportation infrastructure can be a concern, especially in scenic areas. This visual clutter may also distract drivers and increase accident risks.

4. Electromagnetic interference

Another potential issue is electromagnetic interference (EMI) from OHLs, which can sometimes interfere with traffic signals, railroad crossings, or other electronic control systems. Implementing EMI shielding or grounding measures can mitigate this risk.

5. improvement of the national / regional power system

The project will bring significant benefits to national and regional power systems. It will considerably increase transmission capacity, allowing more power to be transported over longer distances. This will enable the integration of new alternative power generation sources in remote areas. New OHLs to be constructed as part of the Project will also enhance grid reliability by providing redundancy and alternative transmission paths, reducing the risk of blackouts. Additionally, the Project will improve power quality by stabilizing voltage and ensuring a consistent electricity supply, which is crucial for industries.

Finally, OHLs can facilitate cross-border electricity trade, promoting energy security and economic benefits for involved regions.

Summary of the impact characteristics is provided in the Table 9.36 below.

Table 9.36. Infrastructure and transport related impacts of the Project

Traffic intensity	
Impact	Increased traffic intensity, road closures and detours during the construction phase
Receptor sensitivity	Negligible – highways High – district and village level roads
Impact parameters	The impacts are direct The impacts are midterm for being expected only during the construction phase The impacts are local for being limited to road users from several communities Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high
Noise and vibration	
Impact	Inconvenience of the residents of near-road houses as a result of noise and vibration on the access roads
Receptor sensitivity	Negligible – highways High – district and village level roads
Impact parameters	The impacts are direct

	The impacts are midterm for being expected only during the construction phase The impacts are local for being limited to road users from several communities Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high
Visual impacts	
Impact	Concerns about visual impact of OHL towers and lines on roads, bridges, and other transportation infrastructure
Receptor sensitivity	Low – all communities
Impact parameters	The impacts are direct The impacts are midterm during the construction, and long-term during the operation phase The impacts are local Likelihood of the impacts is high Impact magnitude is low
Impact importance	Importance of the impacts is low
Electromagnetic interference	
Impact	Electromagnetic interference from OHLs, which can sometimes interfere with traffic signals, railroad crossings, or other electronic control systems
Receptor sensitivity	High
Impact parameters	The impacts are direct The impacts are long-term The impacts are local for being limited to road users from several communities Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high

improvement of the national / regional power system	
Impact	Better energy provision of Azerbaijan and regions as a result of new energy transmission infrastructure
Receptor sensitivity	High
Impact parameters	The impacts are direct The impacts are long-term The impacts are national and regional Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high positive

9.12.6. Proposed impact management measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.37 is recommended.

9.12.7. Residual impacts

As a result of the above mitigation measures, the severity of the Project's identified impacts is expected to be significantly lower.

Table 9.37. Measures to manage infrastructure and transport related impacts

İmpact type	Magnitude		Mitigation measures		Post-action magnitude	
			Environment	Description		
Traffic intensity	High (construction phase)	Negligible(operation phase)	Planning	**1.** Conducting a thorough assessment of existing traffic patterns, road conditions, and potential congestion points before construction begins **2.** Development of the Traffic Management Plan and its' communication to local communities, businesses, and emergency services to minimize disruption and ensure access to essential services **3.** Identifying designated routes for construction vehicles and materials transport, avoiding residential areas and sensitive locations whenever possible **4.** Implementation of traffic control measures like temporary traffic signals, signage, flagmen, and speed reductions to ensure smooth traffic flow and prioritize safety **5.** Development and implementation of an emergency response plan to address accidents or incidents that may occur along the OHL route, minimizing disruptions to traffic flow **6.** Launch public awareness campaigns to inform local residents about construction schedules, traffic detours, and safety precautions **7.** Provision of real-time traffic updates through online platforms, mobile apps, or variable message signs to help drivers plan their routes and avoid delays	Low (construction phase)	Negligible (operation phase)

İmpact type	Magnitude		Mitigation measures		Post-action magnitude	
			Environment	Description		
			Scheduling / timing / alternative transportation	**1.** Scheduling deliveries and heavy equipment transport during off-peak hours to minimize traffic congestion **2.** Dividing the project into phases and scheduling activities strategically to reduce the number of simultaneous work zones and their impact on traffic flow **3.** Providing shuttle services for workers to reduce the number of individual vehicles on the road **4.** Collaboration with local transit authorities to enhance public transportation options to and from the construction site **5.** Working closely with local authorities, traffic police, and community groups to coordinate traffic management efforts and address any concerns that arise.		
			Road maintenance and repair	**1.** Regular inspections of roads used by construction vehicles to identify and repair any damage promptly **2.** Implement dust suppression measures, such as watering or using dust suppressants, to minimize the impact on air quality and visibility **3.** Maintaining vegetation along the roads and OHL corridors to ensure clear sightlines for drivers and prevent obstructions		

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Noise and vibration	High (construction phase)	Construction and operation phases	**1.** Implementation of mitigation measures, proposed in the Table 9.16	Low
Visual impacts	Low	Operation phase	**1.** Designing OHL structures with consideration for visual impact on transportation infrastructure, using colours and materials that blend with the surroundings	Negligible
EMI	High	Operation phase	**1.** Implement EMI shielding or grounding measures to prevent interference with sensitive electronic systems	Negligible
Improvement of the national / regional power system	High positive	Operation phase	**1.** Due implementation of all adverse impact management measures to maximize its' positive effect	

9.13. Health and Safety

9.13.1. Scope of assessment

This section assesses potential impacts of the different phases of the AZURE Project on the health and safety of the Project area communities and the Project staff, and suggests respective impact mitigation activities.

Geographical scope of the assessment encompassed OHL corridors, substation areas and safety zones, as well as the settlements located within the AoI and access roads of the Project. The assessment covered both construction and operation phases of the Project. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in “6.5 Project area baseline” section of the SBS) as a result of such impacts, proposing activities to prevent or minimize the adverse impacts and maximize the positive impacts.

9.13.2. Impact Sources and Sensitive Receptors

The sources of potential impacts associated with the project implementation include all the measures to be taken under the project. Impacts emerging from these activities cover the wide range of physical, chemical, psychosocial, electrical, environmental, as well as community health and safety hazards.

Sensitive receptors are the employees engaged in the construction and operation phases of the Project, as well as the residents of AoI settlements and other receptor categories.

9.13.3. Project standards

The WB ESF ESSs are considered as a project standards for this project, including those considered by national legislation acts and international agreements, as described in Chapter 3 of the ESIA. .

9.13.4. Assumptions and limitations

The assessment was implemented based on the following assumptions and limitations:

A. Assumptions

- The assessment relies on the accuracy and completeness of available data on potential hazards, exposure levels, and health effects. However, data may be limited or outdated, especially for emerging risks or for specific populations
- It is assumed that that workers will follow safety protocols and guidelines consistently. However, human error, fatigue, and other factors can influence actual behavior and increase risks
- It is assumed that proposed mitigation measures will be effectively implemented and maintained. However, their effectiveness can be affected by various factors, such as cost constraints, regulatory changes, or lack of enforcement
- The assessment focused on the direct and immediate health and safety risks associated with a project, and did not fully consider indirect or cumulative impacts, such as those related to community health, social well-being, or long-term environmental effects.

B. Limitations:

- The assessment involves inherent uncertainty due to the complexity of health and safety risks, the variability of individual responses, and the limitations of predictive models. This uncertainty can make it difficult to quantify risks accurately and to prioritize mitigation measures
- The assessment focused on quantifiable risks that can be measured and modeled, such as injury rates or exposure levels. However, it may not adequately address subjective or qualitative factors, such as worker stress, community concerns, or the impact on mental health
- The assessment may not always involve meaningful engagement with all relevant stakeholders, such as workers, local communities, or vulnerable populations. This can limit the scope of the assessment and overlook important perspectives and concerns
- The assessment focused on the pre-construction and construction phases, with limited follow-up during the operation phase. This lack of long-term monitoring can make it difficult to evaluate the actual health and safety impacts of a project over time

9.13.5. Identified impacts

The main impact types related to the health and safety of the construction and operation phases of the AZURE Project are listed below:

A. Construction Phase:

1. Physical Hazards:

- Working at Height: Falls from towers, poles, or scaffolding.
- Electrical Hazards: Contact with energized lines or equipment, electric shock, and arc flash.
- Heavy Machinery: Accidents involving cranes, trucks, excavators, and other machinery.
- Falling Objects: Materials or tools dropped from height.
- Trenching and Excavation: Cave-ins, collapses, or asphyxiation in confined spaces.
- Manual Handling: Strains, sprains, and other musculoskeletal injuries from lifting, carrying, or moving heavy objects.
- Noise and Vibration: Exposure to excessive noise and vibration can cause hearing loss, stress, and other health issues.
- Dust and Fumes: Inhalation of dust, fumes, or other airborne contaminants can lead to respiratory problems.
- Extreme Weather: Heatstroke, hypothermia, or other weather-related illnesses.

2. Chemical Hazards:

- Hazardous Materials: Exposure to paints, solvents, cleaning agents, fuels, and other chemicals used in construction and maintenance.
- Asbestos: Potential exposure to asbestos in older OHL structures, which can cause lung cancer and mesothelioma.

3. Biological Hazards:

- Zoonotic Diseases: Contact with wild animals or their droppings can expose workers to zoonotic diseases like rabies or hantavirus.

4. Psychosocial Hazards:

- Stress and Fatigue: Long working hours, demanding physical labour, and working away from home can lead to stress, fatigue, and mental health issues.
- Isolation: Workers may experience social isolation and lack of support systems, increasing the risk of mental health problems.

5. Community Health and Safety:

- Traffic disruptions and accidents: Increased heavy vehicle traffic, road closures or detours, and changes in traffic patterns can lead to traffic congestion, delays, and an increased risk of accidents for both motorists and pedestrians.
- Noise and vibration: Construction activities, including the use of heavy machinery and equipment, can generate significant noise and vibration, potentially causing disturbance, sleep disruption, and stress for nearby residents.

- Dust and air pollution: Construction sites can generate dust and air pollution from various sources, such as excavation, demolition, and the movement of vehicles and materials. This can exacerbate respiratory problems and other health issues for people in the vicinity.
- Safety hazards: Construction sites pose various safety risks to the community, such as falling objects, exposed wires and cables, and unstable structures. These hazards increase the potential for injuries and accidents.
- Conflict hazards: during the construction works, conflicts may arise between the construction workers and local residents, especially farmers active in the OHL corridors and along access roads.

B. Operation phase:

1. Electrical Hazards:

- Live Line Maintenance: Workers performing maintenance on energized lines are at risk of electric shock and arc flash.
- Unauthorized Access: Public access to OHL corridors can lead to accidental contact with energized equipment.

2. Community Health and Safety:

- Electromagnetic Fields (EMFs): There are ongoing concerns about the potential health effects of EMFs emitted by OHLs, although research is still inconclusive.
- Visual Impacts: OHLs can impact the visual aesthetics of the landscape, potentially affecting the well-being and mental health of nearby residents.

Table 9.38. Health and safety related impacts of the Project

Physical hazards	
Impact	Hazards of physical damage caused on the construction and maintenance sites
Receptor sensitivity	High – all receptor categories
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are localized - Likelihood of the impacts is high for workers, and low for residents

	- Impact magnitude is high, unless preventive measures are taken
Impact importance	Importance of the impacts is high
Chemical hazards	
Impact	Hazards originating from working with hazardous materials and asbestos
Receptor sensitivity	High – all receptor categories
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are localized - Likelihood of the impacts is high for workers, and low for residents - Impact magnitude is high, unless preventive measures are taken
Impact importance	Importance of the impacts is high
Biological hazards	
Impact	Hazards of vector-borne and zoonotic diseases
Receptor sensitivity	High – all receptor categories
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are localized - Likelihood of the impacts is high for workers, and low for residents - Impact magnitude is high, unless preventive measures are taken
Impact importance	Importance of the impacts is high
Psychosocial hazards	
Impact	Stress caused due to long work periods and staying away from homes
Receptor sensitivity	High - workers
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are localized - Likelihood of the impacts is high - Impact magnitude is high

Impact importance	Importance of the impacts is high
Electrical hazards	
Impact	Electrocution during maintenance works and unauthorized access to the Project facilities
Receptor sensitivity	High
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are localized - Likelihood of the impacts is high Impact magnitude is high
Impact importance	Importance of the impacts is high
Community health and safety	
Impact	- Health and safety concerns of local communities, including concerns about electromagnetic fields and visual impacts - Safety hazards, e.g. locals being injured as a result of construction works and emergence of conflict situations
Receptor sensitivity	High
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are localized - Likelihood of the impacts is moderate - Impact magnitude is high
Impact importance	Importance of the impacts is high

9.13.6. Proposed impact management measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.39 is recommended.

9.13.7. Residual impacts

As a result of the above mitigation measures, the severity of the Project's identified impacts is expected to be significantly lower.

Table 9.39. Measures to manage health and safety related impacts

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Physical hazards	High	Working at height	**1.** Implementation of a comprehensive fall protection program, including guardrails, safety nets, personal fall arrest systems, and training for workers on fall prevention techniques. **2.** Regular inspection and maintenance of scaffolding, ladders, and other equipment used for working at height	Low
		Electrical hazards	**1.** Enforcement of lockout/tagout procedures to de-energize equipment before maintenance or repairs. **2.** Providing workers with insulated tools and PPEs designed for electrical work. **3.** Training workers on electrical safety hazards and procedures	
		Heavy machinery operation	**1.** Ensuring that operators are properly trained and certified to operate heavy machinery. **2.** Regular inspection and maintenance machinery to ensure safe operation. **3.** Implementation of traffic control measures to separate vehicles and pedestrians on construction sites.	
		Falling objects	**1.** Installation of toe boards on scaffolding and platforms to prevent objects from falling. **2.** Requiring workers to wear hard hats at all times on site	
		Trenching and excavation	**1.** Using shoring or sloping techniques to prevent trench collapses. **2.** Testing the air quality in trenches and confined spaces before entry.	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Manual handling	**3.** Training workers on proper lifting techniques and ergonomic principles to reduce the risk of musculoskeletal injuries. **4.** Using mechanical aids, such as hoists or cranes, to lift heavy objects.	
		Noise and vibration	**1.** Using noise barriers, enclosures, or quieter equipment to reduce noise levels. **2.** Providing workers with hearing protection devices (HPDs) and enforce their use in noisy areas	
		Dust and fumes	**1.** Using water sprays, misting systems, or other dust suppression methods to minimize airborne dust. **2.** Providing adequate ventilation in enclosed spaces to control fumes and other airborne contaminants. **3.** Providing workers with respiratory protection equipment (RPE) when necessary	
Chemical hazards	High	Construction and operation phases	**1.** Providing workers with Safety Data Sheets (SDSs) for all chemicals used on site and training them on safe handling procedures. **2.** Requiring workers to wear appropriate PPE, such as gloves, goggles, and respirators, when handling hazardous chemicals. **3.** Having spill containment kits readily available to clean up accidental spills of chemicals	Low
Biological hazards	High	Construction and operation phases	**1.** Promoting good hygiene practices, such as handwashing and proper food handling, to reduce the risk of disease transmission	Negligible

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Psycho social hazards	High	Construction phase	**1.** Providing resources for stress management, such as counseling services or employee assistance programs. **2.** Allowing for flexible work schedules to help workers balance work and personal life. **3.** Encouraging a supportive work environment and provide opportunities for workers to connect with each other	Negligible
Comm unity health and safety	High	Pre-construction phase	**1.** Thorough identification of potential health and safety risks to the community, such as noise, dust, traffic, electromagnetic fields (EMFs), and accidents. **2.** Evaluation of the potential severity and likelihood of each hazard, considering vulnerable populations (children, elderly, people with pre-existing conditions). **3.** Creation of a detailed plan outlining specific measures to mitigate or eliminate identified hazards **4.** Establishment of open communication channels with local communities to inform them about the project, address their concerns, and gather feedback on potential health and safety risks. **5.** Involving community members in the decision-making process regarding mitigation measures to ensure their needs and preferences are considered. **6.** Regularly sharing information about the project's progress, safety protocols, and any potential risks to the community **7.** Development of the Code of Conduct which will regulate ethical aspects of interaction with locals, **8.** Training workers of AzerEnerji and contractors on the requirements of the Code of Conduct	Negligible

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Construction phase	**1.** Implementation of noise reduction measures, such as using quieter equipment, installing noise barriers, and scheduling noisy activities during less sensitive hours. **2.** Using water spraying, dust suppressants, or other methods to minimize dust generation and dispersion. **3.** Developing traffic management plans to minimize congestion, ensure pedestrian safety, and maintain access for emergency services. **4.** Enforcing strict safety protocols on construction sites to prevent accidents, including proper training, protective equipment, and regular inspections. **5.** Regular monitoring of air and water quality in the vicinity of the project to detect any potential pollution or contamination. **6.** Monitoring noise and vibration levels to ensure they comply with regulatory standards and to identify any excessive levels that require mitigation. **7.** Establishment of a health surveillance program to monitor the health of community members potentially exposed to project-related hazards. **8.** Maintaining open channels with local communities to prevent conflict situations and resolve such if occurred.	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Operation phase	**1.** Conducting routine inspections of OHL infrastructure to identify and address any potential safety hazards, such as damaged equipment or vegetation encroachment. **2.** Implementation of a vegetation management plan to control vegetation growth under and around the lines, reducing the risk of fire and ensuring safe access for maintenance crews. **3.** Establishment of a mechanism for community members to report any safety concerns or issues related to the OHL. **4.** Provision of accurate and transparent information to the community about EMFs and their potential health effects. **5.** If necessary, considering implementation of EMF mitigation measures, such as grounding or shielding, in areas of high public exposure.	

9.14. Cultural Heritage sites

9.14.1. Scope of assessment

This section assesses potential impacts of the different phases of the AZURE Project on the cultural-historical heritage of the Project area, and suggests respective impact mitigation activities.

Geographical scope of the assessment encompassed OHL corridors, as well as substation areas and safety zones of the Project. The assessment covered both construction and operation phases. The following tasks were performed as part of the assessment:

- Identification of potential impact sources to be generated in connection with the Project activities
- Quantitative and qualitative assessment of potential adverse effects against sensitive receptors
- Defining ways to prevent or minimize the adverse impacts

In order to perform the above-mentioned tasks, studies were aimed at determining potential impacts and their severity levels, estimating quantitative and qualitative changes that might occur in pre-Project quality parameters and sensitive receptors (described in "6.5 Project area baseline" section of the SBS) as a result of such impacts, proposing activities to prevent or minimize the adverse impacts and maximize the positive impacts.

9.14.2. Impact Sources and Sensitive Receptors

The impacts may originate from various sources throughout the project lifecycle. During planning and design, route selection and design choices can directly impact heritage sites. In the construction phase, ground disturbance, heavy machinery, construction traffic, and temporary structures can cause damage and disruption. During operation, visual impact, electromagnetic fields, maintenance activities, and accidents can have negative effects. Additionally, indirect impacts from economic activity and population growth can affect cultural heritage.

Sensitive receptors of the potential impacts are the archaeological sites, historical buildings and structures, sacred places, cultural landscapes, traditional cultural properties and the sensitive social facilities situated close to the OHL corridors and access roads of the Project. Sensitivity level of all receptor types is generally high, especially of the below specific receptors cited in "7.11.3 Sensitive objects identified during field surveys":

Yevlakh district:

- Cemetery of Aksham village– southern edge of the OHL corridor
- Mosque of Aksham village – 220 m to the south of OHL corridor
- Aksham village school – situated on a relatively straight village street (earth road), which can be used as secondary access road
- Cemetery of Gulovsha village – area between two OHLs

Aghdash district:

- Old cemetery with 1 medieval gravestone in the outskirts of Hushun and Kukal villages – on the OHL corridor

Goychay district:

- Goychay cemetery – southern flange of OHL corridors

Aghsu district:

- Dashdemirbeyli cemetery – 100 m to the north of OHL corridors
- Langabiz mosque – situated on Aghsu-Hajigabul road, which will be used as the main access road of the Project
- Secondary school of Baghirli village - situated on Aghsu-Hajigabul road
- Baghirli cemetery - situated on Aghsu-Hajigabul road

Shamakhi district:

- Secondary school of Ovchulu village - situated on Aghsu-Hajigabul road
- Chol Goylar cemetery - situated on Aghsu-Hajigabul road

Hajigabul district:

- Two active XIX-XX century cemeteries on OHL corridors, where people from previously resettled settlements continue burial ceremonies
- Gizilburun cemetery – situated 100 m to the north of OHL corridor.

9.14.3. Project standards

WB ESF ESS 8 on Cultural Heritage is considered as a project standards for this project, including those considered by national legislation and international agreements, as described in Chapter 3 of the ESIA, to ensure that projects respect and preserve cultural heritage, avoid or minimize adverse impacts on it, and promote its conservation whenever possible.

9.14.4. Assumptions and limitations

A. Assumptions

- It is assumed that the project will adhere to all relevant environmental and cultural heritage regulations, including conducting appropriate impact assessments, obtaining necessary permits, and implementing mitigation measures.
- The assessment relies on the availability and accuracy of existing data on cultural heritage sites, sensitive receptors, and environmental conditions. Incomplete or outdated information can lead to underestimation or overestimation of impacts.

