Initial Environmental Examination

Project Number: 42408
March 2013

Republic of Azerbaijan: Water Supply and Sanitation Investment Program – Aghjabedi Town Sewerage Subproject (Tranche 3)

Prepared by AzerSu, Government of Republic of Azerbaijan for the Asian Development Bank.

CURRENCY EQUIVALENTS
(as of 1 April 2013)

Currency Unit	=	Azeri Manat (AZN)
AZN1.00	=	US $ 1.16
US $1.00	=	AZN 0.86

ABBREVIATIONS

ADB	−	Asian Development Bank
WSS	−	Water Supply & Sanitation
MFF	−	Mult-tranche Financing Facility
AzerSu	−	AZERSU Joint Stock Company
SAWMA	−	State Amelioration and Water Management Agency
EA	−	Executing Agency
EAC	−	Expert Appraisal Committee
EARF	−	Environmental Assessment & Review Framework
EIA	−	Environmental Impact Assessment
EMP	−	Environmental Management Plan
PMF	−	Program Management Facility
RA	−	The Republic of Azerbaijan
MENR	−	Ministry of Environment and Natural Resources
MSL	−	Mean Sea Level
WWTP	−	Wastewater Treatment Plant
IA	−	Implementing Agency
IEE	−	Initial Environmental Examination
SAIC	−	State Amelioration and Irrigation Committee
RF	−	Resettlement Framework
PVC	−	Polyvinyl Chloride
HDPE	−	High Density Poly Ethylene
EMP	−	Environmental Management Plan
JSC	−	Joint Stock Company
M&E	−	Monitoring and Evaluation
SES	−	Sanitary Epidemiology Service, Ministry of Health

NOTES

(i) The fiscal year (FY) of the Government of Azerbaijan ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2008 ends on 31 December 2008.

(ii) In this report, "$" refers to US dollars

CONTENTS

Appendix

I. EXECUTIVE SUMMARY

1. The Asian Development Bank (ADB) funded Azerbaijan Water Supply and Sanitation Investment Program is intended to optimize social and economic development in selected secondary towns through improved water and sanitation (WSS) services. This Investment Program is in continuation to the ongoing ADB assistance in WSS Sector (Loan 2119 - Azerbaijan Water and Sanitation Improvement Project), and will cover: (i) WSS infrastructure development in the towns of Agdash, Goychay, Nakhchivan, Aghjabedi, Beylagan, Balakan and other developing urban centers, and the peripheral areas of Baku; (ii) Management Improvement and Capacity Development of WSS agencies; and (iii) a Program Management Facility (PMF) that will oversee the Program development, implementation and management. This will be implemented through multi-trance financing facility of ADB over a period of 8 years (2010-2018). The Azersu Joint Stock Company (AZERSU) is the Executing Agency. PMF, created at AZERSU, is responsible for project implementation, and is supported by international and national consultants. At the field level, a Project Implementation Review Committee will review progress and ensure timely resolution of operational issues.

2. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for Environmental Assessment are described in ADB's Safeguard Policy Statement (2009). This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, loans involving financial intermediaries, and private sector loans. Accordingly, this Initial Environmental Examination (IEE) Report has been prepared for Agjhabedi Town Sewerage Subproject, to be implemented in Tranche 3. Components of this subproject are: (i) sewerage infrastructure - sewer network with manholes and house connections, and (ii) wastewater treatment plant of 20,000 m3 per day capacity. Subproject is currently in bid preparation stage. Construction is likely to start in November 2013 and will be completed in 18 months.

3. The subproject sites are located in existing roads right of way and government-owned lands and are clear of human habitation. There are no protected areas, wetlands, mangroves, or estuaries. Due to careful location of sites, there is no need for land acquisition and relocation of people. Trees, vegetation (mostly shrubs and grasses), and animals in the subproject site are those commonly found in built-up areas.

4. Wastewater Treatment Plant will be constructed on an identified in the northern side of the town. This site is located ideally away from the town, and there is an outlet channel for disposal of treated wastewater safely. WWTP site is privately owned, and AzerSu is currently in the process of acquisition. Resettlement plan, prepared parallel to the IEE, addresses this issue in-line with ADB safeguard policy statement 2009. WWTP will be designed to treat and dispose the wastewater meeting the disposal standards. Necessary provisions for green buffer zone within WWTP premises will be considered in design. Proper selection of treatment process as well as regular O & M of STP mean that the odour will not be a problem. The treated water will be discharged into a channel flowing adjacent to the site. The channel water is used for irrigation. WWTP is designed to meet the disposal standards, so no impact on receiving water body envisaged. Aerobically stabilized sludge will be dewatered directly by using centrifuges (Decanter). Before transported to sludge drying beds, sludge will be conditioned by chemicals (Lime) to prevent odor problem and expressly improve its dewatering characteristics. Dewatered sludge from sludge drying beds will be transported to sludge disposal site adjacent to the WWTP.