- While some impacts can be reasonably predicted, others, such as long-term effects or cumulative impacts, may be more difficult to anticipate accurately.
- The success of mitigation measures in avoiding or minimizing negative impacts is assumed, although their actual effectiveness may vary depending on implementation and unforeseen circumstances.

B. Limitations:

- The assessment focused on specific project components or phases, neglecting potential impacts from related activities or indirect effects
- The assessment involved uncertainties due to gaps in knowledge, data limitations, or the unpredictable nature of some impacts
- The evaluation of cultural significance and the aesthetic impacts of OHL structures can involve subjective judgments, leading to potential disagreements among stakeholders
- The assessment may not account for long-term monitoring of impacts, which is essential for evaluating the effectiveness of mitigation measures and detecting any unforeseen consequences.

9.14.5. Identified impacts

The Project can have various impacts on cultural and historical heritage, both positive and negative.

A. Potential Negative Impacts:

- **Visual Intrusion**: OHL and substation structures, particularly large transmission towers, can significantly alter the landscape and detract from the aesthetic value of historical sites or scenic areas. This visual intrusion can diminish the cultural significance and tourism potential of these locations.
- **Physical Damage**: Construction activities, such as excavation and ground clearing, can directly damage archaeological sites, historical buildings, cultural landscapes, cultural spaces. The vibrations from heavy machinery or pile driving can also weaken the foundations of the structures.
- **Land Use Change**: Clearing large swathes of land can lead to the loss of traditional land uses and disruption of cultural practices associated with specific landscapes.
- **Access Restrictions**: The establishment of security zones or restricted areas around the Project infrastructure can limit public access to cultural heritage sites, hindering research, education, and tourism opportunities.

B. Potential Positive Impacts:

- Improved Infrastructure: In some cases, the access roads of the Project can bring roads to remote or underserved areas, improving living conditions and potentially supporting the preservation and interpretation of cultural heritage sites.

- Economic Development: The construction and operation of OHL projects can generate employment opportunities and stimulate local economies, which may indirectly contribute to the preservation of cultural heritage through increased funding and awareness.

Provided that the Project facilities will be situated sufficiently far from the cultural and historical heritage of the Project area, likelihood of all of the above potential impacts, but physical damage (in case new archaeological sites are discovered during design and construction phases), visual intrusion and economic development were assessed as negligible. A brief description of the impacts is presented in the Table 9.40 below.

Table 9.40. Impacts of the Project to cultural heritage spaces

Physical damage	
Impact	Physical damage as a result of construction and maintenance works
Receptor sensitivity	High
Impact parameters	- The impacts are direct - The impacts are long-term - The impacts are local - Likelihood of the impacts is low - Impact magnitude is high
Impact importance	Importance of the impacts is moderate
Economic development	
Impact	More focus on local historical sites due to the stimulation of local economies
Receptor sensitivity	High
Impact parameters	- The impacts are indirect - The impacts are long-term - The impacts are local - Likelihood of the impacts is high - Impact magnitude is high
Impact importance	Importance of the impacts is high positive
Visual intrusion	
Impact	Lowered aesthetic value of historical sites due to the presence of OHL and substation structures.
Receptor sensitivity	Moderate
Impact parameters	- The impacts are direct

	- The impacts are long-term - The impacts are local - Likelihood of the impacts is moderate - Impact magnitude is moderate
Impact importance	Importance of the impacts is moderate

9.14.6. Proposed impact management measures

In order to mitigate the impacts identified above, implementation of the impact management activities provided in the Table 9.41 is recommended.

Table 9.41. Measures to manage cultural heritage related impacts

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Physical damage	Moderate	Planning / monitoring	**1.** Development of Cultural Heritage Management Plan **2.** Development and implementation of Chance Finds Procedure to address the potential discovery of previously unknown archaeological or cultural heritage materials during project activities **3.** Conducting thorough assessments before construction to identify and evaluate potential risks, allowing for the development of appropriate mitigation measures **4.** Implementation of archaeological investigations to identify and protect significant sites **5.** Implementation of all relevant safety measures during transportation of construction materials and erection of towers to prevent impacts upon the affected graveyards and sensitive social facilities **6.** Continuous monitoring during construction phase to detect and address any unforeseen impacts **7.** Involving local communities and stakeholders in the planning process to ensure that cultural values and concerns are considered, leading to more sustainable and culturally sensitive project outcomes **8.** Where impacts are unavoidable, compensation measures, such as the restoration of damaged sites or the establishment of new cultural facilities, can help offset the negative effects on cultural heritage.	Low
Economic developme nt	High positive	Construction and operation phases	**1.** Exploring opportunities to integrate heritage conservation into project design, such as creating interpretive trails, developing visitor centers, or promoting cultural tourism initiatives **2.** Considering adaptive reuse of existing historical structures for project-related purposes, such as converting old buildings into offices or visitor centers **3.** Incorporation of public art installations or interpretive signage that highlight the cultural significance of the project area and its heritage resources.	High positive

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
Visual intrusion	Moderate	Construction phase	**1.** Prioritizing routes that avoid or minimize proximity to sensitive visual receptors, such as historic sites, scenic areas, or residential communities **2.** Considering undergrounding or burying cables in sections where visual impact is a major concern **3.** Utilizing existing utility corridors or shared rights-of-way to reduce the overall footprint of new infrastructure **4.** Opting for tower designs that blend with the natural landscape, or using materials and colours that minimize visual contrast. **5.** Varying tower heights and configurations to reduce repetitive patterns and create a more visually interesting profile **6.** Strategical placing towers to take advantage of natural screening elements like hills, vegetation, or existing structures **7.** Conducting thorough visual impact assessments to identify potential visual impacts and evaluate the effectiveness of proposed mitigation measures. **8.** Using visual simulations and photomontages to illustrate the project's visual impact and communicate mitigation strategies to stakeholders **9.** Implementation of dust control measures to minimize visual impacts from construction activities.	Low
		Operation phase	**1.** Implementation of landscaping and revegetation plans to restore disturbed areas and screen OHL infrastructure. **2.** Using native plant species that blend with the local environment and require minimal maintenance **3.** Engage with local communities and stakeholders throughout the project to address concerns about visual impacts and gather feedback on mitigation strategies **4.** Considering incorporation of public art or interpretive elements into the project design to enhance the visual appeal and cultural significance of the infrastructure	

İmpact type	Magnitude	Mitigation measures		Post-action magnitude
		Environment	Description	
		Monitoring	**1.** Conducting regular inspections to identify and address any visual impacts that may arise during operation, such as vegetation encroachment or equipment deterioration **2.** Implementation of a maintenance plan to ensure that structures and landscaping remain in good condition, minimizing visual clutter and maximizing screening effectiveness	

10. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

10.1. Introduction

Current Chapter contains description of the measures to be taken by AzerEnerji to ensure proper implementation of the impact management measures proposed by the Chapters "9. Environmental Impact Assessment" and "10. Socio-Economic Impact Assessment" of the Report.

The recommended measures refer to both the national baseline requirements for environmental management during construction and the World Bank ESF/ESSs, as the project is being prepared and implemented under the World Bank ESF/ESSs. Therefore, in case of any inconsistency, the World Bank ESF/ESSs shall prevail.

Azerenerji will conduct additional biodiversity studies to assess the ROW of the T-Line that is likely to see migratory birds; from fall 2024 to spring 2025 to fill the gaps identified in the current Draft BMP Biodiversity Assessment (Annex 7). The results and recommendations of this additional study will be used to update the ESIA, ESMP, BMP and C-ESMP.

The above studies will be carried out by the existing Biodiversity/Ornithology Consultant within the Consultant Iglim team. However, if the analysis of the relevant data and preparation of mitigation measures as required and consistent with ESS6 is not sufficient, another consultant may be engaged under WB HEIS. According to the specifications provided in the bidding documents, each civil works contract will include specific provisions that require and provide measures for bird protection throughout the alignment, based on a per unit cost that will be refined following the update of the ESMP and BMP.

10.2. Tasks and Objectives

Environmental and Social Management Plans (ESMP) cover the principles, objectives and requirements appropriate for the implementation of effective environmental and social management during all phases of the Project. It is inevitable for a Project developer to be assigned with the following responsibilities for the management of the natural and socioeconomic environment within all project phases:

- Prevent or mitigate potential adverse impacts;
- Increase effect of the potential positive impacts;
- Ensure timely and effective implementation of the impact management measures provided for in the ESIA; and
- Monitor any positive and adverse impact management process.

The following tasks have been set based on this ESIA to ensure the effective implementation of the above-mentioned obligations:

- Detailed explanation of the impact management measures identified under the ESIA and the procedures for their implementation;
- Identifying the parties responsible for the implementation of these measures;
- Application of the system of compliance with relevant legal requirements, obligations and responsibilities within the project:
- Establishment of a monitoring and reporting system to be implemented during the project.

ESMPs also serve to raise attention to the specific requirements to be monitored under the project, and appropriate actions will need to be taken if environmental impacts are not adequately prevented or mitigated. Therefore, ESMPs shall be considered as a guide to help minimize the potential environmental and social impacts of the project activities.

In addition, ESMPs set out the rules to be followed to ensure the implementation of impact management measures by covering recommendations with regard to the roles and responsibilities of Project implementers, environmental management team and contractors.

ESIA has adopted a cautious approach, or “best practice” philosophy, if such recommended by the management. In order to ensure that the environmental and socioeconomic impact management measures of the Project are implemented in a timely and efficient manner in line with the guidelines, the basics of the Project's environmental and socioeconomic monitoring programs are reflected in ESMP as well.

10.3. Implementation Period

Implementation period of the ESMPs covers the entire Project lifetime.

10.4. Responsibility of Parties

Effective environmental and social management during Overhead Line (OHL) construction and operation is critical for ensuring the sustainability of these projects. Numerous stakeholders play vital roles in mitigating environmental and social risks and promoting positive impacts throughout the project lifecycle.

The Project Implementation Unit, Azerenerji and its contractors shall clearly demonstrate how environmental and socioeconomic aspects will be managed during all phases of the Project. All organizations and staff to be involved in the project shall be clearly explained of their environmental and social responsibilities to ensure that the impact management measures identified under the ESMPs are implemented in accordance with the requirements and recommendations of ESIA. The breakdown of the responsibilities of the different parties involved in overseeing and carrying out the project is presented Annex 11.

10.5. Impact Management Hierarchy

The impact management hierarchy for the AZURE Project will follow a tiered approach, prioritizing the avoidance or minimization of negative impacts. Here's a general outline of the hierarchy:

1. Avoidance:

- **Route Selection**: Carefully choosing the OHL route to avoid sensitive areas like protected habitats, cultural heritage sites, and residential areas. The management measures were undertaken during Project design and scoping phase of the Project. However, additional measures might be required if any high-magnitude and hard-to-mitigate impact is identified during the Construction phase.
- **Technology Selection**: Considering alternative technologies where feasible, such as underground cables, to avoid potential visual or environmental impacts of overhead lines.
- **Construction Methods**: Employing construction techniques that minimize disturbance to the environment, such as using helicopters for tower erection in inaccessible areas to reduce the need for access roads.
- **Construction Schedule**: scheduling construction activities so that they do not overlap with bird migration and reproduction periods.

2. Minimization:

Environmental Mitigation: Implementing measures to reduce impacts on biodiversity, such as:

- Wildlife-friendly tower designs to prevent bird collisions.
- Measures to minimize disturbance to wildlife and habitats.
- Measures to protect critical habitats and nature protection areas
- Minimum excavation and land clearing works, storage of fertile soil cover for future rehabilitation works
- Erosion control measures to protect water quality.
- Minimization of land-use, ecosystem services and landscape related impacts
- Organization of proper waste management system.

Social Mitigation: Addressing impacts on communities, such as:

- Measures to mitigate noise, vibration and light pollution impacts during construction and transportation works.
- Traffic control measures on the access roads.
- Measures aimed to address health and safety concerns of the communities.
- Community engagement and communication throughout the project lifecycle.

3. Management:

- **Monitoring**: Continuously monitoring environmental and social impacts during construction and operation phases to identify any unforeseen issues.
- **Adaptive Management**: Adjusting mitigation measures or project activities as needed based on monitoring results.
- **Emergency Response:** Having plans in place to address any unexpected incidents or accidents that may occur.

4. Rehabilitation:

- Rehabilitation of fertile soil cover after the completion of construction works
- Rehabilitation of landcover in the areas of land clearance
- Rehabilitation of disturbed or lost habitats.

5. Compensation:

- **Financial Compensation**: Providing financial compensation to landowners or communities for unavoidable impacts, such as loss of land use or property value. Compensation for land acquisition or crop damage.
- **In-Kind Compensation**: Offering alternative resources or benefits to offset impacts, such as community development projects or improvements to local infrastructure.

10.6. ESMP Revision and Update

ESMPs are dynamic and flexible documents that can be reviewed and updated. There might always be any unforeseen issues during the implementation of any project, therefore this ESMPs can be reviewed and amended to mitigate unforeseen impacts as and when necessary. Any amendments shall be agreed with the MENR.

10.7. Training and Registration

The Client shall determine any training courses cited in the respective management plans above (and also conduct registration for participation in such courses) he offers to conduct on the environmental issues, including staff awareness of environmental issues.

The Contractors shall demonstrate which records should be maintained as part of this environmental management process. This information should also determine where the documents should be kept and who is responsible for their safekeeping. Such documents should include: training, monitoring, project review; duration of meetings; method statements, procedures; agreements / licenses, etc.

10.8. Control

Taking into consideration that control and monitoring is one of the key conditions for the successful implementation of ESIA, monitoring of ESIA level of efficiency is crucial for the Project.

Control over the implementation of the Project in line with ESIA requirements should be exercised by the Supervision Engineer (SE) to be appointed by Azerenerji. SE shall perform the following project-related functions:

- Explain ESIA content to Contractors;
- Conduct daily on-site control over the activities to implement during all phases of the Project;
- Conduct regular monitoring and audit of the Project in order to verify that the project activities are implemented in line with ESIA requirements;
- Prepare reports based on the results of monitoring and audit activities and provide written feedback to Azerenerji and its contractors;
- Make suggestions on how to address the deficiencies identified during the control, monitoring and audit activities and monitor their implementation.

Reports prepared by SE should be heard at subsequent meetings of the Project executors, and reports and notices on urgent matters should be reported to Azerenerji and contractors immediately or as soon as possible. All reports on ESIA implementation status and the results of the environmental monitoring program should be duly registered, summarized and retained by Azerenerji .

All measures that will cause an emergency situation at the project facilities or lead to severe environmental and socio-economic impacts should be suspended until mitigation or prevention measures are implemented.

10.9. Non-compliance

Below are the steps to be taken in connection with the deterioration of environmental and social issues. The principle is that the solution of as many problems as possible should not go beyond the initial phases.

Step 1: SE shall discuss the issue with Azerenerji, Contractor or other guilty party and they shall resolve the issue together. SE shall keep a record of the discussion and the solution applied and shall submit it to Azerenerji.

Step 2: If the SE detects a more serious infringement of rules, it shall notify the guilty party in writing, and provide a time to resolve the issue.

Step 3: SE requires Azerenerji or Contractor to suspend the work in part or in whole. Temporary suspension shall be applied until the infringement is made good and the risk of adverse impacts is minimized.

Step 4: Violation of the terms and conditions of the contract - One of the possible consequences of the above is the removal of the contractor and / or equipment from the site and / or the termination of the contract - either the construction contract or the employment contract.

Prior to the commencement of the project activities, the costs of mitigation measures for the environment and socio-economic environment shall be included in the contract after having been agreed with Azerenerji and his contractors, or the contractor shall place a security deposit amount agreed between the contractor and Azerenerji . If the mitigation measures provided for in ESIA are not fully implemented, the security deposit amount should be forfeited.

10.10. Environmental and Social Management Plans

As a key part of ESIA this section encompasses the environmental and social management measures for the construction and operation phases of the AZURE Project. It should be noted that the environmental, safety and health management plans developed or to be developed by Azerenerji for individual processes and procedures in the project area have not been incorporated into this ESIA.

Tables 10.1 and 10.2 contain the measures to address potential adverse and positive environmental and social impacts likely to be generated during both Project phases, detailed assessment of which is given in the “Chapter 9. Impact Assessment”.

This section of the report describes mitigation measures to reduce impact to the “acceptable / Negligible” or ‘very low importance” or ” very low Importance by taking mitigation measures” levels, limit, eliminate, or compensate. When taking mitigation measures, the practical consequences of implementing these measures must be kept in mind. Both costs and impacts can be minimized by advanced planning.

During the mobilisation period, the Contractors shall mobilise their equipment and aggregates at the designated locations within the territories of the following facilities operated by AzerEnerji Mingachevir HPP, Azerbaijan TPP, 110 kv Mingachevir SS, 220 kv Aghdash SS, 220 kv Aghsu SS, Navahi SS, Alat FEZ, 220 kv Sangachal SS, Absheron-Garadagh WPP and Gobu SS. Each camp will occupy no more than 1 hectare of the site. The design of the camps as well as Camp Management Plan will be developed and shared with the Client prior to the start of the construction phase.

A site-specific ESMP with (associated supplementary plans (traffic management plan, waste management plan, erosion and sediment control plan, health and safety plan, and other plans listed in the respective sections in Tables 10.1-10.2) will be prepared and submitted to the Client and the Bank for review and approval during mobilisation. In particular, a traffic management plan covering the use of access roads shall be agreed with the local authorities prior to construction.

Prior to construction, community meetings shall be held to introduce the Contractor and Supervising Engineer to the nearby communities, inform the people of the commencement of construction activities, the extent of temporary impacts and mitigation measures to be taken, and to expand employment opportunities for skilled and unskilled labour by delivering outreach programs to inform local communities about job opportunities and recruitment processes.

Local communities will also be informed about the functioning of the GRM and the contact details of the Contractor's and SE's contact persons will be provided to the communities.

Table 10.1. Environmental and Social Management Plan: construction phase

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Air Quality							
Dust emissions	Emissions of dust and particulate matter during movement of vehicles and transportation of the construction materials / equipment Emissions of dust and particulate matter during land clearing, excavation and slope cutting works	High	Low	Preparation and implementation of Dust Management Plan Regular watering of construction sites, access roads and stockpiles Designating specific areas for material storage and handling, Installing temporary barriers or fences	Azerenerji Contractor Construction manager Environmental supervisor Procurement manager	Dust Management Plan Mitigation measures Training materials Air quality monitoring reports	31500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Breaking down construction activities into phases Using chemical dust suppressants to bind dust particles and prevent them from becoming airborne Enforcing speed limits on construction sites and access roads Restriction of Project traffic in the areas outside			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				designated roads Maintenance of the tire pressure in the vehicles Cleaning vehicle tires and undercarriages before exiting construction sites Using covered trucks for transporting loose materials Keeping construction equipment well-maintained Ensuring that exhaust systems			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				on vehicles and equipment are in good working order Using equipment with advanced emission control technologies Training drivers and equipment operators on dust minimization Continuous monitoring of dust levels around construction sites and access roads, reporting of the			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				monitoring results			
Pollutant and greenhouse gases	VOCs and NOx emissions as a result of fuel consumption	High	Low	Preparation and implementation of Air Emissions Management Plan Planning construction activities Planning efficient transportation routes	Azerenerji Contractor Construction manager Environmental supervisor Transport manager Procurement manager	Air Emissions Management Plan Construction schedules Transportation route maps Mitigation measures Training materials	
	CO2, CH4 and N2O emissions as a result of fuel consumption						31500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Pollutant and greenhouse gases				Providing shuttle services for workers Using newer, fuel-efficient equipment with advanced emission control technologies Using larger trucks with higher carrying capacity Considering hybrid or electric-powered alternatives for smaller vehicles and equipment Deployment of telematics		Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				systems to monitor equipment performance, fuel consumption, and idle time Keeping engines idle when not in use Regular maintenance of construction equipment and vehicles Timely replacement of obsolete machines and equipment			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Regular check and adjusting of the tire pressure Training equipment operators and drivers in eco-driving techniques Regular check of compliance of emission indicators with the standards in motor transport and equipment			
Fugitive emissions	Release of VOCs and other pollutants during concrete mixing, painting, and welding	Moderate	Low	Rigorous inspection for all construction equipment to identify and	Azerenerji Contractor Construction manager	Leak Detection and Repair Program Mitigation measures	38000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				repair leaks promptly Adhering to manufacturer-recommended maintenance schedules to ensure proper functioning of seals, gaskets, and other components Implementation of Leak Detection and Repair Program using appropriate technologies like infrared cameras or gas detectors to identify and	Environmental supervisor Procurement manager	Training materials Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				quantify leaks, followed by timely repairs Ensuring that proper shutdown procedures are followed Storing materials in designated areas with appropriate containment measures Conducting frequent inspections of storage tanks Utilizing secondary			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				containment systems Installation of vapor recovery systems on storage tanks Ensuring that all valves, flanges, and seals on storage tanks are in good working condition and replaced when necessary Training the workers on the importance of fugitive emissions control, proper equipment operation, leak			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				identification, and reporting procedures. Conducting awareness campaigns to inform workers and nearby communities about the potential impacts of fugitive emissions and the mitigation measures in place			
Smoke	Release of PM, CO, NOx, VOCs and PAHs with the smoke due to planned and unplanned	Moderate – planned	Low	Exploring alternative land clearing methods not involving fires	Azerenerji Contractor Construction manager	Fire fighting plans Mitigation measures	31500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	burning of the vegetation cover	High - unplanned		Burning during periods of favourable weather conditions Avoiding burning during periods of drought or high fire risk Checking air quality forecasts before burning Obtaining necessary permits from relevant authorities Informing local fire departments	Environmental supervisor Safety manager	Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				and nearby communities Establishing firebreaks around the area to be burned Starting small, controlled fires Setting controlled fires against the wind Monitoring the burn area closely Implementing rehabilitation measures to restore soil health and promote vegetation			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				regrowth after the burn The use of fire-resistant construction materials Ensuring that swift response is given to reported fires Conducting post-fire assessments			
Noise, vibration, light pollution							
Noise	Noise generated by heavy machinery	Hight – construction phase	Low	Preparation and implementation of Noise Management Plan Selection and use of	Azerenerji Contractor Construction manager Environmental supervisor	Noise Management Plan Complaints procedure	31500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				equipment with lower noise emissions Using electric or hybrid machinery where possible Regular maintenance of equipment Employing quieter operating techniques Erection of temporary noise barriers or walls Optimization of the layout of construction sites	Safety manager Procurement manager	Mitigation measures Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Requesting the nearby third party people to keep away from the close proximity to the noisy activities Providing workers with ear protection Tailoring noise mitigation measures to the local context Scheduling noisy activities during less sensitive times Informing locals about the construction schedule and			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				planned noise mitigation measures Establishment of complaints procedure to address noise concerns from residents promptly Regular monitoring of the noise levels Review and adjustment of noise mitigation measures based on monitoring results and feedback from locals			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Vibration	Vibration generated by heavy machinery	High	Low	Choosing construction sites that minimize the proximity to vibration-sensitive receptors Thorough geotechnical investigations Using specialized software and modeling techniques to predict vibration levels at sensitive receptors If pile driving is necessary, considering	Azerenerji Contractor Construction manager Environmental supervisor Safety manager Procurement manager	Trigger vibration levels Complaints procedure Mitigation measures Monitoring reports	31500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				using alternative methods Selection of machinery with built-in vibration isolation features or add-on damping systems Maintenance of equipment to minimize unnecessary vibrations Using smooth and controlled movements of machinery Placing vibration isolation pads or mats under			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				heavy machinery Installation of damping materials on structures or equipment Comprehensive vibration monitoring program Establishment of pre-defined trigger vibration levels Maintaining open communication with stakeholders			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Light pollution	Light pollution due to the construction activities and camps	Moderate	Low	Using fully shielded light fixtures that direct light downward Utilizing the lowest intensity lighting Choosing LED lights with warm colors (more yellow or reddish), which are less disruptive to nocturnal wildlife than cool colors (more bluish) Employing adaptive lighting systems	Azerenerji Contractor Construction manager Environmental supervisor Procurement manager	Mitigation measures Monitoring reports	17500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Implementing curfews or timers Utilizing motion sensors to activate lights only when needed Ensuring that lighting fixtures are regularly cleaned and maintained Planting trees or shrubs around substations Using smart lighting systems			
Soil quality							