5. Regardless of these various actions in locating and designing infrastructure during the IEE process, there will still be impacts on the environment when the infrastructure is built and when it is operating. This is mainly because of the invasive nature of trenching; and because the pipe/sewer network is located in an inhabited town where there are densely populated areas. Because of these factors the considerable impacts are on the physical and human environment.

6. During the construction phase, impacts mainly arise from the need to dispose of large quantities of waste soil and import a similar amount of sand to support the pipes in the trenches; from disposal of water collected in trenched while their being dug; and from the nuisance to/disturbance of residents, businesses and traffic by the construction work. These are common impacts of construction in urban areas, and there are well developed methods for their mitigation. These include: (i) finding beneficial uses for waste material; (ii) safe disposal of water from trenches in a temporary pond and allowing only clarified water into drainage channels; (iii) covering soil and sand during transportation and when stored on site; (iv) planning work to minimize disruption of traffic and communities; and (v) Providing temporary structures to maintain access across trenches where required.

7. Once the system is operating, most facilities will operate with routine maintenance, which should not affect the environment. Leaks in the network will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. Regular monitoring will be conducted at WWTP to ensure that the treated water meets standards. Sludge will be dewatered using decanter, and further dried in sludge drying beds and finally disposed in the identified sludge disposal site, near the WWTP. There is occupational health and safety risk involved while working in WWTP; all the necessary precautionary measures are included. Adequate manpower, operation and maintenance equipment will be provided. Necessary training will also be provided to the personnel.

8. The major impacts of the implementation of this subproject will be beneficial to the citizens of Aghjabedi as it will provide safe sewage disposal, which will serve a greater proportion of the population. This will improve the quality of life of people as well as benefiting both individual and public health as the improvements in hygiene should reduce the incidence of disease associated with poor sanitation. This should lead to economic gains as people will be away from work less and will spend less on healthcare, so their incomes should increase.

9. An Environmental Management Plan (EMP) is proposed as part of this IEE which includes (i) mitigation measures for significant environmental impacts during implementation, (ii) environmental monitoring program, and the responsible entities for mitigation, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) grievance redress mechanism. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. A number of impacts and their significance have already been reduced by amending the designs. Mitigation will be assured by a program of environmental monitoring to be conducted during construction stages. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for remedial action will be reported to the ADB.

10. The stakeholders were involved in developing the IEE through discussions on site and public consultation after which views expressed were incorporated into the IEE and the planning and development of the project. The IEE is made available at public locations and will be disclosed to a wider audience via the ADB website. The consultation process will be continued

and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

11. Therefore, the components proposed under this sewerage subproject in Aghjabedi are unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction, and operation can be mitigated to standard levels without much difficulty through proper engineering design and the incorporation/application of recommended mitigation measures and procedures. Based on the findings of the IEE, the classification of the Project as Category “B” is confirmed, and no further study or detailed EIA is required to comply with ADB SPS (2009). As per the Law of Environmental Protection 1999, an EIA study and approval from MNER is necessary for this subproject. AzerSu is in the process of obtaining this mandatory approval from MNER.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Azerbaijan Environmental Regulatory Framework

12. **Constitutional Provisions**. The constitution of the Republic of Azerbaijan embodies precepts and principles for environmental protection, ownership of natural resources and preservation of cultural heritage. Article 14 of Chapter III (Basic rights and liberties of a person and citizen) entails the state ownership of natural resources, without prejudice to rights and interests of any persons and legal entities. Article 39 constitutes the right to live in a healthy environment, to gain information about true ecological situation and to get compensation for damage done to his/her health and property because of violation of ecological requirements. Article 40 states the rights to practice and participate in culture and protection of historical, cultural, and spiritual inheritance and memorials. In Chapter IV (Main responsibilities of citizens), Article 77 states the responsibilities for protection of historical and cultural memorials; while Article 78 stipulates the citizen's responsibility for protection of environment.

13. Drawing from the constitutional provisions, the Government of Azerbaijan enacted various legal instruments – Parliamentary legislations that defines and establishes the State regulation of protected natural areas, and the protection and use of the environment and biodiversity; Presidential Decrees and orders, the Cabinet of Ministers resolutions, and By-laws of the executive authorities (Ministries and Committees).