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Excavation and removal	Removal of fertile and underlying soil cover as a result of basement excavation works	High	Low	Making sure that only required volumes of topsoil are removed Preventing the soil from mixing with other materials used in construction Construction of special topsoil storage sites at certain intervals of the Project Regular watering of and protection of the storage sites from contamination,	Azerenerji Contractor Construction manager Environmental supervisor	Mitigation measures Monitoring reports	37800

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				wind and water erosion Quality monitoring of the fertile soil stored in the above areas After the construction phase ends, use of stored fertile soil in the soil cover rehabilitation activities within and outside the Project area			
Soil disturbance	Compaction, erosion, loss of structure, fertility and agricultural productivity,	High	Low	Ensuring that OHL routes minimize the need for extensive clearing and	Azerenerji Contractor Construction manager	Soil Erosion Prevention Plan	26500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	during the construction works			grading, avoiding sensitive areas such as wetlands, steep slopes, and prime agricultural lands Comprehensive plan outlining measures to prevent soil erosion and sediment runoff Soil compaction minimization Planning efficient transportation routes	Environmental supervisor Transportation manager	Soil Compaction Minimization Plan Transportation Routes map Mitigation measures Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Providing shuttle services for workers Installing and maintaining silt fences, sediment basins, and erosion control blankets Preventing soil compaction through limiting vehicle traffic, using low ground pressure equipment and avoiding working on wet soils After the construction works finish, revegetation of			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				the disturbed areas Regular inspection of erosion and sediment control measures Ensuring compliance with all relevant environmental regulations and permit requirements			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Contamination	Contamination as a result of accidental leaks, spills and disposals of non-hazardous and hazardous wastes Contamination as a result of leakages from the maintenance vehicles, herbicide use, transformer oil leaks or the metal's corrosion	High	Low	Thorough environmental site assessment to identify potential contamination sources and assess the existing soil quality Development of a comprehensive plan outlining measures to prevent soil contamination during construction phase Establishment of protocols for preventing and	Azerenerji Contractor Construction manager Environmental supervisor Safety manager	Site assessment reports Soil Contamination Plan Spill response protocols Waste Management Plan Mitigation measures Training materials Monitoring reports	26000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				responding to spills of hazardous materials Development of a plan for the proper handling, storage, and disposal of all waste generated during construction and operation, including hazardous waste Regular maintenance and inspection of equipment Implementation of the spill prevention and response			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				procedures, e.g. providing spill kits, and establishing designated spill response areas Implementation of the waste management plan to ensure proper waste handling, storage, and disposal If soil contamination is identified, remediation of the contaminated soil in place If unaffordable soil			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				contamination is identified, soil removal and replacement Training of workers on spill response and waste management protocols Regular monitoring of the soil quality in areas where contamination is likely to occur After remediation / replacement of the contaminated soil cover, organization of a			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				long-term monitoring of the soil quality			
External sources	Contamination and erosion as a result of air depositions, runoff, erosion and mud volcanism	Moderate	Low	Avoiding OHL routes and station locations from being too close to the sources of hazards Planting and continuous maintaining of healthy vegetation cover	Azerenerji Contractor Construction manager Environmental supervisor	Hazard maps Monitoring reports Mitigation measures	26000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				In the areas close to the mountain slopes, building terraces on slopes to slow down water flow and reduce erosion Construction of drainage systems Creating retention ponds to capture the runoff water Using permeable pavements to let water to infiltrate the ground			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Developing hazard maps to identify areas at risk Wherever possible, deploying engineering solutions such as diversion channels or barriers			
Water Quality							
Contamination from soil erosion and sedimentation	Migration of soil erosion and sedimentation material to the water bodies of Kur, Alijanchay, Turyanchay, Goychay, Girdimanchay, Aghsuchay and	High	Low	Implementation of the soil impact mitigation measures Retaining existing vegetation	Azerenerji Contractor Construction manager Environmental supervisor	Mitigation measures Inspection and Monitoring reports	26000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	Pirsaat rivers, and to the irrigation canals			whenever possible Revegetation of disturbed areas promptly with native vegetation Design and implementation of stormwater management systems Installation of erosion control structures such as silt fences, sediment basins, check dams, and fiber rolls Stabilization of slopes using techniques like			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				terracing, retaining walls, or geotextile fabrics Regular inspections of erosion control measures and drainage systems Regular removal of accumulated sediment from sediment basins and traps Monitoring water quality in the affected rivers and streams			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Contamination by wastes	Contamination of water bodies by spills, leaks, and waste	High – construction phase Moderate – operation phase	Negligible	Implementation of spill prevention and response plans for all hazardous materials used during construction and operation Ensuring proper treatment and disposal of wastewater from construction camps and maintenance activities Using herbicides judiciously, following best management practices	Azerenerji Contractor Construction manager Environmental supervisor	Monitoring reports	30500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				In case the water contamination is identified, taking urgent action to remove its' consequences Regular monitoring of the water quality in affected water bodies Ensuring compliance with all relevant environmental regulations and permit requirements			
Biodiversity							

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Loss, fragmentation and alternation of habitats	Loss and fragmentation of habitats due to clearing of vegetation, erection of OHL towers and emergence of linear barriers	High	Low	Minimizing construction of new access roads Avoiding clearing vegetation during nesting and breeding (1 April-31 July) Using selective clearing techniques to retain important vegetation features Implementation of revegetation plans that prioritize native plant species	Azerenerji Contractor Construction manager Environmental supervisor Biodiversity experts	Transportation route maps Revegetation and habitat rehabilitation plans Mitigation measures Monitoring reports	21000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Restoring disturbed areas by replanting native vegetation Maintenance or restoration of wildlife corridors			
Soil disturbance and erosion	Impacts on aquatic biodiversity due to the disruption of soil by excavation and grading works	High – construction phase Moderate – operation phase	Low	Implementation of soil quality and water quality impact mitigation measures	Azerenerji Contractor Construction manager Environmental supervisor	Mitigation measures Monitoring reports	26500
Disturbance to wildlife	Disturbance to wildlife caused by noise, human presence and machinery operation	High	Low	At Papadagh, ensure that no pylons for the new 500 kV line are placed in front of the rock hill with the Saker Falcon *Falco cherrug* nest site (but rather, well to either side of the hill). Also, periodically monitor falcon nesting	Azerenerji Contractor Construction manager Environmental supervisor	Transportation route maps Vegetation plans Mitigation measures	18000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				activity and success at the site. At Varvara Wetland, Papadagh, and other sensitive bird nesting areas (noted in Table 6.15), schedule construction activities outside of the main breeding and nesting periods (1 April-31 July) Implementation of measures to reduce noise and light pollution Establishing buffer zones around sensitive habitats to minimize disturbance and provide refuge for wildlife Limiting construction activities to designated areas and minimize noise and light pollution to reduce stress on wildlife If nests are encountered at the construction sites, avoiding their disturbance by	Biodiversity experts	Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				erecting special fences Training construction personnel on wildlife awareness, including non-lethal and safe relocation of slow-moving wildlife (such as snakes and turtles)			
Bird collision risks	Collision of birds with overhead transmission lines Electrocution of large birds with wide wingspans when perching or flying near power lines	High	Moderate	Bird flight path studies to identify areas with high bird activity in Spring 2025 (already done for Autumn 2024) Installation of bird flight diverters (flappers, fireflies, or spirals) on the	AzerEnerji Contractor Construction manager Environmental supervisor Biodiversity experts Procurement manager	Flight path study reports Mitigation measures Monitoring reports	30500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				grounding and conducting wires in the more sensitive OHL segments (noted in Table 6.15). Ensure adequate spacing between conductors and grounded components, to prevent electrocution of large, perched birds (this is expected with the pylon types to be procured.) Using insulated conductors and covered jumpers			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Installation of perch guards or deterrents, where needed to prevent the soiling of conducting wires or other OHL equipment by perched birds.			
Waste							
Excavated soil, vegetation and rock debris	Emergence of solid wastes as a result of soil excavation and land clearing activities	High	Low	Assessment of the project area to identify soil types, vegetation cover, and geological formations Development of a comprehensive	Azerenerji Contractor Construction manager Environmental supervisor Waste management specialist	Assessment reports Waste Management Plan Mitigation measures Monitoring reports	36500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				waste management plan Ensuring that all activities comply with national waste management and environmental protection regulations Minimizing the volume of excavated material Implementing soil erosion control measures Separation of different types			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				of excavated material (soil, vegetation, rock) Implementation of topsoil management measures Disposal of unsuitable or excess soil in designated landfills If contaminated soil is encountered, implementation of appropriate remediation measures before reuse or disposal			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Minimizing vegetation removal Chipping or mulching woody debris for use as ground cover, erosion control, or biomass fuel Composting suitable vegetation debris Disposal of unsuitable or excess vegetation debris in designated composting facilities or			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				approved disposal sites Preventing the spread of invasive plant species through careful handling and disposal of vegetation debris Crushing and Screening of rock debris to produce usable materials Reusing larger rocks for erosion control, retaining walls, or landscaping features.			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Disposal of excess or unsuitable rock debris in designated landfills or approved disposal sites Monitoring the effectiveness of waste management practices and adjust strategies as needed to ensure environmental protection			
Construction waste	Emergence of wood, metal, concrete and plastic wastes formed by the	High	Low	Careful estimation of material quantities to avoid over-	Azerenerji Contractor Construction manager	Contacts with waste carriers and landfills Construction Waste	39000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	leftovers of the construction materials			ordering and minimize surplus Using construction techniques and designs that minimize waste generation Prioritizing reusable formwork, scaffolding, and packaging materials Setting up separate bins and collection areas for different waste types Provision of designated,	Environmental supervisor Waste management specialist Procurement manager	Management Plan Mitigation measures Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				secure areas for storing different waste streams Labelling of waste containers Implementation of spill prevention and containment measures Planning of transportation routes to minimize travel distances and fuel consumption. Using licensed waste transporters with appropriate			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				vehicles and permits for transporting hazardous waste. Tracking of waste transportation Recycling of materials like metals, wood, concrete, and cardboard through partnerships with recycling facilities Reusing materials like wood and metal on-site or in other projects			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Disposal of non-recyclable waste in designated landfills Engaging licensed hazardous waste disposal companies to handle and dispose of hazardous materials safely and in compliance with respective regulations Regular maintenance of equipment and infrastructure to prevent breakdowns and			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				reduce the need for replacements Repairing or refurbishing equipment instead of replacing it whenever possible. Storing spare parts and materials properly Continuing recycling programs for materials like scrap metal during maintenance activities			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Industrial waste	Emergence of liquid and solid, hazardous and non-hazardous wastes during operation of vehicles and equipment	High	Low	Using materials and chemicals with lower environmental impact and toxicity Implementation of strict protocols for handling and storing hazardous materials to prevent spills and leaks. Streamlining construction processes to minimize waste generation and maximize efficiency.	Azerenerji Contractor Construction manager Environmental supervisor Waste management specialist Procurement manager	Industrial Waste Management Plan Spill kits Contracts with waste carriers and utilizers	30500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Establishment of separate, clearly marked storage areas for different types of industrial waste Using appropriate containers (e.g., drums, tanks) for storing hazardous waste, ensuring they are properly sealed and labeled. Having spill kits readily available to contain and clean up accidental spills			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				of hazardous materials Engaging licensed hazardous waste transporters with specialized equipment and expertise for safe transportation Transporting hazardous waste to licensed treatment facilities Maintaining detailed records of waste generation, transportation, and disposal			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Regular inspections of equipment and infrastructure Routine maintenance to prevent equipment malfunctions			
Solid domestic waste	Production of solid domestic waste in construction sites, camps and offices	High	Low	Purchasing materials with minimal packaging and those that are recyclable or compostable. Encouraging reuse of materials and equipment whenever possible.	Azerenerji Contractor Construction manager Environmental supervisor Waste management specialist Procurement manager	Solid Waste Management Plan Training and awareness raising materials Contracts with waste carriers and utilizers Mitigation measures	30500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Implementation a comprehensive waste segregation system at worker camps and construction sites, providing separate bins for different waste streams (organic, recyclable, non-recyclable). Establishing on-site composting facilities to process organic waste Implementation of waste reduction	PR manager	Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				practices at operational facilities Conducting regular awareness programs for workers and staff on proper waste segregation, recycling, and disposal practices Working with local communities to promote waste reduction and recycling initiatives Regular Collection of			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				waste from designated collection points. Using appropriate vehicles and containers for transporting waste to prevent littering and spills. Transporting waste to designated disposal or recycling facilities that comply with environmental regulations Maximizing recycling of			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				materials like paper, cardboard, plastics, glass, and metal through partnerships with recycling centers. Disposal of non-recyclable waste in designated landfills, following proper procedures to minimize environmental impact. Monitoring waste generation and disposal practices			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				throughout the project lifecycle and report results to relevant stakeholders			
Wastewater	Production of wastewater in construction/operation facilities, camps and offices	High	Negligible	Development of wastewater management plan Training workers on proper wastewater handling and disposal procedures to minimize wastewater generation Exploring the use of new technologies, such as closed-	Azerenerji Contractor Construction manager Environmental supervisor Waste management specialist Procurement manager	Wastewater Management Plan Mitigation measures Contracts with wastewater carriers Training materials Monitoring reports	26000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				loop systems for washing equipment Providing adequate portable toilets and handwashing stations for workers Collecting greywater separately from blackwater Transportation of wastewater to the respective treatment facilities for proper handling Monitoring of a potential for			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				groundwater contamination, implement a monitoring program to detect any changes in water quality and take corrective action if needed Monitoring of the quality of nearby streams, rivers, or other water bodies to assess the effectiveness of wastewater management practices			
Ecosystem services							

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Aesthetic value	Changes in the aesthetic value of landscapes and natural/historical landmarks as a result of construction of new OHLs	Moderate	Negligible	Visual impact assessment to systematically assess the potential visual impacts of the project and identify mitigation measures In the regions with significant cultural or historical landscapes, considering the potential impact of OHLs on traditional viewsheds and sacred sites Designing structures	Azerenerji Contractor Construction manager Environmental supervisor Waste management specialist Procurement manager	Visual impact assessment report Revegetation plans Mitigation measures Monitoring reports Grievance mechanisms	17500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				(towers, conductors) to harmonize with the natural topography and vegetation Where feasible and cost-effective, considering undergrounding lines in particularly sensitive areas Involving local communities and stakeholders early in the planning process Carefully planning access roads and			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				staging areas to minimize vegetation clearing and soil disturbance Implementation of comprehensive restoration plans to re-establish native vegetation and rehabilitate disturbed areas after construction Carefully managing vegetation under and around lines to maintain views and prevent			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				tree-conductor conflicts, while promoting native plant growth			
Biodiversity	Impacts on biodiversity during construction and operation phases of the project	High	Low	Implementation biodiversity related impact mitigation measures	Azerenerji Contractor Construction manager Environmental supervisor Biodiversity specialists	Mitigation measures Monitoring reports Grievance mechanisms	30500
Regulatory potential of soil / erosion control	Losses in the regulatory and erosion control potentials of soil as a result of land clearing and excavation	High	Low	Implementation of soil and water quality related impact mitigation measures Ensure restoration of	Azerenerji Contractor Construction manager Environmental supervisor	Mitigation measures Monitoring reports Grievance mechanisms	15500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				temporarily disturbed and trampled farmlands and pastures upon completion of construction works in the designated project area. Ensure proper waste management on pasture and farmland in accordance with the waste management plan. Where necessary, topsoil will be removed prior			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				to commencement of earthworks and restored upon completion of construction. Proper levelling will be ensured			
Grasslands	Reduction in the area of grasslands available for pasturing	Low	Negligible	Designing lines to cross grasslands at the narrowest possible point Considering using shorter towers or monopole structures in grasslands Designing the project to minimize	Azerenerji Contractor Construction manager Environmental supervisor Biodiversity experts	Route maps Mitigation measures Monitoring reports Grievance mechanisms	23000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				impacts on flowering plants and consider planting pollinator-friendly species under lines Scheduling construction activities outside of critical periods like nesting seasons for grassland birds or flowering periods for key plant species Implementation of strict soil erosion control measures during construction			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Using a carefully selected seed mix of native grassland species for restoration, ensuring it matches the local plant community			
Air quality	Aggravation in air quality related ecosystem service during the construction phase	High	Low	Implementation of air quality related impact mitigation measures	Azerenerji Contractor Construction manager Operation manager Environmental supervisor	Mitigation measures Monitoring reports Grievance mechanisms	26000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Agricultural goods	Temporary reduction in the volumes of local agricultural production	High for local farmers	low	Scheduling construction activities outside of critical farming periods Carefully stripping and storage of topsoil separately before construction to preserve its fertility Ensuring that construction activities don't block access to fields or disrupt existing drainage patterns	Azerenerji Contractor Construction manager Environmental supervisor HR manager	Mitigation measures Monitoring reports Grievance mechanisms	37800

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Implementation of EMI shielding or grounding measures. Preventing herbicides used for vegetation management under lines from drifting onto crops, using targeted application methods or alternative vegetation management techniques. Establishing a fair compensation program for farmers in case			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				of land acquisition and accidental crop damage			
Landscape visual perception							
Landscape fragmentation	Visual division of the landscapes by vertical and linear structures of the Project OHLs	Moderate	Low	Minimizing the width of the right-of-way to reduce habitat disturbance and maintain connectivity Considering undergrounding OHLs in sensitive areas Using directional drilling techniques to install underground cables with	Azerenerji Contractor Construction manager Environmental supervisor Landscape specialist	Mitigation measures Monitoring reports	10800

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				minimal surface disturbance in sensitive areas. Careful positioning individual towers and structures to avoid the closure of view of important landscape components.			
Landscape industrialization	Introduction of industrial feel into otherwise natural or rural landscapes	Moderate	Low	Utilizing shorter towers or monopole structures where feasible to reduce their visual prominence Choosing muted colours for	Azerenerji Contractor Construction manager Environmental supervisor Landscape specialist	Mitigation measures Monitoring reports	15000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				towers and conductors that blend with the surrounding environment Using materials with non-reflective surfaces to reduce glare and visual impact. Involving local communities in the planning process to understand their concerns about visual impacts and incorporate their feedback into the project design.	HR manager		