14. **Laws**. The Laws/Regulations currently in force in Azerbaijan that deal with environmental protection are listed below:

(i) Environmental Protection and Utilization of Natural Resources (1992)
(ii) Environmental Protection (1999)
(iii) State Ecological Expertise (1996)
(iv) Environmental Safety (1999)
(v) Water Code of the Azerbaijan Republic (1998)
(vi) Water Supply and Wastewater (2000)
(vii) Health Protection (1999)
(viii) Sanitary-Hygienic State (1992), part of GOST
(ix) Water quality, air and noise standards: GOST (various years)
(x) Program on Strengthening Financial Discipline in the Water Sector (2002)
(xi) Improvement of Water Supply Management (2004)
(xii) Construction Norms and Regulations: SNiP
(xiii) Rule for Use, Protection and Preservation of Trees and Bushes (No 173; September, 2005)
(xiv) The Land Code (25 June 1999)
(xv) European Economic Community Directive on Wastewater 91/271/EEC (1991)

15. The fundamental legislation concerning environmental protection and conservation in Azerbaijan is the Law on Environmental Protection of 1999 (EP Law, 1999), which lays down the basis for the legal, economic, and social aspects of environment protection. The objective of this Law is to protect environmental balance thus ensuring environmental safety, prevent the hazardous impact of industry and other activities to natural ecological systems, preservation of biological diversity and proper use of natural resources. Detailed information on the most pertinent laws to be applied for this subproject are explained in Table 1:

Table 1: Laws & Regulations on Environmental Protection in Azerbaijan

Legislation	Description
Law on Environment Protection, 1999	This Law establishes the main environmental protection principles, and the rights and obligations of the State, public associations and citizens regarding environmental protection. **According to Article 54.2 of the Law, EIA is subject to SEE**. This also explains that the MENR is responsible for the review and approval of EIA reports submitted by developers. Furthermore, in Articles 81 and 82 of the Law on Environmental Protection (1999), the Law specifically provides for the application of international agreements in case an international institute or body has provisions that are different from those of the Azerbaijani legislation. **Articles 35, 36, 37, and 38: Ecological Demands during Project Design and Implementation.** During the feasibility study, it should be confirmed that the project will comply with: • the maximum permitted discharges and emissions of pollutants in the natural environment • the maximum permitted noise and vibration levels, and other harmful physical influences as well as health norms and standards of hygiene **Article 50: Ecological Expertise** requires identification of impact on environment caused by any activities, examine the results of such impacts and predict possible impacts in accordance with the environmental requirements and qualitative parameters of environment. **Article 54: Objects of the State Ecological Expertise** defines the types of project which require compulsory "State Ecological Expertise (SEE)', i.e. to undergo the systematic EIA process.
State Ecological Expertise (SEE)	SEE mandates an EIA for infrastructure development projects. The objective of the SEE is to identify impacts on the environment caused by construction projects, examine the results of such impacts and propose mitigation measures to prevent adverse effects on the natural environment and people's health. It is essentially a stand-alone check of compliance of the proposed activity with the relevant environmental standards (e.g. for pollution levels, discharges, and noise).
Law on Ecological Safety, 1999	This law defines legal bases of ecological safety as component safety of the state, society and population, the purpose of which is establishment of legal bases for protection of life and health of the person, society, its material and moral values, environment, including atmospheric air, space , water objects, resources of the ground, natural landscape, plants and animals from danger, arising as a result influence natural and anthropogenic action
Law on Sanitary-Hygienic State (GOST 17.1.3.07-82)	This law serves as a basis for drinking water quality standards and mandatory implementation of sanitary-hygienic expertise regarding chemical and biological standards for water quality. Similarly, noise standards are described in GOST 12.1.003-83. However, the GOST does not specify regulations on permitted effluent discharge levels post wastewater treatment. As such, Azerbaijan has adopted

	Directive No 91/271 from the European Environmental Commission (EEC) in GOST. This regulation identifies the allowable biological and chemical levels for sewage effluent. Standards/maximum allowable values notified/adopted by Government of Azerbaijan are in appendices –Wastewater Disposal Standards (**Appendix 2**); ambient air quality (**Appendix 3**) and noise levels (**Appendix 4**).
Water Code (1998)	The Water Code (1998) regulates legal relations concerning the protection and use of water bodies (surface, subsoil, and boundary water bodies) in Azerbaijan. The Law details the obligations of the State with respect to the use and protection of water bodies in terms of monitoring and protection schemes as well as the supervision over the use and protection of water bodies. The items most relevant to the Investment Program include the outlining of (i) the use of water bodies as potable and service water; (ii) the use of specially protected water bodies; and (iii) the use of water bodies for the discharge of wastewaters.
Permission for groundwater use - Decision no 133 dated June 6, 1998 of the Cabinet of Ministers	Prior approval/clearance of the Ministry of Ecology and Natural Resources is necessary for the utilization of ground waters
Construction Norms and Regulations	The Construction Norms and Regulations are identified in SNiP which details how to carry out noise reduction measures to assure compliance with the relevant sanitary norms (section 3.9) and it details regulations on the dumping of excess materials (section 3.12). SNIP III-4-80 also details regulations on construction worker's health and safety. Chapters 2 and 5 provide organizational procedures of construction work sites and material transport. Annex 9 contains standards on maximum concentrations of toxic substances in the air of working zones. Annex 11 specifically claims that workers need to be informed and trained about sanitation and health care issues and the specific hazards of their work.
Rule for Use, Protection and Preservation of Trees and Bushes (2005)	The Rule for Use, Protection and Preservation of Trees and Bushes (2005) is a regulation that details the way to protect trees and shrubs in case of necessary cutting or replanting. These trees are excluded from the Forestry Fund of the Azerbaijan Republic.
Land Code (1999)	Article 22 of the Land Code (1999) stipulates that the state is required to establish protection zones with a special (restrictive) regime for the purpose of construction and operation of industrial facilities
The European Economic Community Directive on Wastewater (1991)	The European Economic Community Directive on Wastewater (1991) regulates the collection, treatment and discharge of domestic wastewater and wastewater from industrial sectors. The directive includes requirements for monitoring the performance of treatment plants and receiving waters. Also, it mandates measures for sludge disposal and re-use as well as means to re-use treated wastewater.

16. **International Treaties/Conventions**. Azerbaijan is signatory/party to most of the environmental-related international Treaties, Agreements and Conventions (see Table below). As stated in Article 151 (Legal value of international acts) of the Azerbaijan Constitution, agreements in International Conventions supersede national laws in case of conflict. This principle is embodied in Articles 81 and 82, Chapter 14 (International Co-Operation on Environment Protection Issues) of the Law on Environmental Protection, 1999.

Table 2: International Conventions/Treaties Ratified by Azerbaijan

S. No	International Convention	Year Ratified
1	UNESCO Convention on Protection of World Cultural and Natural Heritage	1994
2	UN Convention for the Protection of the Ozone Layer (Vienna Convention)	1996
3	Agreement on Mutual Cooperation of the Commonwealth of Independent States in the area of Hydrometeorology	1998
4	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and Agreement on Protection of Sturgeons	1998
5	UN Convention to Combat Desertification	1998
6	UN Convention on Environmental Impact Assessment in the Trans-boundary Context (Espoo Convention)	1999
7	Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)	1999
8	UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention)	1999
9	UNESCO Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	2001
10	UNECE Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes (Helsinki Convention)	2000
11	UN Convention on Biological Diversity	2000
12	FAO Convention on Plant Protection	2000
13	Protocol on UN Framework Convention on Climate (Kyoto Protocol)	2000
14	Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)	2000
15	European Agreement about Transportation of Dangerous Goods on International Routes	2000
16	UN Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)	2001
17	UNECE Convention on Long-Range Trans-boundary Air Pollution	2002

17. **Institutions.** There are four principal environmental institutions (or Ministries in Azerbaijan and the NAR) who handle water resources protection, management and operation. These include (i) MENR, (ii) the Ministry of Health, (iii) the Ministry of Emergency Situations (which implements construction safety supervision and standards and regulates safe sewage discharges and WSS operations), and (iv) AzerSu / State Amelioration and Water Management Agency (SAWMA) who will manage the WSS in their respective areas under the Investment Program:

(i) **Ministry of Ecology and Natural Resources.** Ministry of Ecology and Natural Resources1 (MENR) is the primary institution entrusted with the responsibility of environmental protection and implementation of environmental related laws. The functions and activities of the MENR are sub-divided into the following areas: (i) Environmental policy development; (ii) Environmental protection; (iii) Water monitoring and management; (iv) Protection of marine (Caspian Sea) bio-resources; (v) Forest management; and (vi) Bio-resources and protected areas management. This ministry upholds all natural resource protection laws. The

[1] A Presidential Decree in 2001 transformed the former State Committee for Ecology and Natural Resources 134Utilization (SCENRU) into the MENR. Thereon, along with its inherent mandate from SCENRU, the MENR assumed over the functions of several other state bodies such as the departments of Hydrometeorology, Geology, Forestry, and Fishery.