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Installation of interpretive signage along roads or trails near the OHL to educate the public about the project and its visual mitigation measures			
Light pollution of landscapes	Nighttime light pollution originating from aviation warning lights on tall towers (where adjacent to an airport)	Low	Negligible	Utilizing the lowest intensity lighting necessary to meet safety requirements. Minimizing light pollution by using shielded fixtures, directional lighting, or	Azerenerji Contractor Construction manager Environmental supervisor Landscape specialist	Mitigation measures Monitoring reports	15000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				dimming technologies.			
Sociodemographic impacts							
Temporary population increase	Temporary increase of population in the affected communities due to influx of outside workers Temporary increase of the demand for renting houses in the affected communities	Moderate	Low	Establishment of a proactive and ongoing communication channel with local communities Ensuring that temporary construction camps with have adequate facilities (accommodation, catering, sanitation) to house workers on-site Where possible, hiring local workers	Azerenerji Contractor Construction manager PR manager Procurement manager	Influx Management Plan Labour Management Procedure Assessment reports Camping designs	34500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				who already have housing in the area to reduce the demand for accommodation			
Inflation	Inflation of prices for local goods and services	Low	Negligible	Assessment of the local market before the project begins Establishing a price monitoring system to track changes in the prices of essential goods and services Collaborating with local businesses to increase the supply of goods and services to	Azerenerji Contractor Construction manager PR manager Financial manager Procurement manager	Assessment report Mitigation measures Monitoring reports	21500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				meet the increased demand Provision of subsidies or incentives to businesses to encourage them to maintain affordable prices Educating workers about the potential impact of their spending on local prices Seeking alternative options for workers to access goods and services			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				In extreme cases of price gouging, implementation of temporary price controls on essential goods and services to protect consumers Enforcement of existing anti-gouging laws to deter businesses from taking advantage of the situation and unfairly raising prices.			
Social dynamics	Altering of the social dynamics, leading to increased traffic, noise, and	High	Low	Involving local communities in the planning and decision-making processes from	Azerenerji Contractor Construction manager	Community investment projects	20300

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	potential conflicts with locals			the early stages of the project Provision of cultural sensitivity training to workers Investing in community projects and initiatives that address local needs Hiring local workers and sourcing goods and services from local businesses Establishment of effective grievance	PR manager	Training materials Contracts with local employees Monitoring reports Grievance mechanism	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				mechanisms to address complaints and resolve conflicts between the project and local communities.			
Land acquisition	Concerns and losses associated with acquisition of privately owned land spots and restriction of rights	High	Low	Establishment of effective grievance mechanisms Ensuring that land acquisition processes are transparent, fair, and involve meaningful consultation with affected landowners and communities Prompt and fair compensations	Azerenerji Supervision Engineer Financial manager PR manager	Resettlement Action Plan Contracts with land owners Grievance mechanism Monitoring reports	36100

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				for acquired land Where feasible, providing equivalent or better quality land to replace the lost land. Offering property value guarantees or compensation to residents whose property values may be negatively affected by the project Compensation for the lands where an easement is registered			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				where restrictions on land rights result in diminished value of the land. Offering support for relocation and resettlement, including assistance with finding new land and/or income-generating opportunities. Implementing programs to help affected people restore their livelihoods, including vocational			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				training, microcredit schemes, and agricultural support Providing access to alternative resources, such as communal lands, fishing areas, or forests, to compensate for lost access Implementation programs to improve the productivity of remaining land and resources, such as irrigation schemes or sustainable			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				agricultural practices Timing of works to minimise/avoid temporary restrictions on agricultural activities and to allow PAP to collect harvested crops Negotiating with local authorities to secure temporary access to grazing areas during temporary pasture restrictions due to construction work			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Economic welfare, employment opportunities							
Economic activity	Triggering of local economic activity during construction phase of the project	High positive	High positive	Fostering partnerships with local businesses for construction needs Sourcing goods and services from local businesses Establishment of community benefit funds to support local projects and initiatives that contribute to	Azerenerji Construction manager Financial manager PR manager	Community benefit funds Partnership and procurement agreements Community investment projects Monitoring reports	25200

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				long-term economic growth and resilience Investing in community projects and initiatives that address local needs and priorities Continuing to foster partnerships with local businesses for ongoing maintenance and operational needs Providing support to local businesses to			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				help them adapt to the changing economic landscape Maintaining open communication channels with the community to address any ongoing economic concerns			
Employment opportunities	Creation of new jobs for local residents	High positive	High positive	Implementation of the Project's Labour	Azerenerji Contractors	Labour Management Plan	20700

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	Difference between wages of the Project employees and local residents (hired and non-hired by the Project)	High adverse	Low	Management Plan Ensuring that all contractors develop and implement their LMPs in line with general LMP of the Project Active recruiting and hiring local workers for construction jobs, providing them with training and skill development opportunities Reaching out to underrepresented groups within the community	Construction manager Financial manager PR manager	Community employment reports Training materials Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				to ensure equal access to employment opportunities Establishment of a fair and transparent wage structure that ensures equal pay for equal work, regardless of worker origin During hiring, ensuring the transparency regarding wage structures and compensation packages Encouraging collective bargaining			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				agreements between workers and employers Avoiding discrimination based on gender, ethnicity, or social status Conducting outreach programs to inform local communities about job opportunities and recruitment processes Organization of training			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				programs to local residents Maintaining open and transparent communication with local communities and workers regarding employment and wage policies Issuance of regular reports on the project's employment and wage data, including the number of local and non-local workers hired			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				and their average wages			
Restrictions	Limitation and restriction of access to construction sites and project facilities	High	Low	Scheduling construction activities to minimize disruption to local access and movement patterns. Provision of temporary access routes or crossings during construction to maintain	Azerenerji Construction manager Financial manager PR manager	Construction schedules Agreements with land owners Grievance mechanism	30500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				connectivity for communities Negotiating agreements with landowners to allow continued access to their properties under certain conditions Creation of designated public access points along OHL corridors Development of alternative routes for local communities or livestock			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Implementation of the grievance mechanism			
Infrastructure and Transport							
Traffic intensity	Increased traffic intensity, road closures and detours during the construction phase	High – district and village roads	Low	Assessment of existing traffic patterns, road conditions, and potential congestion points before construction begins Development of Traffic Management Plan and its' communication to local communities, businesses, and	Azerenerji Construction manager Transport manager PR manager	Road assessment reports Traffic Management Plan Emergency Response Plan Online traffic updates Road inspection reports Monitoring reports	37100

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				emergency services Identifying designated routes for construction vehicles and materials transport Implementation of traffic control measures Development and implementation of an emergency response plan Public awareness campaigns to inform local residents about		Grievance mechanism	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				construction schedules, traffic detours, and safety precautions Provision of real-time traffic updates through online platforms, mobile apps, or variable message signs Scheduling deliveries and heavy equipment transport during off-peak hours to minimize traffic congestion			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Dividing the project into phases and scheduling activities strategically Providing shuttle services for workers to reduce the number of individual vehicles on the road Collaboration with local transit authorities to enhance public transportation options to and from the construction site			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Working closely with local authorities, traffic police, and community groups Regular inspections of roads used by construction vehicles Implementation of dust suppression measures Maintaining vegetation along the roads and OHL corridors			
Noise and vibration	Inconvenience of the residents of near-road	High	Low	Implementation of noise / vibration impact	Azerenerji Contractors	Mitigation measures	21500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	houses as a result of noise and vibration on the access roads			mitigation measures	Construction manager Transport manager	Monitoring reports Grievance mechanism	
Visual impacts	Concerns about visual impact of OHL towers and lines on roads, bridges, and other transportation infrastructure	Low	Negligible	Designing OHL structures with consideration for visual impact on transportation infrastructure, using colours and materials that blend with the surroundings	Azerenerji Construction manager Transport manager	Mitigation measures	13500
EMI	Electromagnetic interference from OHLs, which can sometimes interfere with traffic signals,	High	Negligible	EMI shielding or grounding measures to prevent interference with sensitive	Azerenerji Construction manager Transport manager	Mitigation measures	17500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	railroad crossings, or other electronic control systems			electronic systems			
Health / safety							
Physical hazards	Working at height	High	Low	Comprehensive fall protection program Regular inspection and maintenance of scaffolding, ladders, etc.	Azerenerji Contractors Construction manager Safety manager Environmental supervisor PR manager Transport manager	HSE documents Training materials Inspection reports Mitigation measures Monitoring reports Grievance mechanism	40300
	Electrical hazards			Enforcement of lockout/tagout procedures Providing workers with insulated tools and PPEs			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Training workers on electrical safety hazards and procedures			
	Heavy machinery operation			Ensuring that operators are properly trained and certified to operate heavy machinery Regular inspection and maintenance of machinery Implementation of traffic control measures			
	Falling objects			Installation of toe boards on scaffolding and platforms to			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				prevent objects from falling. Requiring workers to wear hard hats at all times on site			
	Trenching and excavation			Using shoring or sloping techniques to prevent trench collapses Testing the air quality in trenches and confined spaces before entry			
	Manual handling			Training workers on proper lifting techniques and ergonomic principles			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Using mechanical aids, such as hoists or cranes, to lift heavy objects			
	Noise and vibration			Using noise barriers, enclosures, or quieter equipment Providing workers with hearing protection devices (HPDs)			
	Dust and fumes			Using water sprays, misting systems, or other dust suppression methods			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Providing adequate ventilation in enclosed spaces Providing workers with respiratory protection equipment (RPE)			
Chemical hazards	Hazards originating from working with hazardous materials and asbestos	High	Low	Providing workers with Safety Data Sheets (SDSs) for all chemicals used on site and training them on safe handling procedures. Requiring workers to wear appropriate PPE	Azerenerji Contractors Construction manager Safety manager	Safety data sheets Spill containment kits Mitigation measures Monitoring reports	18000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Having spill containment kits readily available to clean up accidental spills of chemicals			
Biohazards	Hazards of vector-borne and zoonotic diseases	High	Negligible	Implementing vector control measures, such as insecticides or repellents, to reduce the risk of insect-borne diseases. Promoting good hygiene practices, such as handwashing and proper food handling, to reduce the risk of disease transmission	Azerenerji Contractors Construction manager Safety manager	Mitigation measures Monitoring reports	18000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Psychosocial hazards	Stress caused due to long work periods and staying away from homes	High	Negligible	Providing resources for stress management Allowing for flexible work schedules Encouraging a supportive work environment and providing opportunities for workers to connect with each other	Azerenerji Contractors Construction manager Psychologist PR manager	Mitigation measures Monitoring reports	15000
Community health and safety	Concerns about electromagnetic fields, visual impacts and health/safety concerns	High	Low	Thorough identification potential health and safety risks to the community, such as noise, dust, traffic,	Azerenerji Contractors Construction manager Transport manager	Emergency Management and Response Plan	40500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				electromagnetic fields (EMFs), and accidents. Evaluation of the potential severity and likelihood of each hazard, considering vulnerable populations Creation of a detailed plan outlining specific measures to mitigate or eliminate identified hazards Establishment of open communication channels with	Safety manager PR manager	Community health / safety mitigation plan Traffic management plans Health surveillance program Mitigation measures Monitoring reports Grievance mechanism	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				local communities Involving community members in the decision-making process regarding mitigation measures Sharing information about the project's progress, safety protocols, and any potential risks to the community Implementation of noise			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				reduction measures Using water spraying, dust suppressants, or other methods to minimize dust generation and dispersion. Developing traffic management plans to minimize congestion, ensure pedestrian safety, and maintain access for emergency services. Enforcing strict safety protocols			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				on construction sites Regular monitoring of air and water quality in the vicinity of the project Monitoring noise and vibration levels Establishment of a health surveillance program Implementation of a vegetation management plan Establishment of a mechanism for			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				community members to report any safety concerns or issues related to the OHL construction Development of the Code of Conduct which will regulate ethical aspects of interaction with locals, Training workers of AzerEnerji and contractors on the requirements of the Code of Conduct			
Cultural-Historical heritage							

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
Physical damage	Physical damage to the historical sites as a result of construction works	Moderate	Low	Development of Cultural Heritage Management Plan, including mapping of CH features and making this available to construction contractors, so they can plan for expected sensitivities and arrange for CH specialists to undertake site investigations and provide expert guidance as necessary. Also to include a Chance Finds Protocol,	Azerenerji Contractors Construction manager PR manager	Cultural Heritage Management Plan Assessment reports Mitigation measures Monitoring reports	10800

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				whereby a stop work/work around and CH resources are brought in to manage unexpected finds. Conducting thorough assessments before construction Implementation of archaeological investigations Continuous monitoring during construction phase to detect and address any			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				unforeseen impacts Involving local communities and stakeholders in the planning process Where impacts are unavoidable, compensation measures, such as the restoration of damaged sites or the establishment of new cultural facilities			
Economic development	More focus on local historical sites due to the	High positive	High positive	Exploring opportunities to integrate heritage	Azerenerji Contractors	Management measures	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
	stimulation of local economies			conservation into project design Considering adaptive reuse of existing historical structures for project-related purposes Incorporation of public art installations or interpretive signage	Operation manager PR manager		15000
Visual intrusion	Lowered aesthetic value of historical sites due to the presence of OHL and substation structures	Moderate	Low	Undergrounding or burying cables in sections where visual impact is a major concern	Azerenerji Contractors Construction manager PR manager	Visual impact assessment reports Mitigation measures	13500

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Opting for tower designs that blend with the natural landscape, or using materials and colours that minimize visual contrast. Varying tower heights and configurations Strategical placing towers to take advantage of natural screening elements Conducting visual impact assessments		Monitoring reports Grievance mechanism	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget, USD
				Using visual simulations and photomontages to illustrate the project's visual impact and communicate mitigation strategies to stakeholders Implementation of dust control measures to minimize visual impacts from construction activities.			
Total budget for implementation ESMP for construction phase							1 280 000

Table 10.2. Environmental and Social Management Plan: Operation phase

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Air Quality							
Dust emissions	Emissions of dust and particulate matter during movement of vehicles and transportation of the construction materials / equipment Emissions of dust and particulate matter during land clearing, excavation and slope cutting works	Moderate	Negligible	Enforcing speed limits on the access roads and rights-of-way Restriction of Project traffic in the areas outside designated roads Maintenance of the tire pressure in the vehicles Cleaning vehicle tires and undercarriages before exiting maintenance sites	Azerenerji Contractor Operation manager Environmental supervisor	Mitigation measures Monitoring reports	9000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Using covered trucks for transporting loose materials Ensuring that exhaust systems on vehicles and equipment are in good working order Using equipment with advanced emission control technologies Training drivers and equipment operators on dust minimization Monitoring dust levels during			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				maintenance activities			
Pollutant and greenhouse gases	VOCs and NOx emissions as a result of fuel consumption	Moderate	Negligible	During maintenance works, following the access routes identified during the construction phase Using newer, fuel-efficient equipment with advanced emission control technologies Considering hybrid or electric-powered	Azerenerji Contractor Operation manager Environmental supervisor Transport manager Procurement manager	Construction schedules Transportation route maps Mitigation measures Training materials Monitoring reports	9000
	CO2, CH4 and N2O emissions as a result of fuel consumption						

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				alternatives for smaller vehicles and equipment Deployment of telematics systems to monitor equipment performance, fuel consumption, and idle time Keeping engines idle when not in use Regular maintenance of maintenance equipment and vehicles Timely replacement of obsolete			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				machines and equipment Regular check and adjusting of the tire pressure Training equipment operators and drivers in eco-driving techniques Regular check of compliance of emission indicators with the standards in motor transport and equipment			
Fugitive emissions	Release of VOCs and other pollutants during repair and	Low	Negligible	Adhering to manufacturer-recommended maintenance schedules to	Azerenerji Contractor	Leak Detection and Repair Program	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
	replacement works			ensure proper functioning of seals, gaskets, and other components Implementation of Leak Detection and Repair Program using appropriate technologies like infrared cameras or gas detectors to identify and quantify leaks, followed by timely repairs Ensuring that proper shutdown	Operation manager Environmental supervisor Procurement manager	Mitigation measures Training materials Monitoring reports	9000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				procedures are followed Training the workers on the importance of fugitive emissions control, proper equipment operation, leak identification, and reporting procedures.			
Smoke	Release of PM, CO, NOx, VOCs and PAHs with the smoke due to unplanned burning of the vegetation cover	High	Low	Identification of the areas prone to fire outbreaks Conducting regular vegetation management activities	Azerenerji Operation manager Environmental supervisor Safety manager	Fire fighting plans Mitigation measures Monitoring reports	9000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Monitoring of weather conditions to prevent fires Installation of early warning systems Implementation and enforcement of fire restrictions during periods of high fire risk Ensuring that swift response is given to reported fires Conducting post-fire assessments			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Corona discharge	Release of small amounts of ozone and nitrogen oxides under certain weather conditions	Moderate	Negligible	Increasing the conductor diameter Using bundled conductors Using corona rings	Azerenerji Contractor Operation manager Environmental supervisor Safety manager	Mitigation measures	9000
Noise, vibration, light pollution							
Light pollution	Light pollution of the air due to the Project activities and facilities	Moderate	Low	Using fully shielded light fixtures that direct light downward Utilizing the lowest intensity lighting	Azerenerji Contractor Construction manager Operation manager	Mitigation measures Monitoring reports	6800

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Choosing LED lights with warm (yellowish or reddish) colors, which are more wildlife-friendly than cool (bluish) colors Employing adaptive lighting systems Implementing curfews or timers Utilizing motion sensors to activate lights only when needed Ensuring that lighting fixtures are regularly	Environmental supervisor Procurement manager		

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				cleaned and maintained Maintaining plantations around Project facilities Using smart lighting systems			
Soil quality							
Soil disturbance	Compaction, erosion, loss of structure, fertility and agricultural productivity, during the maintenance works	Moderate	Negligible	Comprehensive plan outlining measures to prevent soil erosion and sediment runoff Following efficient transportation routes during maintenance works	Azerenerji Contractor Operation manager Environmental supervisor Transportation manager	Soil Erosion Prevention Plan Transportation Routes map Mitigation measures Monitoring reports	18000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Maintaining silt fences, sediment basins, and erosion control blankets Preventing soil compaction through limiting vehicle traffic, using low ground pressure equipment and avoiding working on wet soils Regular inspection of erosion and sediment control measures Maintaining vegetation cover			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				and controlling invasive species Ensuring compliance with all relevant environmental regulations and permit requirements			
Contamination	Contamination as a result of accidental leaks, spills and disposals of non-hazardous and hazardous wastes	Low	Negligible	Following the Soil Contamination Plan developed during construction phase Following the protocols for preventing and responding to	Azerenerji Contractor Operation manager Environmental supervisor Safety manager	Site assessment reports Soil Contamination Plan Spill response protocols	18000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
	Contamination as a result of leakages from the maintenance vehicles, herbicide use, transformer oil leaks or the metal's corrosion			spills of hazardous materials Following the plan for the proper handling, storage, and disposal of all waste generated during construction and operation, including hazardous waste Regular maintenance and inspection of equipment Implementation of the spill prevention and response procedures, e.g.		Waste Management Plan Mitigation measures Training materials Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				providing spill kits, and establishing designated spill response areas Implementation of the waste management plan to ensure proper waste handling, storage, and disposal If soil contamination is identified, remediation of the contaminated soil in place If unaffordable soil contamination is			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				identified, soil removal and replacement Training of workers on spill response and waste management protocols Regular monitoring of the soil quality in areas where contamination is likely to occur After remediation / replacement of the contaminated soil cover, organization of a long-term			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				monitoring of the soil quality			
External sources	Contamination and erosion as a result of air depositions, runoff, erosion and mud volcanism	Moderate	Low	Maintainance of healthy vegetation cover Maintenance of drainage systems and retention ponds Continuous monitoring of mud volcano activity Updating the hazard maps	Azerenerji Contractor Operation manager Environmental supervisor	Hazard maps Monitoring reports Mitigation measures	9000
Water Quality							