State Ecological Expertise (SEE) acts within this agency on the Program level in reviewing Environmental Impact Assessments (EIAs).

(ii) **Ministry of Health: (Sanitary and Epidemiology Service sub-body within Azerbaijan only).** Sanitary and hygienic safety is the responsibility of the Ministry of Health. Its main function is the implementation of control over meeting the sanitary and epidemiological rules and standards as well as hygienic standards. This entity implements anti-epidemiological measures throughout Azerbaijan and NAR by legal and physical persons through application of laboratory and sampling controls.

(iii) **Ministry of Emergency Situations (Commission of Emergency Situations in the NAR).** This agency implements construction safety supervision and standards. Their main involvement in this Program will be to regulate leakage from sewer lines, safe discharges from the sewage treatment system, and safe operation of the wastewater treatment plant and water treatment units.

(iv) **AzerSu, Agjhabedi JSC.** Agjhabedi Joint Stock Company (JSC) manages and operates the water and wastewater infrastructure such as the delivery of potable water and the collection of wastewater in Agjhabedi. It also manages and operates the water and wastewater treatment plants in the town.

B. Environmental Assessment Procedure in Azerbaijan

18. **Legislation**. State Ecological Expertise (SEE) under the Law on Environmental Protection, 1999, sets out the requirement for environmental assessment in Azerbaijan. Procedures for Environmental Assessment are stipulated therein. The objective of the SEE is to identify impacts on environment caused by development activities/industrial units, examine the results of such impacts and predicting possible ones, in accordance with the environmental requirements and qualitative parameters of environment (Article 50 of EP Law). Article 52 of EP Law stipulates the Objectives and Responsibilities of the State Ecological Expertise:.

19. The activities, fields and sectors to which SEE would apply are specified in Article 54 (The units controlled by the SEE) of the EP Law as:

- The State and local programs related to development and placement of productive capacities in governmental and economical institutions;
- The documentation of technical and economical substantiation, construction (reconstruction, enlargement, and renovation technology) and destruction of economical capacities, as well as assessment of the project influence on environment;
- Documentation concerning creation of new techniques, technologies, materials, and substances, as well as import of the same from abroad;
- Draft of scientific-methodical and normative-technical documentation concerning environment protection;
- Certain ecological conditions caused by improper work of industry and extraordinary situations;
- Ecological conditions of the regions and individual (separate) natural objects and systems;
- Provisions of draft contracts stipulating use of natural resources, as specified by the relevant decrees of the concerned executive bodies

20. **Institutions**. State Ecological Expertise (SEE) Department, under the Department of Environmental Policy and Environmental Protection of MENR is responsible for the review and approval of environmental impact assessment (EIA) reports submitted by project proponents.

21. **EA Process, Review & Approval**. The SEE adopts a 2-stage approach. The first stage takes about a month and entails an initial examination of the application of the proposed activity and the expected impacts. This stage may also include preliminary consultations with other agencies, NGOs, experts and initial public inquiries on the various aspects of the project. When determined that the project or activity will likely cause only minor impacts on the environment, the application may be approved with some conditions. On the other hand, if the activity is assessed to cause in significant impacts, a full EIA is required. Subsequently in such situation, a scoping meeting of representatives of the developer/applicant, invited experts and invited members of the public will be organized and to be chaired by the MENR. Based on the outcome of this scoping meeting, the MENR will notify the developer on the required scope and depth of the investigation and public consultation during the EIA study.

22. The second stage, which takes around three months, entails a review and investigation by the MENR of the documents submitted by the developer/proponent. A group of 5-11 expert reviewers and experienced members (e.g. members of the Academy of Science, university staff, or officials from other ministries) will be convened to perform the EIA document review and which will be chaired by MENR. The composition of the review group shall be on the discretion of the MENR but will be taken from a roster of experts who can deal adequately with project-specific environmental issues. The expert group will undertake public submissions, investigations, and consultations relevant to the project impacts as deemed necessary in the review process. Consequently, at the end of this stage, a written review of documentation together with recommendations is submitted by the environmental review expert group to the MENR.

23. The MENR then decides on whether to deny the application or to approve it, with or without conditions. In the case of infrastructure construction projects specified, these conditions include construction phase measures such as site management; noise; dust, discharges to the air land, subsurface or water, solid waste management, emergency contingency plans, etc. These conditions are set to assist the proponent/developer control the environmental impacts such that they are maintained at the acceptable limits. Should the application be approved with conditions, either the activity starts with due consideration on the conditions or the proponent/developer may opt to appeal against the conditions and resolutions may be subjected to judicial proceedings.

24. **Post Approval Monitoring**. During construction of the project, the applicant/developer should ensure adherence to conditions attached to the approval and be responsible in monitoring the developments of the projects along with regular reporting to MENR. The monitoring programme of the proponent/developer should be designed to give clear indications prior to conditions being breach. Practical corrective measures should be undertaken by the proponent/developer in order to avoid breach of any conditions stipulated in the approval.

25. The MENR is authorized to issue warning to proponent/developer should it observe that conditions are being breached. In the event, the proponent/developer is obliged to stop the activity which is causing the breach. In such cases, the MENR may reconsider the approval, possibly with the participation of the Environmental Review Expert Group, and the conditions of approval may be reviewed.

26. Should project designs be altered significantly from those presented in the in the feasibility phase EIA, additional reports on the impacts of the changes may be requested by MENR.

C. ADB Policy

27. ADB requires the consideration of environmental issues in all aspects of its operations. Superseding the previous environment and social safeguard policies, ADB's Safeguard Policy Statement, 2009 (SPS, 2009) sets out the policy objectives, scope and triggers, and principles for three key safeguard areas: (i) environmental safeguards, (ii) involuntary resettlement safeguards, and (iii) Indigenous Peoples safeguards. ADB adopts a set of specific safeguard requirements that borrowers/clients are required to meet in addressing environmental and social impacts and risks. Borrowers/clients comply with these requirements during project preparation and implementation. The environmental safeguard requirements are indicated in Appendix 1 of SPS 2009 (Safeguard Requirements 1: Environment). This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans.

28. **Screening and Categorization**. The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact are assigned to one of the following four categories:

(i) **Category A**. Projects could have significant adverse environmental impacts. An environmental impact assessment (EIA) is required to address significant impacts.
(ii) **Category B**. Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
(iii) **Category C**. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
(iv) **Category FI**. Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

29. **Environmental Management Plan**. An environmental management plan (EMP) which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

30. **Public Disclosure**. ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

(i) For environmental category A projects, draft EIA report at least 120 days before Board consideration;

(ii) Final or updated EIA and/or IEE upon receipt; and
(iii) Environmental Monitoring Reports submitted by Implementing/Executing Agencies during project implementation upon receipt

D. Applicability of Environmental Legislations to the Subproject

31. Proposed water supply and sanitation project in Agjhabedi will attract the provision of EP Law, State Environmental Expertise. Therefore requires Environmental Impact Assessment Study and Report and its approval from MENR. The proposed groundwater abstraction also requires permission from MNER.

31. AzerSu is presently in the process of obtaining approvals/permissions from MNER.

E. Extent of this IEE Study

32. The Aghjabedi Town subproject is classified under the ADB SPS 2009 as environment category B, requiring IEE study. This is the IEE Report of the subproject. The purpose of this IEE is to assess potential environmental, health, safety and social impacts of the proposed subproject. No significant adverse environmental impacts have been noted in this subproject assessment.

33. The IEE was prepared during the Investment Program preparation in 2010 and was approved by ADB. The subproject is currently in bid preparation stage. , and although there are major no changes in the subproject design and location of components, the IEE is updated in line with the ADB SPS 2009.

34. The IEE study is conducted based on secondary information, primary data from various sources and field observations. During the site visit the specialists had discussions with town members and local executive powers for their feedback on the proposed project. The results of the social survey with town members as well as an evaluation of the institutional framework have been incorporated into this assessment.

III. DESCRIPTION OF THE PROJECT

A. Azerbaijan Water Supply and Sanitation Investment Program

35. The Asian Development Bank (ADB) funded Azerbaijan Water Supply and Sanitation Investment Program is intended to optimize social and economic development in selected secondary towns through improved water and sanitation (WSS) services. Currently, the WSS sector in Azerbaijan is characterized by institutional weakness, inefficient operation, outdated and dilapidated physical infrastructure and severe financial constraints. As a result, the WSS service levels provided to customers are low and of poor quality.

36. With the improvements undertaken in WSS sector under the ongoing assistance (ADB Loan 2119 - Azerbaijan Water and Sanitation Improvement Project), the Government of Republic of Azerbaijan has requested ADB's continued assistance in developing the country's WSS sector. The Government prioritized for ADB's consideration the implementation of WSS works in a number of secondary towns. The ADB has accepted the possibility of long-term engagement in the WSS sector through the Multi-Tranche Financing Facility (MFF) lending

modality. The MFF modality is expected to comprehensively address WSS sector development through reduced forward processing time, focusing on expeditious and streamlined implementation of physical works, and addressing the much required sector and institutional reforms.