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Contamination from soil erosion and sedimentation	Migration of soil erosion and sedimentation material to the water bodies of Kur, Alijanchay, Turyanchay, Goychay, Girdimanchay, Aghsuchay and Pirsaat rivers, and to the irrigation canals	Low	Negligible	Implementation of the soil impact mitigation measures Regular inspection and maintenance of stormwater management systems and erosion control structures Regular removal of accumulated sediment from sediment basins and traps Monitoring water quality in the affected rivers and streams	Azerenerji Contractor Operation manager Environmental supervisor	Mitigation measures Inspection and Monitoring reports	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Contamination by wastes	Contamination of water bodies by spills, leaks, and waste	Moderate	Negligible	Implementation of spill prevention and response plans for all hazardous materials used during construction and operation Using herbicides judiciously, following best management practices In case the water contamination is identified, taking urgent action to remove its' consequences Regular monitoring of	Azerenerji Contractor Operation manager Environmental supervisor	Monitoring reports	21600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				the water quality in affected water bodies Ensuring compliance with all relevant environmental regulations and permit requirements			
Biodiversity							
Loss, fragmentation and alternation of habitats	Loss and fragmentation of habitats due to clearing of vegetation, erection of OHL towers and emergence of linear barriers	High	Low	Maintenance of new plantations and habitats Seasonal monitoring of bird migration routes Monitoring effectiveness of	Azerenerji Contractor Operation manager Environmental supervisor Biodiversity experts	Mitigation measures Monitoring reports	18000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
	Altering of microclimates and vegetation patterns due to the presence of power lines and associated infrastructure			mitigation measures Adapt management practices as needed to address any unforeseen impacts Monitoring and management of predator-prey interactions			
Soil erosion	Impacts on aquatic biodiversity due to the disruption of soil by excavation and grading works	Moderate	Negligible	Implementation of soil and water quality impact mitigation measures	Azerenerji Contractor Operation manager Environmental supervisor	Mitigation measures Monitoring reports	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Disturbance to wildlife	Disturbance to wildlife caused by noise, human presence and machinery operation	Moderate	Low	Continuous thorough surveys to identify wildlife species present in the project area, their habitats, and any critical corridors or sensitive areas. Scheduling maintenance works outside of breeding and nesting periods Measures to reduce noise and light pollution Limiting maintenance works to	Azerenerji Contractor Construction manager Environmental supervisor Biodiversity experts	Transportation route maps Vegetation plans Mitigation measures Monitoring reports	14400

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				designated areas Training maintenance personnel on wildlife awareness Implementation of vegetation management plans Monitoring wildlife populations and their responses to OHL operation			
Collision risks	Collision of birds with overhead transmission lines	High	Low	Regular inspection of OHLs for	Azerenerji Contractor	Flight path study reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				damaged or worn components Prompt repair or replacement of any damaged components Monitoring of bird activity and collision rates around OHLs, with emphasis on the Little Bustard *Tetrax tetrax* Adapting the management strategies as needed	Operation manager Environmental supervisor Biodiversity experts Procurement manager	Mitigation measures Monitoring reports	18000
Indirect effects	Introduction of invasive species	Moderate	Negligible	Preventing the introduction and spread of	Azerenerji Contractor	Monitoring reports	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
	Human encroachment into previously undisturbed areas			invasive species through proper hygiene practices during construction and ongoing monitoring and control Considering the potential indirect effects of the OHL project on local communities Supporting research to better understand the complex ecological relationships and potential indirect impacts	Operation manager Environmental supervisor Biodiversity experts HR manager	Mitigation measures	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Waste							
Construction waste	Emergence of wood, metal, concrete and plastic wastes formed by the leftovers of the materials used during maintenance works	Moderate	Low	Implementing construction waste reduction measures developed during construction phase Implementation of spill prevention and containment measures Regular maintenance of equipment and infrastructure to prevent breakdowns and reduce the need for replacements	Azerenerji Contractor Environmental supervisor Waste management specialist Procurement manager	Construction Waste Management Plan Mitigation measures Monitoring reports	14400

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Repairing or refurbishing equipment instead of replacing it whenever possible. Continuing recycling programs for materials like scrap metal during maintenance activities			
Industrial waste	Emergence of liquid and solid, hazardous and non-hazardous wastes during operation of vehicles and equipment	Moderate	Low	Implementing industrial waste reduction measures developed during construction phase	Azerenerji Contractor Operation manager Environmental supervisor	Industrial Waste Management Plan Spill kits Contracts with waste carriers and utilizers	14400

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Using materials and chemicals with lower environmental impact and toxicity Implementation of strict protocols for handling hazardous materials Having spill kits readily available to contain and clean up accidental spills of hazardous materials Engaging licensed hazardous waste transporters	Waste management specialist Procurement manager		

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				with specialized equipment and expertise for safe transportation Transporting hazardous waste to licensed treatment facilities Maintaining detailed records of waste generation, transportation, and disposal Regular inspections of equipment and infrastructure Routine maintenance to prevent			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				equipment malfunctions			
Solid domestic waste	Production of solid domestic waste in operated project facilities	Moderate	Low	Implementation of waste reduction practices at operational facilities Conducting regular awareness programs for workers and staff on proper waste segregation, recycling, and disposal practices Working with local	Azerenerji Contractor Operation manager Environmental supervisor Waste management specialist Procurement manager PR manager	Solid Waste Management Plan Training and awareness raising materials Contracts with waste carriers and utilizers Mitigation measures Monitoring reports	14400

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				communities to promote waste reduction and recycling initiatives Monitoring waste generation and disposal practices throughout the project lifecycle and report results to relevant stakeholders			
Wastewater	Production of wastewater in operation facilities	Moderate	Negligible	Implementing wastewater reduction measures developed during	Azerenerji Contractor Operation manager Environmental supervisor	Wastewater Management Plan Mitigation measures	14400

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				construction phase Monitoring of a potential for groundwater contamination, implement a monitoring program to detect any changes in water quality and take corrective action if needed Monitoring of the quality of nearby streams, rivers, or other water bodies to assess the effectiveness of wastewater	Waste management specialist Procurement manager	Contracts with wastewater carriers Monitoring reports	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				management practices			
Ecosystem services							
Aesthetic value	Changes in the aesthetic value of landscapes and natural/historical landmarks	Moderate	Negligible	Carefully managing vegetation under and around lines to maintain views and prevent tree-conductor conflicts, while promoting native plant growth Regular maintenance of structures to prevent rust, wear, and other signs of deterioration	Azerenerji Contractor Operation manager Environmental supervisor	Visual impact assessment Mitigation measures Monitoring reports Grievance mechanisms	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Monitoring program to track the effectiveness of mitigation measures and identify any unforeseen aesthetic impacts that may arise during operation			
Biodiversity	Impacts on biodiversity during operation phase	High	Low	Implementation biodiversity related impact mitigation measures	Azerenerji Contractor Operation manager Environmental supervisor Biodiversity specialists	Mitigation measures Monitoring reports Grievance mechanisms	14400

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Regulatory potential of soil / erosion control	Losses in the regulatory and erosion control potentials of soil as a result of land clearing and excavation	High	Low	Implementation of soil and water quality related impact mitigation measures	Azerenerji Contractor Operation manager Environmental supervisor	Mitigation measures Monitoring reports Grievance mechanisms	9600
Grasslands	Reduction in the area of grasslands available for pasturing	Low	Negligible	Focusing on controlling invasive plant species under and around lines, as these can quickly outcompete native grasses. As grazing is allowed under lines, working with local farmers or land managers to establish sustainable	Azerenerji Contractor Operation manager Environmental supervisor Biodiversity experts HR manager	Mitigation measures Monitoring reports Grievance mechanisms	14400

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				grazing practices that promote grassland health.			
Landscape visual perception							
Landscape industrialization	Introduction of industrial feel into otherwise natural or rural landscapes	Moderate	Low	Managing vegetation under and around the OHL to screen views of the structures and soften their visual impact. Regular maintenance of structures, including painting and cleaning	Azerenerji Contractor Environmental supervisor Landscape specialist	Mitigation measures Monitoring reports	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Light pollution of landscapes	Nighttime light pollution originating from aviation warning lights on tall towers	Low	Negligible	Utilizing the lowest intensity lighting necessary to meet safety requirements. Minimizing light pollution from aviation warning lights by using shielded fixtures, directional lighting, or dimming technologies. Using timers to turn off lights during periods of low activity	Azerenerji Operation manager Environmental supervisor Landscape specialist	Mitigation measures Monitoring reports	9600
Sociodemographic impacts							

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
Social dynamics	Altering of the social dynamics, leading to increased traffic, noise, and potential conflicts with locals	Low	Negligible	Investing in community projects and initiatives that address local needs Hiring local workers Establishment of effective grievance mechanisms to address complaints and resolve conflicts between the project and local communities.	Azerenerji Operation manager PR manager	Community investment projects Contracts with local employees Grievance mechanism	9600
Infrastructure and Transport							
EMI	Electromagnetic interference from OHLs, which can	High	Negligible	EMI shielding or grounding measures to prevent	Azerenerji Construction manager	Mitigation measures	

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
	sometimes interfere with traffic signals, railroad crossings, or other electronic control systems			interference with sensitive electronic systems	Transport manager		18000
improvement of the national / regional power system	Better energy provision of Azerbaijan and regions as a result of new energy transmission infrastructure	High positive	High positive	Due implementation of all adverse impact management measures to maximize its' positive effect	Everyone	Mitigation measures Monitoring reports	18000
Health / safety							
Physical hazards	Working at height	High	Low	Comprehensive fall protection program Regular inspection and maintenance of	Azerenerji Contractors Operation manager	HSE documents Training materials	21600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				scaffolding, ladders, etc.	Safety manager Environmental supervisor PR manager Transport manager	Inspection reports Mitigation measures Monitoring reports Grievance mechanism	
	Electrical hazards			Enforcement of lockout/tagout procedures Providing workers with insulated tools and PPEs Training workers on electrical safety hazards and procedures			
	Heavy machinery operation			Ensuring that operators are properly trained and certified to operate heavy machinery Regular inspection and			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				maintenance of machinery Implementation of traffic control measures			
	Falling objects			Installation of toe boards on scaffolding and platforms to prevent objects from falling. Requiring workers to wear hard hats at all times on site			
	Trenching and excavation			Using shoring or sloping techniques to prevent trench collapses Testing the air quality in			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				trenches and confined spaces before entry			
	Manual handling			Training workers on proper lifting techniques and ergonomic principles Using mechanical aids, such as hoists or cranes, to lift heavy objects			
	Noise and vibration			Using noise barriers, enclosures, or quieter equipment Providing workers with hearing			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				protection devices (HPDs)			
	Dust and fumes			Using water sprays, misting systems, or other dust suppression methods Providing adequate ventilation in enclosed spaces Providing workers with respiratory protection equipment (RPE)			
Chemical hazards	Hazards originating from working with hazardous	High	Low	Providing workers with Safety Data Sheets (SDSs) for all chemicals used on site and	Azerenerji Contractors Operation manager	Safety data sheets Spill containment kits	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
	materials and asbestos			training them on safe handling procedures. Requiring workers to wear appropriate PPE Having spill containment kits readily available to clean up accidental spills of chemicals	Safety manager	Mitigation measures Monitoring reports	
Biohazards	Hazards of vector-borne and zoonotic diseases	High	Negligible	Implementing vector control measures, such as insecticides or repellents, to reduce the risk of insect-borne diseases. Promoting good hygiene practices, such	Azerenerji Contractors Operation manager Safety manager	Mitigation measures Monitoring reports	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				as handwashing and proper food handling, to reduce the risk of disease transmission			
Community health and safety	Concerns about electromagnetic fields, visual impacts and health/safety concerns	High	Low	Creation of a detailed plan outlining specific measures to mitigate or eliminate identified hazards Establishment of open communication channels with local communities Involving community members in the	Azerenerji Contractors Operation manager Transport manager Safety manager PR manager	Community health / safety mitigation plan Traffic management plans Health surveillance program Mitigation measures Monitoring reports Grievance mechanism	18000

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				decision-making process regarding mitigation measures Sharing information about the project's progress, safety protocols, and any potential risks to the community Implementation of dust, noise and vibration reduction measures during maintenance works Implementation of a health			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				surveillance program Conducting routine inspections of OHL infrastructure Implementation of a vegetation management plan Establishment of a mechanism for community members to report any safety concerns or issues related to the OHL. Provision of accurate and transparent information to			

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				the community about EMFs and their potential health effects. If necessary, considering implementation of EMF mitigation measures, such as grounding or shielding, in areas of high public exposure.			
Cultural-Historical heritage							
Economic development	More focus on local historical sites due to the stimulation of local economies	High positive	High positive	Exploring opportunities to integrate heritage conservation into project design	Azerenerji Contractors Operation manager PR manager	Cultural Heritage Management Plan Management measures	9600

Impact category	Impact type	Pre-mitigation magnitude	Post-mitigation magnitude	Management and control measures	Responsible party	Key performance indicators	ESMP budget for 1 year
				Considering adaptive reuse of existing historical structures for project-related purposes Incorporation of public art installations or interpretive signage			
implementation of the EMP at the operational stage (for 1 year)							436400

10.11. Performance Reporting

Reporting on ESHS (Environment, Social, Health, and Safety) performance is crucial for OHL construction and operation projects to ensure transparency, accountability, and continuous improvement.

One of the main requirements for ESHS reporting is its' regular nature. Within the AZURE Project's framework, the reporting frequency will vary depending on the Project phase. Thus, monthly interim and quarterly summary reports will be required during the construction phase, whereas annual report will be required during the operational phase. During construction, the Contractor will prepare monthly interim reports to be submitted to the Supervision Engineer and the PIU. The Supervision Engineer will prepare his own monthly and quarterly reports based on his monitoring, suggested improvements and status of issues identified during monitoring.

Target audience of the ESHS reporting will consist of both internal (PIU, ESHS teams, engineers, supervisors, contractors, general Project staff) and external (government agencies, lenders, communities, NGSs etc.) stakeholders.

The reports will be developed based on the following ESHS performance indicators:

- Environmental:
  - Greenhouse gas emissions
  - Water consumption and discharge quality
  - Waste generation and management
  - Biodiversity impacts (with emphasis on bird collision mitigation)
  - Land disturbance and rehabilitation
- Social:
  - Number of grievances received and resolved
  - Employment of local workforce
  - Conducted stakeholder engagement activities
  - Land acquisition and compensation progress
  - Impacts on vulnerable groups
- Health and Safety:
  - Lost-time injury frequency rate (LTIFR)
  - Total recordable injury frequency rate (TRIFR)
  - Near-miss reporting
  - Occupational health incidents
  - Safety training and compliance

The structure of the reports will consist of the following components:

- Executive Summary: Concise overview of key performance highlights and areas of concern.
- Project Description: Brief summary of the project, its location, and potential ESHS risks.
- Performance Data: Quantitative and qualitative data on ESHS indicators, including targets, actual performance, and trends over time.
- Compliance: Status of compliance with environmental permits, social safeguards, and health and safety regulations.
- Incident Reporting: Details of any significant ESHS incidents, including investigations, root cause analysis, and corrective actions.
- Community Engagement: Summary of engagement activities, feedback received, and grievance resolution.
- Management Response: Discussion of actions taken to address any ESHS challenges or non-compliances.
- Future Plans: Outline of planned ESHS activities and initiatives for the next reporting period.

The reports must be developed based on the ESHS data produced using dedicated software or databases. These databases will be also used for monitoring the Project performance. The ESHS data must be visualized spatially, using GIS to map land disturbance, sensitive habitats, community locations, etc.

In order to make sure that the reports reach maximum audience, they must be published online.

10.12. ESMP COSTS

The estimated costs for the initial implementation of the ESMP are presented in Tables 10.1 and 10.2 above. The costs have been determined based on the initial setup and should be considered preliminary and subject to change. The PMU will review these costs and develop annual operating costs for the ESMP. The costs have been developed based on 30 months of project implementation.

11. MONITORING PLAN AND AUDIT

11.1. Objectives and contents

This Monitoring Plan (MP) will be explicitly integrated into the Project contract and appended to the Technical Specifications. This ensures that the monitoring requirements outlined in this document are legally binding and become an integral part of the project's contractual obligations.

AzerEnerji will oversee the implementation of the Monitoring Plan (MP) throughout the construction and maintenance phases of the Project, ensuring adherence to environmental, health, safety, and social standards. Good engineering practices will be applied to proactively avoid and mitigate potential impacts.

To ensure compliance, AzerEnerji will incorporate relevant environmental protection provisions into contracts with contractors, who are also obligated to adhere to the regulations of the Republic of Azerbaijan. On-site monitoring of national legislation compliance and MP conditions will be conducted by supervising engineers in collaboration with contractors. Monthly reports documenting monitoring results will be submitted to AzerEnerji.

Supervising engineers will proactively address any new significant issues arising during project implementation, proposing mitigation measures to relevant departments within AzerEnerji and to contractors.

Both AzerEnerji and contractors will diligently monitor all aspects of the works, including the full range of mitigation measures for environmental and social impacts, as well as health and safety concerns. Particular attention will be given to pollution control and waste management practices at workplaces and camps.

Currently, various monitoring activities are employed in practice, each with relevance to the ESIA study. The primary types of monitoring are outlined below:

- **Initial Monitoring (Pre-Audit Survey):** Before project activities commence, a comprehensive pre-project study of environmental and socioeconomic baseline conditions is conducted within the Project AoI. This establishes a reference point against which subsequent monitoring can assess changes over time, providing crucial insights into the project's impacts. Baseline studies were already executed as part of the initial screening and ESBS surveys.
- **Impact Monitoring:** Throughout the project implementation phase, continuous monitoring of physio-chemical and socioeconomic parameters (including public health and safety) is carried out within the Project AoI. This aims to detect any changes potentially resulting from the project's activities, allowing for timely identification of impacts and necessary mitigation measures.

- **Compliance Monitoring:** Regular sampling or continuous recording of specific environmental quality indicators or pollution levels is conducted to ensure the project's adherence to recommended environmental protection standards. This proactive approach ensures that the project remains within permissible limits and minimizes potential negative impacts.

By employing these diverse monitoring approaches, a holistic understanding of the project's environmental and social performance can be achieved. This facilitates informed decision-making, adaptive management strategies, and ultimately, a more sustainable project outcome.

Monitoring activities must adhere to a regular schedule and be conducted within predefined timeframes. Any deviations from the approved monitoring schedule could lead to insufficient data collection, hindering the ability to draw accurate conclusions regarding specific project impacts. Consistent and timely monitoring is crucial for maintaining a comprehensive understanding of the project's environmental performance and ensuring effective mitigation measures are implemented as needed.

The Monitoring Plan (MP) will be instrumental in achieving the following objectives:

1. Impact Identification and Tracking: Establish a comprehensive database to systematically identify, document, and analyse both short-term and long-term environmental impacts resulting from the Project.
2. Early Warning System: Serve as an early warning mechanism by promptly detecting any deviations of environmental and social control measures or practices from established standards, facilitating timely corrective actions.
3. Performance Monitoring: Continuously monitor the implementation progress of the project and evaluate the effectiveness of mitigation measures to ensure adherence to environmental commitments and optimize outcomes.
4. Impact Validation: Clarify and validate the environmental impacts initially predicted in the Environmental and Social Impact Assessment (ESIA) study through rigorous monitoring and data collection.
5. Compliance Assurance: Ensure the project remains compliant with all applicable regulatory requirements, industry standards, and government policies throughout its lifecycle.
6. Adaptive Management: Enable adaptive management by identifying unforeseen issues or adverse impacts and implementing appropriate corrective measures to minimize negative consequences.

7. Audit Facilitation: Provide comprehensive and reliable information to support thorough environmental audits, ensuring transparency and accountability in environmental performance.
8. Real-time Data Dissemination: Share real-time observational data relevant to the project's environmental performance through a designated website, fostering transparency and informed decision-making among stakeholders.

By fulfilling these objectives, the Monitoring Plan will play a pivotal role in ensuring the project's environmental sustainability, minimizing adverse impacts, and promoting responsible environmental stewardship.

Table 11.1. Monitoring Plan

Component (element) monitorin	Project phase	Monitoring objectives	Monitoring aspects	Monitoring location	Monitoring Frequency	Monitored parameters[89]
Soil quality	Construction Operation	Determining quality parameters Pollution identification	Physiochemical characteristics Pollutant contents	Project AoI	Monthly	EC,pH, hydrocarbons, metals, etc. depending on potential pollution sources Soil disturbances, erosion, waste and hydrocarbon contamination
Surface water resources	Construction	Determining quality parameters Pollution identification	Physiochemical characteristics Pollutant contents	Kur Alijanchay Turyanchay Goychay Girdimanchay Aghsuchay Pirsaatchay	Quarterly	pH, T, conductivity, turbidity, dissolved oxygen, ORP, turbidity, alkalinity, TSS, basic ions (Ca, Mg, K, Na, Cl, SO4, NO3, NH3, Fe, and NO2) and metals (Al, Sb , As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Zn). E-coli and E-coli Total
Potable water	Construction Operation	Determining quality parameters and safety of drinking water used by employees and local communities	Physiochemical characteristics Pollutant contents	Project AoI	Weekly - key indicators Quarterly - other parameters	**Monthly**: pH, turbidity, TDS, TSS, EC, O2, cyanides, **Quarterly:** pH, T, conductivity, turbidity, TSS, basic ions and ligands (Ca, Mg, Na, K, Cl, SO4, NO3, F, NO2, NH3), metals (Al, Sb, As, Ba, B, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Zn), E-coli and E-coli Total

[89] The parameters to be measured during the monitoring will be agreed with the relevant structures of MENR (in the form of a document incorporated in the Annual Environmental Action Plan))

Component (element) monitorin	Project phase	Monitoring objectives	Monitoring aspects	Monitoring location	Monitoring Frequency	Monitored parameters[89]
Air quality	Construction	Ensuring that air quality does not change negatively	Dust emission	c	Daily	PM2.5, PM10
			Deposited dust	Project AoI Nearest parts of affected settlements	Daily	**Weekly:** Dust, metal concentrations
			Air pollution levels from vehicles and equipment	Construction sites	During technical inspections	**Monthly:** NOx, PM10 and Cox, SO2
Noise	Construction	Impacts on the environment and human health	Noise levels on the construction sites and access roads	Construction sites Access roads Nearest parts of affected settlements	Weekly	**Weekly:** Noise levels (1 hour measurement)
Biodiversity	Construction Operation	Assessment of changes in biodiversity as a result of project activities	Bird collisions with transmission lines, with special focus on Little Bustards *Tetrax tetrax*	Project AoI, especially in Little Bustard wintering areas	Seasonal	Bird collision fatalities by species, in sample power line segments with and without BFDs, according to a standardized scientific protocol
Social / community health	Construction	Identifying changes in social welfare and community health	Negative and positive, socio-economic and health impacts associated with the project	Project AoI Affected settlements	Monthly	Stakeholder outreach Social surveys Grievance procedures

11.2. Reporting

A. Environmental Monitoring and Audit Reports

The format of Environmental Monitoring and Audit (EMA) reports, including Initial, Monthly, Quarterly, Summary, and Final reports, will be submitted both in paper and electronic formats after agreement to MENR. Copies of all reports except the initial one will also be submitted to AzerEnerji.

1. **Monthly EMA Report:**
   - Submitted within 10 working days before the end of each month, starting one month after construction begins.
   - Sent to RIG of Client and MENR.
   - Format (paper and electronic) and number of copies agreed upon before the first submission.
   - Contents:
     - Summary (1-2 pages): Exceedances, complaints, legal actions, report changes, future issues.
     - Basic project information: Organization, contacts, work done.
     - Ecological status: Work details, drawings with locations, coordinates.
     - EMA requirements summary: Parameters, limits, action plans, mitigation measures, contractual requirements.
     - Implementation status: Advice on environmental measures, monitoring results (methodology, equipment, parameters, locations, dates, weather, QA/QC, detection limits).
     - Non-compliance, complaints, legal actions: Records, details, causes, effects, actions taken.
     - Other: Future work review, waste management, comments, recommendations.
     - Additional: Limits, graphs of trends over time, activities, weather, other factors, future monitoring, statistics, upcoming issues.

2. **Quarterly EMA Report:**
   - Approximately five pages.
   - Contents:
     - Summary.
     - Project information: Overview, contacts, work summary.
     - EMA requirements summary.

Implementation status update.

- Drawings of project area, receptors, monitoring stations.
- Graphs of trends over time.
- Waste management information.
- Non-compliance summary, causes, actions.
- Complaints summary, actions taken.
- Comments, recommendations, quarterly results.
- Contact details.
- Final EMA Report:
- Contents:
- Summary.
- Drawings.
- Project information: Overview, contacts, work summary.
- EMA requirements summary.
- Implementation status update.
- Graphs of trends over time.
- Non-compliance summary, causes, actions.
- Complaints summary.
- Legal actions summary.
- Review of ESIA accuracy and gaps.
- Comments on mitigation effectiveness, EMA program.
- Recommendations and conclusions.

The ES will review the monitoring stations and parameters monthly or as needed to adapt to environmental changes and work activities.

B. Reporting to WB

Quarterly reports. AzerEnerji will prepare and submit to WB the regular monitoring reports on the environmental, social, health, and safety (ESHS) performance of the Project, including but not limited to the implementation of the ESCP, status of preparation and implementation of E&S instruments required under the ESCP, stakeholder engagement activities, and functioning of the grievance mechanism(s). The reports will be quarterly and submitted to WB throughout Project implementation commencing after the Effective Date. Each report will be submitted to the World Bank no later than 30 calendar days after the end of each reporting period.

Reporting of incidents and accidents. AzerEnerji will promptly notify the World Bank of any incident or accident related to the Project which has, or is likely to have, a significant adverse

effect on the environment, the affected communities, the public or workers, including, inter alia, cases of sexual exploitation and abuse (SEA), sexual harassment (SH), and accidents that result in death, serious or multiple injury [specify other examples of incidents and accidents, as appropriate for the type of operation]. The reports will include sufficient detail regarding the scope, severity, and possible causes of the incident or accident, indicating immediate measures taken or that are planned to be taken to address it, and any information provided by any contractor and/or supervising firm, as appropriate.

Subsequently, at the World Bank's request, a report will be prepared on the incident or accident and propose any measures to address it and prevent its recurrence. WB shall be notified no later than 48 hours after learning of the incident or accident. The report should be provided to WB within a timeframe acceptable to the WB.

Contractors' reports. Contractors and supervising firms will be required to provide monthly monitoring reports on ESHS performance in accordance with the metrics specified in the respective bidding documents and contracts, and submit such reports to WB. AzerEnerji will attach these reports as annexes to the above quarterly reports.

11.3. Data Storage

On-site documentation, including monitoring field records, laboratory analysis results, and field inspection forms, will not be directly included in the monthly EMA reports. However, the ES is responsible for meticulously maintaining these records and making them available for review upon request.

All pertinent information must be recorded clearly and systematically within these documents. Additionally, observation data will be stored in electronic format and readily accessible for submission upon request. All documentation and information will be retained for a minimum of one year after the completion of the rehabilitation and construction contract.

11.4. Data Confidentiality

The World Bank has strict requirements for data confidentiality to ensure the privacy and protection of sensitive information collected or generated during projects and programs it supports. Here are some of the key requirements:

- **Data Classification**: Data should be classified according to its sensitivity level (e.g., public, confidential, restricted) and appropriate security measures implemented accordingly.

- **Data Collection and Storage**: Data collection should be minimized and only relevant data collected. Data should be stored securely, with access restricted to authorized personnel only.
- **Data Use and Sharing**: Data should only be used for the purposes for which it was collected and shared only with authorized parties with a legitimate need to know.
- **Data Anonymization and De-identification**: Personally Identifiable Information (PII) should be anonymized or de-identified whenever possible to protect individual privacy.
- **Data Retention and Disposal**: Data should be retained only for as long as necessary and disposed of securely in accordance with relevant regulations and policies.
- **Consent and Disclosure**: Informed consent should be obtained from individuals before collecting or using their personal data. Information about data collection, use, and sharing practices should be transparent and disclosed to individuals.
- **Data Security**: Appropriate technical and organizational measures should be implemented to protect data from unauthorized access, use, disclosure, alteration, or destruction.
- **Data Breach Notification**: In the event of a data breach, prompt notification should be made to relevant authorities and affected individuals, in accordance with applicable laws and regulations.

The World Bank also emphasizes the importance of complying with relevant national and international data protection laws and regulations. It provides guidance and tools to help implement these requirements, such as the World Bank's Data Protection and Privacy Policy and the Data Security Guidelines.

It's also important to note that specific data confidentiality requirements may vary depending on the nature of the project or program and the type of data being collected.

If you're involved in a World Bank-supported project, it's important to familiarize yourself with the specific data confidentiality requirements that apply and ensure that appropriate measures are in place to protect sensitive information.

11.5. Interim notes on exceeding environmental quality limits

As per the action plan, if environmental quality limits are exceeded, ES must promptly notify both AzerEnerji and MENR. Following this notification, ES will furnish AzerEnerji and MENR with comprehensive research findings, details on proposed corrective measures and their effectiveness, along with any necessary recommendations for further action. This ensures a transparent and proactive approach to addressing environmental non-compliance, facilitating

informed decision-making, and enabling swift implementation of corrective measures to mitigate adverse impacts.

11.6. Onsite audit and grievance

On-site Inspection. ES should be responsible for the preparation of the environmental inspection in the area, the reporting system for deficiencies and measures, and on-site inspections. He/she shall send a proposal to the Contractor for approval of the inspection and reporting procedures for deficiencies and measures in the area and then submit it to AzerEnerji for approval.

Regular on-site inspections should be conducted at least once a week. Inspection scope should not be limited to the environmental situation within the area, pollution control and mitigation measures, but should review the environmental situation outside the work area, directly or indirectly affected by the activities implemented in the area. When conducting an inspection ES should refer to the below information:

1) ESIA and EMP recommendations with regard to the mitigation measures for environmental protection and pollution control (including dust control measures and best field practice measures for environmental impact),
2) Current results of the EMA Program,
3) Progress of work and work program,
4) Separate work methodology proposals (should include proposals for related pollution control measures),
5) Contract provisions on environmental protection,
6) Relevant laws on environmental protection and pollution control,
7) Results of previous field inspections conducted by ES and others

The Contractor shall always keep the ES informed of the relevant information in the construction contract required for him to conduct site inspections. The results of the inspection and related recommendations to improve the work on environmental protection and pollution control should be sent to Clent and the Contractor within 24 hours for reference and urgent measures.

The Contractor shall follow the procedures and timeframes set out in the reporting system for deficiencies and measures formulated by the ES to report on any corrective action following field inspections.

If significant environmental issues are identified, the ES should also conduct random field inspections. Inspections may also be required upon receipt of an environmental complaint or as part of an environmental monitoring and audit review.

Compliance with Law and Contract Requirements. Azerbaijan has contractual requirements for environmental protection and pollution control, as well as laws on environmental protection and pollution control, and construction works must necessarily comply with these requirements and laws.

The Contractor shall send copies of the relevant documents to the ES on a regular basis to be able to conduct inspection of work. The document should include at least an updated Progress Report, updated Work Programs, applications for any licenses / permits under environmental protection laws, and a copy of all valid licenses / permits. The area log book should also be in place when required for ES inspection.

After reviewing the documents, the ES must inform AzerEnerji and Contractors of any non-compliance with the requirements of the environmental protection and pollution control agreement and legislation in order to take the necessary monitoring measures.

Upon receipt of the information, the Contractor shall take immediate action to remedy the situation. ES should monitor this to ensure that appropriate action is taken to comply with contract and legal requirements.

Complaints. Complaints should be addressed to the ES for action. ES should apply the following procedures upon receipt of any complaints:

1) Register the complaint and enter the date of receipt in the complaint database, as well as inform AzerEnerji immediately,
2) Verify the validity of the complaint and assess whether it is sourced from the project activities being implemented,
3) If the complaint is true and case - related, it should define a mitigation measure in consultation with Client,
4) If mitigation measures are required, the Contractor shall be notified with regard thereto.
5) Consider the Contractor's response to the mitigation measure (s) identified and updated situation;
6) If complaints are received from the RIG, send an interim report on the complaint investigation status and follow-up to the RIG within the timeframe set by the RIG,
7) Conduct additional monitoring and audits to clarify the situation and ensure that the circumstances that led to the complaint will not recur as and when necessary.
8) Inform the complainant regarding results of the investigation and the action taken (if complaint was received from the EIG, the results should be reported within the timeframe set by the EIG),
9) Record the complaint, investigation, relevant measures and results in the monthly Environmental Monitoring and Audit reports.

Complaint evaluation and recording criteria are given in the Figure 11.2 below.

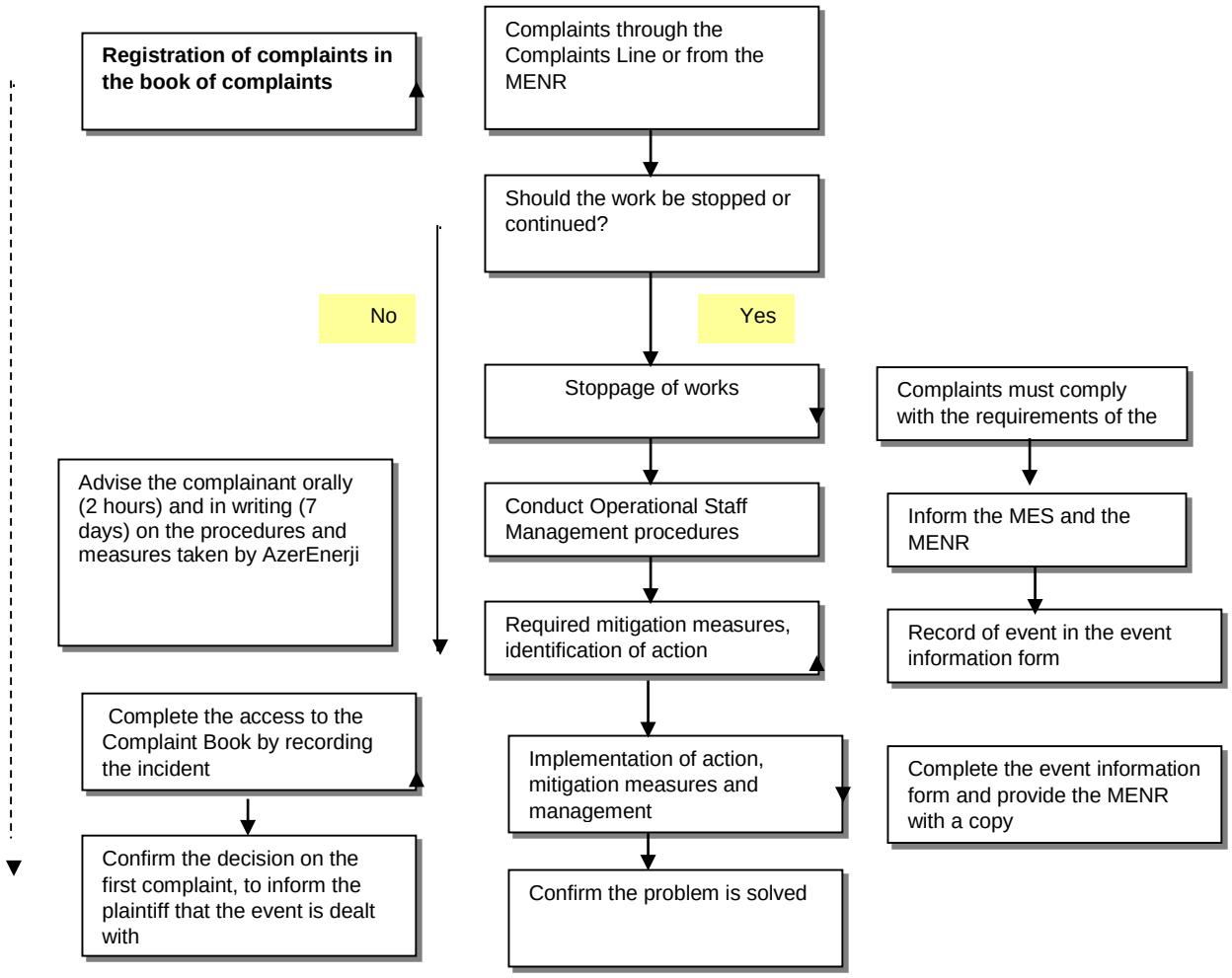


Figure 11.2: Grievance Evaluation Criteria

11.7. Monitoring form

A comprehensive list of environmental issues relevant to the MP shall be compiled. To streamline the monitoring process, a user-friendly monitoring form with checkboxes was developed. This form allows for easy identification of compliance or non-compliance with MP requirements for each environmental issue.

The monitoring form includes a dedicated space for a brief description of any non-compliance observed. Any identified issues will be thoroughly discussed between the contractor and the ES to determine appropriate corrective actions and establish agreed-upon timelines for their implementation. This collaborative approach ensures a prompt and effective response to environmental concerns.

Upon completion, the monitoring form will be signed by all relevant parties, including the contractor, Environmental Coordinator (EC), and EM. A copy of the signed form will be submitted to the Environmental Supervisor (ES) and Supervising Engineer for their records and further action if necessary.

Table 11.2. Sample form for Environmental Monitoring List

Name: Reference: Date:	
Project:	

ENVIRONMENTAL MONITORING LIST (NC = Non-compliance, C = Compliance, NA = Not applicable)					
Index		Score	Index		Score
1.	Access for vehicles and movement of construction machinery		13.	Collection, transportation and storage of construction materials	
2.	Movement of construction staff, workers and equipment		14.	Maintenance and refuelling of construction equipment	
3.	Cleaning of vegetation cover		15.	Solid waste management	
4.	Wildlife protection		16.	Hazardous materials	
5.	Cultural and / or archaeological sites		17.	Floods from the construction camp	
6.	Soil management		18.	Fire	
7.	Erosion control		19.	Atmospheric air and dust	
8.	Slope protection		20.	Noise	
9.	Access roads		21.	Crossings of rivers, streams and marshes	
10.	Excavation, filling and trenching works		22.	Visual	

11.	Smoothing		23	Cleaning and rehabilitation of the area	
12.	Sand extraction				
			A	Other	
Corrective action on non-compliance: (Action and Time Plan)					
Completed: Environmental Monitoring Officer (EMO) (Name and Signature) Date			Response required: Contractor (Name and Signature) Date		
Comments Notes ☐ EMP Manager (ES) ☐ Contractor PM ☐ Supervision Engineer					

12. CONCLUSION AND RECOMMENDATIONS

The ESIA has assessed the magnitude of environmental and social impacts likely to arise as a result of construction and operation of OHLs under the AZURE project. The overall environmental and social (E&S) risk is classified as substantial. Eight of the ten environmental and social standards (ESSs) have been screened as relevant. Standard 7 on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities and Standard 9 on Financial Intermediaries are considered not relevant.

Social and environmental impacts are expected to be substantial, mainly site-specific, largely reversible and addressed through mitigation measures. No physical displacement of PAPs is expected, as the OHLs route will avoid residential areas and will pass mainly through agricultural and grazing lands, state lands, and private lands. Through careful routing, the OHLs will avoid entering the Turyanchay Nature Reserve and Shirvan National Park areas. One OHL will cross a large wetland (Varvara Reservoir near Mingachevir) because the alternative possible alignments would inevitably cross urbanized areas.

The project is assessed to generate some environmental and social issues owing to land access and the spread of transmission corridors. The community had raised concern on issues with regards to health and safety and potential exposure to electromagnetic fields during operation especially during rainy season. Besides, the community also had raised concern for adequate compensation for land use along the tower footprints.

Mitigation measures for potential impacts on air, water, land, soil, noise, ecology and socioeconomic have been specified through

- Follow up of best practice of compensation, public disclosure, grievance management and compensation.
- Planning and designing of tower structure, site preparation and access route, compensation etc.
- Application of standards for Health and safety for construction tower erection and stringing activities

The ESMP provides a delivery mechanism to address potential adverse impacts, to instruct contractors and to introduce standards of good practice to be adopted for project activities taken up during construction and operation phases of the project. Inspection and monitoring of the environmental and social components phase activities will increase the effectiveness of suggested mitigations.

From an environmental perspective, the most significant adverse impact is likely to be collisions by flying birds with the OHLs. The species most likely to be affected are wintering Little Bustards,

large wetland birds, and raptors. The ESIA has identified sensitive segments of the OHLs where specific mitigation measures will be used to minimize bird collisions, along with potential nesting disturbance during OHL construction.

From the social perspective the following aspects have been identified as having potential adverse effects and require mitigation in design, construction or during operation:

- PAPs affected by land acquisition for construction of OHLs

there will be no physical displacement and impact on land will be limited to only 57 households, of which only 4 will be affected by permanent land acquisition (0.084 acres) with impacts to informal user and those affected by the easement to be identified as part of the resettlement planning process. The Project has the potential to have beneficial impacts of improved electricity, improved access roads, potential for employment and business opportunities for the whole community in the affected peoples.

From a social perspective several potential risks have been identified, particularly with respect to community health and safety, including concerns on potential exposure to electromagnetic fields during operation, labor conditions, land acquisition and resettlement, construction disruption and potential damage to cultural heritage, and the biophysical impacts, including disturbance impacts, and impacts to cultural heritage. In addition, information dissemination, stakeholder engagement, and grievance management processes are potential social risks. Temporary influx of external labour, work-site access issues, and restrictions on land use also are also amongst potential social risks. All of the expected social risks will be given considerable attention and high-level management to mitigate any social risks.

At institutional level, it will be important for Azerenerji to develop its environmental and social risk management capacity given the challenges it will face in the land acquisition process. The main recommendation is therefore to engage a competent social risks specialist with experience working with IFIs. Azerenerji shall ensure that any required land acquisition is conducted in line with national laws and the World Bank's Environmental and Social Standards (ESS5) on land acquisition and involuntary resettlement and develop a fair and transparent compensation plan for affected landowners and communities.

13. Public Consultations on disclosure of the Environmental and Social Documents (Scoping Report, Resettlement Policy Framework, Stakeholder Engagement Plan and Labour Management Procedures)

Location: Agsu Region, Bijo village90

Date and time: October 1, 2024, 10:00 AM

Participants: 28 people (representatives of interested parties from Bijo, Langabiz and Gashad villages)

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- A representative of the service organizations.