37. This Investment Program will cover: (i) WSS infrastructure development in the towns of Agdash, Goychay, Nakhchivan, Aghjabedi, Beylagan, Balakan and other developing urban centers in the Country including the peripheral areas of Baku; (ii) Management Improvement and Capacity Development of WSS agencies to manage WSS service delivery; and (iii) a Program Management Facility that will oversee the Program development, implementation and management. The Investment Program will be implemented over a period of 8 years (2010-2018).

38. The Azersu Joint Stock Company (AZERSU) will be the Executing Agency for all project activities except those in Nakhchivan Autonomous Republic, where the State Amelioration and Water Management Agency (SAWMA) will be the Executing Agency. The project management Facility (PMF) created at AZERSU and SAWMA will be responsible for supporting project implementation. Each PMF comprises international and national consultants and counterpart staff. At the field level, a Project Implementation Review Committee will be constituted to review monthly implementation progress and ensure timely resolution of operational issues.

B. Agjhabedi Town Sewerage Subproject

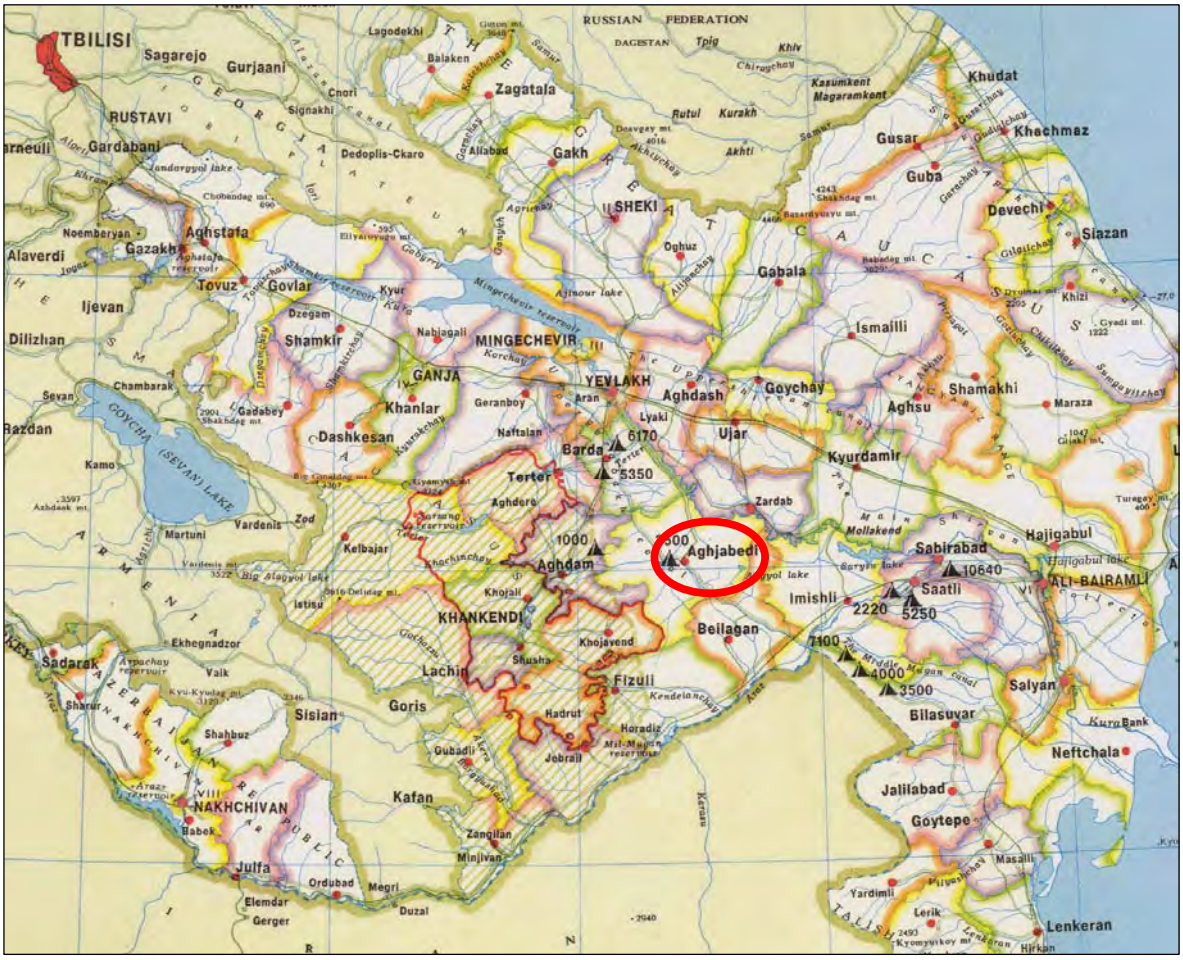
1. Need

39. Located at 363 km southwest of the Capital City Baku, Aghjabedi is an important town in the south central part of the country (Map 1).