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji JSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project

90Villagers from the nearby Langabiz and Gashad villages of Agsu Rayon were also invited to the meeting.

and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	**Responses (Azerenerji, PIU)**
– Will people be informed about the project design and construction plan before construction starts?	Ziba Guliyeva – People will be regularly consulted on SEP activities and informed of all upcoming project stages.
–The OHLs will negatively affect the health of the population and the environment due to radiation and effects from electrical energy.	Ilaha Ilyasova – According to national construction standards, the distance to nearby settlements should not be closer than 8-10m, and the height of the 330kV and 500kV transmission lines should be at least 8m to avoid radiation exposure. In fact, all project OHLs avoid settlement areas and the height in Azerbaijan is usually 10 or higher.
– Regarding employment, you mentioned that locals will be given priority for project activities. However, this does not sound very promising as	Ilaha Ilyasova – The contractors will be encouraged to involve the local communities in

Questions	Responses (Azerenerji, PIU)
in other projects carried out in the village area, the contractors usually hire friends and/or relatives or bring in labour from other communities.	the skilled and non-skilled works according to their capacity.
- I am happy to hear about this project, its aims and the benefits it will bring to us all. At the same time, I am concerned and do not believe that all the mitigation measures will be implemented as we have already experienced a similar OHL construction project that destroyed our agricultural lands and access roads. So I personally don't believe that this project will be beneficial to the community.	Ilaha Ilyasova – There will be a different approach to this project. Negative impacts of the project construction works have been studied and all prevention and mitigation measures have been recommended accordingly in the ESIA document. The document will be shared with the project communities. A traffic management plan will be developed, taking into account the access roads to the project, which will be discussed and agreed with the communities and the relevant traffic police. The contractor will be required to ensure that the roads are repaired before leaving the communities. The Supervision Engineer will ensure the implementation of mitigation measures and the Grievance Redress Mechanism will set out the means for addressing your concerns and grievances. Hotlines and contact details of responsible persons will be provided. On completion of construction, project sites and access roads will be rehabilitated and handed over to the owners.
–Please avoid impacting our village and community.	Ilaha Ilyasova As mentioned above, no physical replacement in the residential area of the villages is expected. Temporary impacts will be mitigated by the contractor and implementation will be monitored by the supervising engineer and Azerenerji. Grievance

Questions	Responses (Azerenerji, PIU)
	mechanisms will be in place to address any issues related to the project activities.
– Thank you for this meeting and for the information you have shared with us. All these measures dedicated to preventing various impacts sound good, please make sure that your activities will be consistent with the information you have shared.	Ilaha Ilyasova – As mentioned above, appropriate mechanisms will also be in place to ensure the implementation of the notified measures.

Similar consultations with disclosure of ESF documents were held in the meetings organised for the villagers of Gegeli and Dashdamirbeyli (01 October 2024; 11:00) and Garagoyunlu and Ulguch (01 October 2024; 12:30) of Agsu region. These meetings were attended by representatives of the village municipalities and executive representatives, as well as representatives of the Mingachevir Regional Electricity Network.

The people of Gegeli and Dashdamirbeyli are particularly concerned about the condition of some of the existing OHLs, which have been out of service for a long time and are dangerous. On the other hand, people are still under the negative impression they experienced during the construction of the Oghuz-Qabala Gaz pipeline, when temporary impacts on private properties during the construction works were not rehabilitated, and access roads and landscape of private properties remained destroyed. Poor electricity supply was another challenge for the local population. In turn, the people were again informed about the grievance redressal mechanisms that they can use if they experience any problems related to the project activities and the various stakeholder engagement activities that are being considered for this particular project.

People also mentioned an old, disused OHL that is no longer in use, so they would like the pylons to be removed from their plots, freeing up the land taken and increasing the area of agricultural activity. The people also expressed their wish to move the OHL line up into the mountainous area to avoid any land acquisition / easement.

The villagers of Garagoyunlu and Ulguch village of Agsu region were interested in whether compensation would be paid for the agricultural land affected. In contrast to the Oguz-Qebele pipeline project mentioned above, they would like to see a fair impact assessment and payment.

Representatives from all these villages expressed interest in employment opportunities and people's willingness to work.

Location: Ismayilli Region, Qubakhalilli village

Date and time: October 1, 2024, 15:00

Participants: 38 people (villagers, representatives of interested parties from Gubakhalilli village of Ismayilli region, as well as Garabaggal and Garamaryam villages of Goychay region)

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- Representative of the service organizations.

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji JSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	Responses (Azerenerji, PIU)
– It's been a long time since the water pipes were laid to the village. But we are still suffering from a lack of water supply. We think that a proper electricity supply will hardly reach us either.	Ilaha Ilyasova – As mentioned above, work on the ES impact assessment is ongoing. Construction is expected to start next year.
– Show us the direction of the lines. One of the existing lines goes through my land. I wonder if the new one will also go through my land?	Ilaha Ilyasova – Here is the map, please have a look at the direction of the OHLs. Affected land will be compensated by mutual agreement. Detailed information will be provided once the detailed design and impact assessment is complete.
– Qaramaryam and Qarabaggal are two of the largest villages in Goychay rayon. I believe that this project will benefit the villagers by paying compensation for the affected land and providing employment opportunities to the people. We wish you success and please ensure that people benefit from the project activities.	Ziba Guliyeva – Contractors will be encouraged to involve local communities in skilled and non-skilled work according to their capabilities. Compensation will be paid in accordance with national regulations. During the ongoing stakeholder engagement activities of the project, you will be additionally consulted on these issues.
- It is important to know whether or not the local people are going to be employed. There are some houses where only one person gets a	Ziba Guliyeva – Contractors will be encouraged to involve local communities in skilled and non-skilled work according to their capacity. You will

Questions	Responses (Azerenerji, PIU)
salary or pension, and it is difficult to live, the prices of everything have gone up. For example, the price of internet has gone up from 18 AZN to 25 AZN.	also be consulted on these matters during ongoing stakeholder engagement activities throughout the project cycle.
- My neighbour bought the land and the lines cross her land and it is very dangerous. Putting the lines up in the mountains instead of near the village would be a good approach.	Ilaha Ilyasova – The aim is to avoid residential areas and to stay as far away from private property as possible. All safety measures will be implemented. The Grievance Redress Mechanism (GRM) will be in place to address any issues related to project impacts and concerns.
– When I used to work for a village municipality, people suffered negative impacts from road construction. Temporary impacts on people's private agricultural land due to the location and movement of the contractor's equipment were not mitigated. As we have witnessed this, please ensure that all necessary mitigation measures are implemented in this project. Furthermore, we have witnessed previous projects where affected landowners did not receive compensation for the affected land. Please also ensure that heavy machinery is transported in such a way that it does not temporarily affect private farmland, or provide compensation for the impact.	Ilaha Ilyasova – A traffic management plan will be developed by contractor and agreed with the local authorities. If temporary impacts are unavoidable, compensation will be paid by the Contractor in agreement with the landowner. Mitigation measures will be implemented and their implementation managed by the Contractor's E&S Safeguards Specialists and SE teams. You can also use the grievance redress mechanisms that will be set up and introduced in all the communities through which the OHLs pass to express your concerns and grievances.
– Job opportunities are very important to us. This will also stop the current migration of young people to the nearby big cities and the capital, which most of our young people have to leave to look for work and to leave their families behind.	Ziba Guliyeva – Contractors will be encouraged to involve local communities in skilled and non-skilled work according to their capacity. You will also be consulted on these and other matters during ongoing stakeholder engagement activities throughout the project cycle.

Location: Goychay Region, Arabchabirli 2 village

Date and time: October 1, 2024, 17:00 AM

Participants: 23 people (representatives of interested parties from Arabchabirli 1, Arabchabirli 2 and Mirzahuseyinli villages)

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji OSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the

AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	Responses (Azerenerji, PIU)
– Where will the lines be installed? Will compensation be paid for all private land?	Ilaha Ilyasova - Outside the residential areas of the village, mostly in the agricultural areas. You can take a look at the map. Yes, all affected private property will be compensated.
- Please ensure that the OHL is high enough to allow agricultural machinery to move.	Ilaha Ilyasova – According to the Azerbaijan State Construction Normative, the height of the 330kV OHL is at least 8m, which is sufficient to move the agricultural equipment.
– What are the benefits to our villagers?	Ziba Guliyeva – Short and long term benefits are expected - employment opportunities, local market demand and improved power supply.
- Please reconsider the alignment through our village and move it up the mountain.	Ilaha Ilyasova – The given direction is considered to be the best of the alternatives in terms of minimising environmental and social impacts.

Location: Mingachevir town, Mingachevir REN

Date and time: October 2, 2024, 10:00

Participants: 41 people (representatives of interested parties from Mingachevir town, including people working in Mingachevir REN and from various industries in Mingachevir)

- Executive Power local representative;
- Members of Municipalities;
- A representative of the service organizations.

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji OSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the

AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	Responses (Azerenerji, PIU)
– Thank you for the project and for sharing the information. Usually most people are not aware of the Right of Way (ROW) of the OHL, so whenever we check the OHL we find that people who are allowed to use the land temporarily are using it in their own way, building something, etc. So then we have to raise the issue with the different institutions to solve these problems. Then they start demanding ownership of the land. We start explaining that you have been given temporary access to the land, not for permanent use. So they start fencing the land, selling it, even taking the access roads to the OHL that we left for maintenance. Or they start digging, earthmoving, or as a result of their activities, if there is a fire, the emergency vehicles cannot get there because of the earthmoving and excavation. Someone has leased the land, but the land is not in his name; no documentation was done when the land was leased. When the court examines the case, it finds that the name of the lessee is not registered. It is believed that some houses are being built on the informally occupied land, during the	Ilaha Ilyasova – In assessing the impact of OHL construction, ownership will be investigated accordingly; unauthorised users will only be compensated for crops and trees they have grown; compensation for affected private land parts will be paid to the owners accordingly. Compensation for land within the OHL ROW will not be considered. Full details of the assessment of impacts on all types of land will be shared with communities during the preparation of the RAP. Jabrayil Ahmadov - How many people have applied for jobs at Mingechevir Electricity Network, but can't be employed according to their speciality? Workers are needed to supervise the installation of power lines during operation.

Questions	Responses (Azerenerji, PIU)
construction someone can say that it is his land but he doesn't have a registration document. Please be aware that you can expect this kind of problem. We warn them and if this happens, we are obliged to send letters to various organizations and the police. When the land parcel is considered, all the restrictions, requirements and purpose of the land must be explained to the people. We suggest that all the requirements are explained to the landowners as well as to the relevant municipal and executive authorities and the Department of Cadastral Registry to prevent any further problems. The land must be used in accordance with its purpose. - The positive thing is that the energy sector will become strong, ensuring uninterrupted energy supply and even distribution of energy to the surrounding countries. Furthermore, we believe that employment opportunities are not only considered for the construction period; a new engineering staff of locals and existing new REN staff can be involved in maintenance works for these AZURE project OHLs.	
- We have skilled workers, about 50 people who want to be employed. These people will have opportunities to be employed for this project, not only in Mingachevir but also in other places.	Jabrayil Ahmadov – Contractors will be advised to obtain the list/CVs from Mingechevir HR and recruit people who match the job requirements. This is a good activity and will promote the employment of local people.

Questions	Responses (Azerenerji, PIU)
– It's worrying because the plots are under power lines and when it rains it becomes dangerous and noisy and people are afraid to harvest their crops.	Jabrayil Ahmadov – The people are advised to stay away from the "protection zone" when the OHLs are being built. Most of the similar land parcels are located in the "protection zone", therefore the people face this problem. Some unauthorised constructions built in the ROW of the OHLs may pose risks. The purpose of these land parcels was agricultural land, but people have changed it somehow, so problems arise.
– How will the compensation be paid?	Ilaha Ilyasova – The main objective is not to cross the residential areas. But the towers that will be built in the plots will occupy 64 or smth kvm of the land and these small parts will be taken on the basis of easement. It is not a purchase of the land; it is a lease of the land parcels and the prices will be calculated best on the market value and mutual agreement with the land owners and compensation will be paid. It is currently in the planning stage. Relevant laws will be applied. In the next stage, the RAP will be prepared. PAPs will be identified, impacts assessed and negotiations held with them. Agreements will be reached with landowners.
– Ensure that project equipment does not disrupt urban traffic by properly maintaining the edges of the access roads.	Ilaha Ilyasova - The ESMP will be prepared and the contractor will be required to detail the mitigation measures. The contractor will be allowed to set up a camp, purchase equipment, etc., and will be required to restore the land upon completion of the works. The supervising engineer will monitor the contractor's work.

Questions	Responses (Azerenerji, PIU)
- If necessary, road signs must be erected. Land users must see the signs and understand that they cannot occupy the land within the ROW. Will be good to employ vulnerable people, or from their families.	Ziba Guliyeva - A traffic management plan will be developed and agreed with the local traffic police, communicated to the public and followed up by the contractor; a public awareness campaign will also be carried out during the project cycle.
-My husband works at Azerenerji and he faces problems every day because the landowners don't respect the contract in the protected zone. They go beyond the boundaries of the land and into the ROW. They block the access roads and carry out earthworks that make it very difficult for the engineers to get to the towers.	Ziba Guliyeva – Awareness-raising campaigns will also be carried out in subsequent phases of the project. People will learn about the circumstances of this type of interference.
- The positive impact of the project for us is that employment will improve. Our children with higher education can get jobs here, otherwise they would have to leave the city. There are very few women employed in this office; we propose to employ more women. There are jobs that woman can do in Azerenerji.	Ziba GUliyeva – Contractors will be instructed to hire local people and specialists first. Women will be given priority.
- My daughter has graduated from the Faculty of Transport Operators and she has applied to Azerenerji as she is very keen to work in the energy sector.	Ziba GUliyeva – Contractors will be instructed to hire local people and specialists first. AZURE project will impose employment of highly qualified engineers at REN all over Azerbaijan for a long term, so your daughter can take this opportunity and apply.
- I have been working in Mingachevir REN for 42 years, but my contract has been cancelled, now I am working in DOST and I wish to be back to Mingachevir REN.	Ilaha Ilyasova – The AZURE project will also create a demand for certified specialists for the construction and operation phases, including engineers. You can also apply and we wish you all the best!

Questions	Responses (Azerenerji, PIU)
– Whatever the challenges for women working in the energy sector, we accept the difficulties.	Ilaha Ilyasova – Very good to hear that.

Location: Yevlakh Region, Tanrigulular village

Date and time: October 2, 2024, 12:00 AM

Participants: 35 people (villagers, representatives of interested parties from Tanrigulular, Boshchali and Huruushaghi villages of Yevlakh region), also

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- A representative of the service organizations.

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji OSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the

AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	Responses (Azerenerji, PIU)
– I have an old sick mother. I would like to have a hospital in this village so that the ambulance can get here on time. There are not many jobs here, and we also need job opportunities.	Jabrail Ahmadov – Yes, there will be such opportunities, for local skilled and unskilled workers. There will also be economic benefits, the demand for agricultural products will increase.
- We have 5 OHL destroyed near our village residential area, on the road, very dangerous, please help.	Ilaha Ilyasova – We have representatives from the Regional Electricity Network here, they have recorded this. We will also pass this on to management.
– The towers have been installed in my garden and there is rubbish around them. I ask for cleaning. I wouldn't want the OHL to go through my plot if it were up to me. But I would like to know if our thoughts will be taken into consideration or if the OHL will be built anyway.	Ilaha Ilyasova – All mitigation measures will be considered for this project. Waste management plan will be in place along with the other supplementary plans and monitoring activities will be undertaken. Grievance Redress Mechanisms will be presented for any issue arising from the project activities to be addressed. The supervising engineer will monitor the contractor's fulfilment of the ESMP. We will reflect your concerns in the report, please also be informed that the current alignment has been selected among other possible alternatives for having the least impact on people and environment.
- We are happy with the project, but what are you going to do with the old 110kV lines?	Jabrail Ahmadov – The old ones will either be replaced and/or renewed accordingly. The local

Questions	Responses (Azerenerji, PIU)
Sometimes the OHL leave their equipment on our land. Please make sure they are removed. Will you compensate the affected land?	REN may leave the equipment within its ROW. Impacts will be compensated accordingly.
– Will we be informed before the project starts?	Ziba Guliyeva – Yes, communities will already be aware of the impact assessment process and will also be involved in the preparation of the RAP.
- We had a similar situation. The contractor left the camp area after the road construction project without prior rehabilitation and waste. What if the same happens in this project?	Ilaha Ilyasova - Your area will be properly cleaned at the end of construction in accordance with the ESMP. At the same time, grievance redressal mechanisms will be in place so that you can always raise your concerns if anything happens.
– I wish there would be a job opportunity for my son.	Ziba Guliyeva – The communities will be informed of the construction work, and we will also recommend that the contractor employs local people first.

Similar consultations with the disclosure of ESF documents were held at the meetings organised for the villagers of Havarli, Hajiselli and Salahly villages in Yevlakh region (2 October 2024; 13.30). The people asked whether they would receive compensation for the damaged agricultural land. They also demanded that the local village authorities be informed about the construction schedule of the project activities. They also demanded that construction impact mitigation measures be ensured. On the other hand, the locals expressed their willingness to give up the agricultural land in exchange for compensation. They said that the land they cultivate is not of good quality and requires a lot of effort. People expressed their understanding that the government's main resources and efforts are currently focused on improving the liberated rayons of Garabagh. Women expressed their satisfaction with the good supply of electricity, water and gas. As these villages are close to Mingachevir town, they have good utilities, access to Mingachevir market and hoped to be able to work for this project, cooking, cleaning, office work, etc.

Location: Agdash Region, Yukhari Agchayazi village

Date and time: October 2, 2024, 16:00

Participants: 26 people (villagers, representatives of interested parties from Hushun, Yekhari Agcayazi, Goshagovag and Arabochagi villages of Agdash Region), also

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- Representative of the service organizations.

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji OSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the

AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	Responses (Azerenerji, PIU)
– The project crosses from the non-irrigated land, the land of the village borders with the state land area. 99 ha is the grazing land. The grazing land will be trampled and wasted, and there will be a need for the road. – If the project crosses the land parcels, will the land owners be compensated? And how will this be done? – Are you considering a road to take livestock to the pastures? There must be an alternative road to take the livestock to the pasture.	Ilaha Ilyasova - If the tower is erected on the land parcels, these land parcels will be leased for a long period of time and compensation will be paid based on market prices. -If the contractor is going to use someone's land as a road, etc., he can negotiate individually with the landowner and come to an agreement on the temporary use of the person's land for designated purposes and the corresponding compensation. Upon completion of the works, the contractors shall rehabilitate the temporarily taken land before handing it over to the owners.
The people are not happy with the way the OHL is going to pass on the plots of land. The land is non-irrigatedland and wheat can't be grown in the summer. There is also a Turyanchay reserve. People can only plant wheat in autumn. Most of this land is like a desert. If there is a spark from electricity, there will be a fire in the land.	Ilaha Ilyasova – All possible alternatives to minimise the impact on private property have been considered and this design is the most appropriate. However, we will inform Azerenerji of your proposal. We are aware of the protected area and no impact on the protected areas is expected. Risk prevention measures will be considered during construction and operation. Assessment of affected crops and trees will be carried out in accordance with national legislation, Land Code. PAPs will be aware of

At the bottom of the mountain, there is a government land, we propose to install the OHL in this land. We propose to install the OHLs in the upper places to reduce the risks. In the Gabala Water Project, 5 AZN was paid for one tree and this is not beneficial for the landowners. The current market price should be used to calculate compensation.	their entitlements and how the calculation of each impacted item is to be carried out.
–We suggest that the heavy machinery should not use the paved village roads. There is a possibility of an alternative road. The bridges are already in poor condition. We propose alternative routes to be discussed and agreed with the communities and executive authorities.	Ilaha Ilyasova – There will be a traffic management plan and the roads will be agreed with the local authorities and the police. It is important to inform the people, what their expectations are, what we mean by mitigation measures, etc. The works are planned for March-April next year. The lines will be checked against the cadastral map, they will be far from residential areas and the plots will be identified. We will also include your suggestions in the report.
— We are afraid of radiation. My neighbour got married and lived in Gabala, but now she has moved to Agdash because she is afraid of the radiation in Gabala.	Ilaha Ilyasova – Residential areas will be avoided and the OHL will be built on agricultural land, taking into account the relevant standards.
You mentioned that chemicals will be used, will they affect our fruit etc? We would also like to see local people being employed.	Ilaha Ilyasova – Concentrated hazardous chemical waste will accordingly be removed from the restricted area to a specially designated site for proper utilisation. A waste management plan will address these issues. No impact on orchards is expected.

Which neighbouring villages will be affected by the project?	Ziba Guliyeva – Locals are given priority in employment according to their experience. You can have a look at the map. The villages of Hushun, Yukhari Agchayazi, Qoshaqovaq and Arabochagi in Agdash are crossed by the project's OHLs.
–We are not happy with the compensation we have received from other projects, for example for trees. Compensation is too low, so please consider market prices. Everyone is now informed about the project and I ask you all (appeal to the villagers) to spread the information in your communities so that everyone has information about the project. You can also give your suggestions.	Ilaha Ilyasova – Compensation valuation methods will be disclosed to the PAP during the preparation of the RAP.
- Please bear in mind that we only have new paved roads, so take this into account when preparing the traffic plan. Please check with the local community or executive representatives as we do not want any impact on our village roads.	Ziba Guliyeva – A traffic management plan will be agreed with the local traffic police prior to construction. The local authority will be informed.

Location: Hajigabul Region, Navahi Settlement

Date and time: September 30, 2024, 11:00

Participants: 24 people (villagers, representatives of interested parties from Ranjbar, Gizilburun, Pirsaat and Atbulag villages of Hajigabul Region), also

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- Representative of the service organizations.

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji OSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the

AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	Responses (Azerenerji, PIU)
-We do not think we will have difficulties with this project; we wish the project will bring benefits to the people. We hope that the road infrastructure in our settlement will be improved. However, we are afraid that from the negative perspective of the panels and the stations, the rain will stop. -We want to be protected from radiation if such an effect is expected.	Ilaha Ilyasova - Only a Navahi substation will be built, no panels. No impact on rainfall is expected. Details will be provided during the disclosure of the ESIA document, which is currently being finalised. No radiation release is expected.
– What will happen to agricultural land affected by the project?	Ilaha Ilyasova If the tower is erected on the land parcels, these land parcels will be leased for a long period of time and compensation will be paid based on market prices.
– The station will be located at the old place related to the Azerenerji. -Maybe you can also open a sewing factory so that women can also be involved to any work outside as long as the station will only involve men work.	Ilaha Ilyasova – Why only men? Women can also be employed according to their capacities and skills. The operation of the new substation will require a variety of skills. In addition, during the construction phase, local women can also apply for work according to their skills and abilities, as the contractor will already be recommended to give preference to the local population. You can also contribute your

	agricultural products and food. Please be active in these processes as well. Consultations with local people will also be carried out throughout the project cycle.
– We are concerned regarding poor road conditions.	Ilaha Ilyasova- There will be a traffic management plan and access roads will be agreed with the local authorities and the police.

Location: Shamakhi Region, Ovchulu village

Date and time: September 30, 2024, 16:00

Participants: 30 people (villagers, representatives of interested parties from Ovchulu village of Shamaki Region), also

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- Representative of the service organizations.

Minutes of the meeting

Cabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the supply and installation of equipment for the 500 and 10 kV parts of the Navahi substation (2x 500 MVA); (ii) expansion of 500 kV bays at Absheron and Azerbaijan TPP substations; and (iii) expansion of 330 kV bays at Mingachevir HPP, Gobu PP and Alat substations.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji OSC) presented the ESF documents to the communities of the region and explained that the draft Environmental and Social Framework (ESF) documents describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan.

The scope and main environmental and socio-economic aspects of the Scoping Report to be further developed in the ESIA were communicated to the people; the institutional framework within the RPF for handling all land acquisition and socio-economic impacts was presented to the communities along with the RAP activities to be further carried out by the consultant.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the SEP and LMP documents and mentioned the importance of stakeholder engagement in the implementation of infrastructure projects, described the stakeholder engagement process in the

AZURE project, as well as the main provisions of labour management, including grievance redress mechanisms.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

Questions	Responses (Azerenerji, PIU)
-Private parcels and agricultural land are our concern. Will impacts on parcels be compensated? -We do not see the impact on farmland as negative, as long as it is compensated. We need our people to be employed. In some of the previous projects, technical specifications, such as the appropriate height of the towers, were not considered, which caused problems for the transport of agricultural equipment. Please ensure that this is taken into account this time. -Please avoid settlements as much as possible for safety reasons. Please do not adversely affect agricultural land. -One of the foreseen impacts is the inability to use agricultural equipment due to the very low height of the OHL. This is an issue, so please consider this in your project.	Ilaha Ilyasova - The main objective is not to cross the residential areas. But the towers that will be built in the plots will occupy minimum land and these small parts will be taken on the basis of easement. It is not a purchase of the land; it is a lease of the land parcels and the prices will be calculated best on the market value and mutual agreement with the land owners and compensation will be paid. It is currently in the planning stage. Relevant laws will be applied. In the next stage, the RAP will be prepared. PAPs will be identified, impacts assessed and negotiations held with them. Agreements will be reached with landowners.
-During the construction of OHL, please consider the height of agricultural equipment. In the past we have been faced with the	Ilaha Ilyasova- According to national construction standards, the distance to nearby settlements should not be closer than 8-10m, and the height of the 330kV and 500kV transmission lines should be at least 8m to

destruction of land and no rehabilitation at the end of the project. Please ensure that this will not be a case in this project. -In case if you divide the parcel into some parts this will not be possible to use it because to heavy equipment destroys the access municipal roads and agricultural land. -The remaining land under the lines will also be affected if restrictions are required for undertaking agricultural activities.	avoid radiation exposure. In fact, all project OHLs avoid settlement areas and the height in Azerbaijan is usually 8 or higher.
-Ensure that the area is restored to its pre-project condition.	Ziba Guliyeva -There will be a traffic management plan and the roads will be agreed with the local authorities and the police.
-We need to employ our local people in skilled and unskilled jobs. -It would be great if this project could provide long-term employment opportunities, such as the construction of a large power station and its subsequent operation.	Ziba Guliyeva – Contractors will be instructed to hire local people and specialists first.

Similar consultations with the disclosure of ESF documents were held at the meeting organised for the Goyler Chol village in Shamakhi region (30 September 2024; 15.00). The people were concerned on the height of the towers, mentioning that they would like to avoid the OHLs interfering the movement of the agricultural vehicles. They thought that 50-60% of their land parcels could be affected, and were interested how the compensation will be paid. The people asked whether they would receive compensation for the damaged agricultural land. They also demanded that the roads to be rehabilitated upon completion of works. They requested the local people to be hired by the project. Also, they were concerned that the access roads to private land parcels could be destroyed by project activities, and requested to take all impacts into consideration to not disturb community activities.

14. Public Consultations on disclosure of the Environmental and Social Impact Assessment Report and ESIA Non-Technical Summary

Location: Hajigabul Region, Navahi Settlement

Date and time: February 5, 2025, 15:00 AM

Participants: 19 people (representatives of interested parties from Hajigabul, Aghsu,and Shamakhi regions)

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- A representative of the service organizations.

Minutes of the meeting

Jabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the construction of a 330 kV transmission connection to evacuate power from the 240 MWac Absheron WPower Plant (WPP), and (ii) the 500 kV upgrade of Navahi Substation and related infrastructure for the reliable N-1 evacuation of 1 GW of variable renewable energy connected to the Navahi substation and the enhanced fluctuation management of 1.8 GW of VRE capacity in the system to ensure grid stability.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji JSC) presented the Environmental and Social Impact Assessment Report to the communities of the regions and explained that the draft ESIA describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan. The scope and main environmental and socio-economic aspects of the ESIA, components of environmental and social impact assessment, potential environmental and social

impacts and mitigation measures, labor and working conditions, measures during emergency cases, ornithological studies and conservation of biodiversity, environmental and social management plans and monitoring plans were communicated to the people.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the ESIA Non-Technical Summary document summarizing the scope and purpose of the ESIA, regulatory framework, the stakeholder engagement and public consultation processes and their importance in the AZURE project, the main provisions of grievance redress mechanisms, and who to contact for information including grievances.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.
The participants are particularly interested about the electricity tariffs after implementation of the project, and whether the tariffs will be decreased. The village representatives are also concerned about the sites for construction of OHLs.

Questions	Responses (Azerenerji, PIU)
-Will we have discounts on the electricity tariff?	Jabrail Ahmadov – This will probably be further considered by the government, but we cannot say anything certain within the framework of this project.
- Where will the lines be installed?	Ilaha Ilyasova – The OHL construction will be conducted outside the residential areas of the village, mostly in the agricultural areas. You can take a look at the map.

Location: Goychay region, Arabjabirli 2 village

Date and time: February 6, 2025, 12:00

Participants: 18 people (villagers, representatives of interested parties from Ismayilli region, and Agdash regions)

- Executive Power local representative;
- Members of Municipalities;
- Village residents; and
- Representative of the service organizations.

Minutes of the meeting

Jabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the construction of a 330 kV transmission connection to evacuate power from the 240 MWac Absheron WPower Plant (WPP), and (ii) the 500 kV upgrade of Navahi Substation and related infrastructure for the reliable N-1 evacuation of 1 GW of variable renewable energy connected to the Navahi substation and the enhanced fluctuation management of 1.8 GW of VRE capacity in the system to ensure grid stability.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji JSC) presented the Environmental and Social Impact Assessment Report to the communities of the regions and explained that the draft ESIA describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan. The scope and main environmental and socio-economic aspects of the ESIA, components of environmental and social impact assessment, potential environmental and social impacts and mitigation measures, labor and working conditions, measures during emergency cases, ornithological studies and conservation of biodiversity, environmental and social management plans and monitoring plans were communicated to the people.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the ESIA Non-Technical Summary document summarizing the scope and purpose of the ESIA, regulatory framework, the stakeholder engagement and public consultation processes and their importance in the AZURE project, the main provisions of grievance redress mechanisms, and who to contact for information including grievances.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.
To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

The participants are particularly interested about the usage of the energy generated by this project, concerned about the noise impact during the transport of aggregates and construction work.

Questions	Responses (Azerenerji, PIU)
-Can we generate energy individually by installing panels? Can I sell the energy to make a profit?	Jabrayil Ahmadov – At present, legislation is considering the issue of individual generation of electricity. But the issue of selling it will be considered after 2027. So, the ones who generates can use it.
-Will we use the energy generated by this project?	Ilaha Ilyasova – The energy generated by this project will be transferred to the National Grid. This will certainly improve the sustainability of your energy.
-What happens if people are psychologically affected by noise during the transport of aggregates and construction work?	Ziba Guliyeva- No work will be carried out in residential areas. In addition, as we mentioned, the necessary measures will be taken to prevent noise impact on residents. Standards will be followed. Grievance mechanisms will be established and communicated to the community to address any concerns.

Location: Mingachevir town, Mingachevir REN

Date and time: February 7, 2025, 11:00

Participants: 50 people (representatives of interested parties from Mingachevir town, including people working in Mingachevir REN and from various industries in Mingachevir, and representatives from Yevlakh region)

- Executive Power local representative;
- Members of Municipalities;
- A representative of the service organizations.

Minutes of the meeting

Jabrayil Ahmadov (Legal Advisor, Legal Division under the Human Resources and Services Department of Azerenerji JSC) informed the audience that the GoA, through Azerenerji, the State Enterprise for Electricity Generation and Transmission, has planned the grid readiness for the integration of 1 GW of solar and wind energy by 2027. The participants were informed that the project will be jointly financed by the GoA and the WB, with the GoA financing the construction of the 330 kV part of the 500/330/10 kV Navahi substation, the connection of the Bilasuvar and Banka solar power plants to the Navahi substation with 330 kV lines, and to the Absheron substation with a 500 kV line temporarily operating at 330 kV, while the WB will finance (i) the construction of a 330 kV transmission connection to evacuate power from the 240 MWac Absheron WPower Plant (WPP), and (ii) the 500 kV upgrade of Navahi Substation and related infrastructure for the reliable N-1 evacuation of 1 GW of variable renewable energy connected to the Navahi substation and the enhanced fluctuation management of 1.8 GW of VRE capacity in the system to ensure grid stability.

Ilaha Ilyasova (Environmental and Social Safeguards Coordinator of the PIU, Azerenerji JSC) presented the Environmental and Social Impact Assessment Report to the communities of the regions and explained that the draft ESIA describe the potential socio-environmental impacts and mitigation measures that have been prepared as part of the project and in accordance with the World Bank's Environmental and Social Standards and the relevant legislation of the Republic of Azerbaijan. The scope and main environmental and socio-economic aspects of the ESIA, components of environmental and social impact assessment, potential environmental and social impacts and mitigation measures, labor and working conditions, measures during emergency

cases, ornithological studies and conservation of biodiversity, environmental and social management plans and monitoring plans were communicated to the people.

Ziba Guliyeva (Stakeholder Engagement Specialist of PIU, Azerenerji JSC) presented the ESIA Non-Technical Summary document summarizing the scope and purpose of the ESIA, regulatory framework, the stakeholder engagement and public consultation processes and their importance in the AZURE project, the main provisions of grievance redress mechanisms, and who to contact for information including grievances.

Communities were informed that these documents were now open to the public for questions and comments. It was also mentioned that the full electronic versions of the documents were available on the official Azerenerji website.

To facilitate the observation of the OHL alignment and the dissemination of information, the participants were provided with village-level maps showing the direction of the OHLs through their villages. The meeting continued with a question and answer session.

The participants are particularly interested about the compensation for the affected land, and importance of informing the landowners and other stakeholders from various state authorities to prevent any potential problems.

Questions	Responses (Azerenerji, PIU)
-Will compensation be paid for all private land?	Ilaha Ilyasova –Compensation will be paid in accordance with national regulations. During the ongoing stakeholder engagement activities of the project, you will be additionally consulted on these issues.
-When the land parcel is considered, all the restrictions, requirements and purpose of the land must be explained to the people. We suggest that all the requirements are explained to the landowners as well as to the relevant municipal and executive authorities and the Department of Cadastral Registry to prevent any further problems.	Ziba Guliyeva– Within the Stakeholder Engagement process, all the stakeholders, landowners and relevant ministries are being consulted, and this will continue during construction and operation.

Appendix #1.

ESIA Report and ESIA Non-Technical Summary documents published on the official website in January 31, 2025. **https://www.azerenerji.gov.az/azureproject**

BIBLIOGRAPHY

A. General sources

Azerbaijan Scaling-Up Renewable Energy Project. Environmental and Social Scoping Report. June, 2024

AzerEnerji Strategic Development Program for 2024-2034

IFC Performance Standards on Environmental and Social Sustainability. January 1, 2012

World Bank Environmental and Social Framework (ESF): World Bank Group, 2016

Environmental and Social Impact Assessment (ESIA) Guidelines: International Finance Corporation (IFC), 2012

B. Geology

Construction norms of the Azerbaijan Republic. Construction in seismic districts. AzDTN2.3-1. State Committee for Urban Planning and Architecture of the Republic of Azerbaijan – Baku 2010 (in Azeri)

Geographic Atlas of Azerbaijan Republic. Baku, 2018

Geological Map of the Republic of Azerbaijan. 1: 500,000. Baku Cartography Factory. 2009 (in Azeri)

Geology of Azerbaijan, Volume III. Baku, "Elm" publishing house, 2015. 382 p. (in Azeri)

http://www.seismology.az/az/#.WnhtwaiWaUk

Imanov F.A., Alekberov A.B. Modern Changes in Water Resources of Azerbaijan and their Integrated Management. Baku - Mutarcim – 2017 (in Azeri)

Management Plan of the Kur River Basin of Azerbaijan. EU Project “Environmental Protection of International River Basins”. MENR. 2015

C. Meteorology and Climate

Climate of Azerbaijan (Published by Madatzadeh A.A., Shikhlinskogo E.M). Baku, Edition- AN Az. USSR, 1968, 340 vol.

Ecological Atlas. Climate Map. Baku 2009

Environmental Protection of International River Basins Project Contract No. 2011/279-666. 3rd Pilot Project Concept - Implementation of EU Flood Directive in Zayamchay River sub-basin

(Central Kura Basin District, Azerbaijan). Preliminary flood assessment in Zayamchay river sub-basin. Report. Baku. 2016

EU's drinking water standards. Council Directive 98/83/EC on the quality of water intended for human consumption. Adopted by the Council, on 3 November 1998

Magbet Mammadov. Azerbaijan Hydrography. Baku. 2002 (in Azeri)

Multi-year Data on Surface Water Regime of the Land. Volume VII. Azerbaijan SSR. Leningrad, 1987 (in Russian)

Rustamov S.G., Gashgai R.M. Water Resources of Azerbaijan SSR. Baku, 1982 (in Russian)

Surface Water Resources of USSR: Volume 9: Transcaucasia and Dagestan: Issue 1. Western Transcaucasia. Leningrad. 1969 (in Russian)

UNEP.Global Drinking Water Quality Index Development and Sensitivity Analysis Report

Water Resources of Transcaucasia (edited by G.G. Svanidze). Leningrad: “Gidrometizdat”, 1988 (in Russian)

D. Soils

Ecological Atlas of the Republic of Azerbaijan. Baku. 2009

Environmental Assessment Map of Azerbaijani Soils.1:600 000 Baku. 2002

Esdat Environmental Database Management Software. Soil Remediation Circular 2009. Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act Ministry of the Environment. July 27, 2009

Guliyev I.A.. General soil science and soil geography. Baku 2014 (in Azeri)

Mamedov R.G. Agrophysical properties of soils of Azerbaijan SSR. Baku, Elm, 1988 (in Azeri)

Mammadov Garib. Essentials of Soil Science and Soil Geography. Baku, «Elm», 2007 (in Azeri)

Salayev M.E., Aliyev H.A.. Diagnostics and classification of Azerbaijani lands. Baku, 1991 (in Russian)

Soil map of Azerbaijan. 1:600 000. Baku. 1990

Volobuyev V.R. Ecological and genetic analysis of soil cover of Azerbaijan. Baku, Pub. House AS of Az.SSR, 1962 (in Russian)

E. Biodiversity

Azərbaycanın heyvanlar aləmi. Onurğalılar, III cild. Bakı: Elm, 2004, s. 620.

Azərbaycan Respublikasının Qırmızı Kitabı. Fauna, II nəşr. Bakı, 2013, s. 517.

Azərbaycan Respublikasının Qırmızı Kitabı. Nadir və nəsli kəsilməkdə olan fauna növləri. III nəşr. İmak mətbəəsi, Bakı, 2023, 282 səh.

Biodiversity and Ecosystem Services in Impact Assessment: International Association for Impact Assessment (IAIA), 2018. This document outlines best practices for assessing and mitigating impacts on biodiversity and ecosystem services

Əbdürrəhmanov Y.Ə. Azərbaycan faunası. Balıqlar. Bakı:Azərb. SSREA, 1966, 223 s.

Həsənov N.Ə., Raxmatulina И.К. Abşeron-Qobustanın teriofaunasına dair. Azərbaycan Milli EA-nın Xəbərləri, Biol. elm. ser, 2004, № 1-2, s. 95-107.

Quliyev S.M. Azərbaycanın cütdırnaqlılar faunası, Bakı, 2008, 224 s.

Mustafayev Q.T. Azərbaycan ornitofaunasının taksonomik spektri. “Bakı Universiteti” nəşriyyatı, Bakı, 2004, 35 səh.

Алекперов А.М. Земноводные и пресмыкающиеся Азербайджана. Изд-во «Элм», 1978, 264 стр.

Верещагин К.Н. Млекопитающие Кавказа. История формирования фауны, М- Л: Изд-во МГУ, 1959, 703 с.

Рахматулина И.К. Рукокрылые Азербайджана (фауна, экология, зоогеография). Баку, 2005, 476 стр.

Lars Svensson, Peter J. Grant, Killian Mullarney, Dan Zetterstrom. 2004. "Bird Guide", Harper Collins Publishers Ltd, Trento-Graphicom, Vicenza, Italy, 400 pages.

Patrikeev M. Birds of Azerbaijan. Publisher: Pensoft Pub (1807), 2004. 380 p.

Schmidt S., Gauger K., Agayeva N. Birwatching in Azerbaijan: A guide to nature and landscape, 2008, 224 p.

USAID, Biodiversity Analysis Update for Azerbaijan, 2010

William J. Sutherland. 1996. "Ecological Census Techniques (a handbook)". Cambridge University Press, UK, 320 pages.

F. Landscapes

Guidelines for Landscape and Visual Impact Assessment. Second edition. Landscape Institute & Institute of Environmental Management and Assessment. Taylor and Francis e-Library, 2005

G. Air Quality, Noise and Vibration

Maximum permitted turbidity limits of poisonous elements at workplace GOST 12.1.005-88; Azerbaijan MENR, 2003

H. GHG Emissions

International Panel for Climate Change (IPCC) Guidelines for National GHG Inventories. 2006

I. Socioeconomic Baseline

Azərbaycan Respublikasının Dövlət Statistika Komitəsi

«2023 Statistical Yearbook of Azerbaijan». Azerbaijan State Statistical Committee. Baku – 2024

Statistical Yearbook “Transport in Azerbaijan”. Baku - 2020

IFC, 2007. Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets. Washington, D.C., USA

IFC, 2012. Performance Standards on Environmental and Social Sustainability. Washington, D.C., USA

International Monetary Fund, World Economic Database

Social Impact Assessment: Integrating Social Issues in Development Projects: Vanclay, F. and Esteves, A.M. (Eds.), 2011

Web Sources

http://www.aera.gov.az/en/legal-acts/laws

http://www.birdlife.org/

http://www.keybiodiversityareas.org/site/mapsearch

http://www.ramsar.org/

http://www.worldwildlife.org/ecoregions

https://data.worldbank.org/country/AZ

https://ibat-alliance.org/visual-data-map

https://issuu.com/zoienvironment/docs/cc-azerbaijan-en

https://minenergy.gov.az/en/dovlet-proqramlari/azerbaycan-respublikasi-regionlarinin-2019-2023- cuillerde-sosial-iqtisadi-inkisafi-dovlet-proqrami

https://unfccc.int/resource/docs/natc/azenc3.pdf

https://weatherspark.com/y/104854/Average-Weather-in-Qobustan-Azerbaijan-Year-Round
https://www.adb.org/documents/safeguard-policy-statement

www.equator-principles.com

https://www.ebrd.com/news/publications/policies/environmental-and-social-policy-esp.html

https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:102556

https://www.iucn.org/theme/protected-area

https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/qobustan_azerbaijan_585223

https://www.nature.scot/handbook-environmental-impact-assessment-guidance-competentauthorities-consultees-and-other

https://www.ohchr.org/Documents/Issues/ClimateChange/Impact/Azerbaijan.pdf

https://www.protectedplanet.net/country/AZ

https://www.stat.gov.az/

https://www.stat.gov.az/source/environment/?lang=en

www.iucnredlist.org

https://lcviewer.vito.be/2019/Azerbaijan

15. ANNEXES