40. Lack of water supply and wastewater collection is a major problem for Agjabedi and other towns in the Kura-Araz lowland. In Agjabedi the water supply system was laid in 1970s. The 40 year-old pipelines and storage reservoirs are in urgent need of replacement and/or repair. The existing water supply and wastewater infrastructure permit significant leakage. With the existing system, only 36.1% of the town population receives water supply and only 9% have their sewage collected.

41. The sewerage system in Agjabedi town was put into operation in 1970. The length of the current sewerage system is 13.5 km. The system collects from approximately 9% of the population located in the center of town. Since the sewerage network has operated for many years without repair, the pipes are full and the technical condition of the network is inadequate. Sewage waters are currently directed to the wastewater treatment facility through surface ditches which collect storm runoff also.

Map 1: Project Location



42. Unfinished treatment facilities constructed in the northeast part of town have stopped functioning and deteriorated significantly. Due to a population increase between 1990 and 2008, private houses have been built in close proximity to the existing non-operational wastewater treatment facility leaving no room for a proper buffer zone around the treatment plant.

43. Considering the grave situation, under the Tranche-3 of the Investment program, it is proposed to implement sewerage subproject in Aghjabedi Town, with an objective to establish safe, reliable sewerage system and promote a healthier environment.

2. Proposed Subproject Description

44. The following Table 3 shows the subproject components selected for implementation under tranche-3 in Agjhabedi Town, for which, according to ADB requirement, this IEE has been conducted. Location of proposed subproject components is shown in Map 2. Proposed water sewerage system and location of facilities are shown in Map 3. Proposed WWTP site presented in Map 4. Photographs of project sites are appended in Appendix 1.

45. **Construction of New Wastewater Networks.** The Program will include the installation of 196.7 km of new sewer network ranging from 200-800 mm diameter (84% of total sewer line is of diameter 200-300 mm). The 13.5 km of asbestos concrete sewer pipelines will be abandoned in the ground and left undisturbed due to the environmental risks of repairing these pipelines. The sewer pipes will be laid on the opposite side of the street than the water pipelines, in separate trenches to prevent any leakage of sewage into the water supply.

46. **Construction of New Wastewater Treatment Plant**. A new wastewater treatment plant will be constructed on 5 ha of privately owned land adjacent to the Aghjabedi-Zerdab highway in the northern outskirts of the town. The treatment process will be based on Activated Sludge Process (ASP). The treated sewage will be disposed in a drainage channel flowing adjacent to the site. This drainage channel flows towards northeast from the site and disposes into Bash Mil-Garabag collector canal, about 2.5 km from the WWTP site. Bash Mil-Garabag collector canal flows to southeast, and meets Lake Ag-gol at about 12 km. Ag-gol lake is part of Ag-gol National Park.

Table 3: Subproject Components

Infrastructure	Function	Description	Location
Sewer network with manholes	To collect wastewater from house connections and convey to treatment plant	Total length: 196.7 km Diameter-wise lengths: 200 mm – 145.4 km 300 mm – 20.2 km 400 mm – 15.3 km 600 mm – 10.7 km 800 mm – 5 km Material: corrugated HDPE Road surface will be rehabilitated & reinstated to original after sewer laying work	- Network will cover southern part of the town - Pipes will be buried along the roads on the opposite side of water pipelines - Existing underground AC sewers will be left undisturbed in the ground as it is - Involves no tree cutting
House connections	To collect wastewater from houses and convey to network	7,800 no,s	- House service connections will be laid the household premises
Wastewater Treatment Plant (WWTP)	To treat wastewater to meet Azerbaijan disposal standards	Process system: Extended aeration activated sludge including Capacity: 20,000 m3/day Although actual design is to be carried out by the contractor (design-build contract).	- proposed site for WWTP is located adjacent to Aghjabedi-Zerdab highway in the northern outskirts of Aghjabedi Town - this 5 ha site is privately owned, and AzerSu is in the process of acquiring the site -As the site is vacant

Infrastructure	Function	Description	Location
			-treated wastewater will be disposed in a local drainage channel which will further dispose into Bash Mil-Garabag collector

3. Implementation Schedule

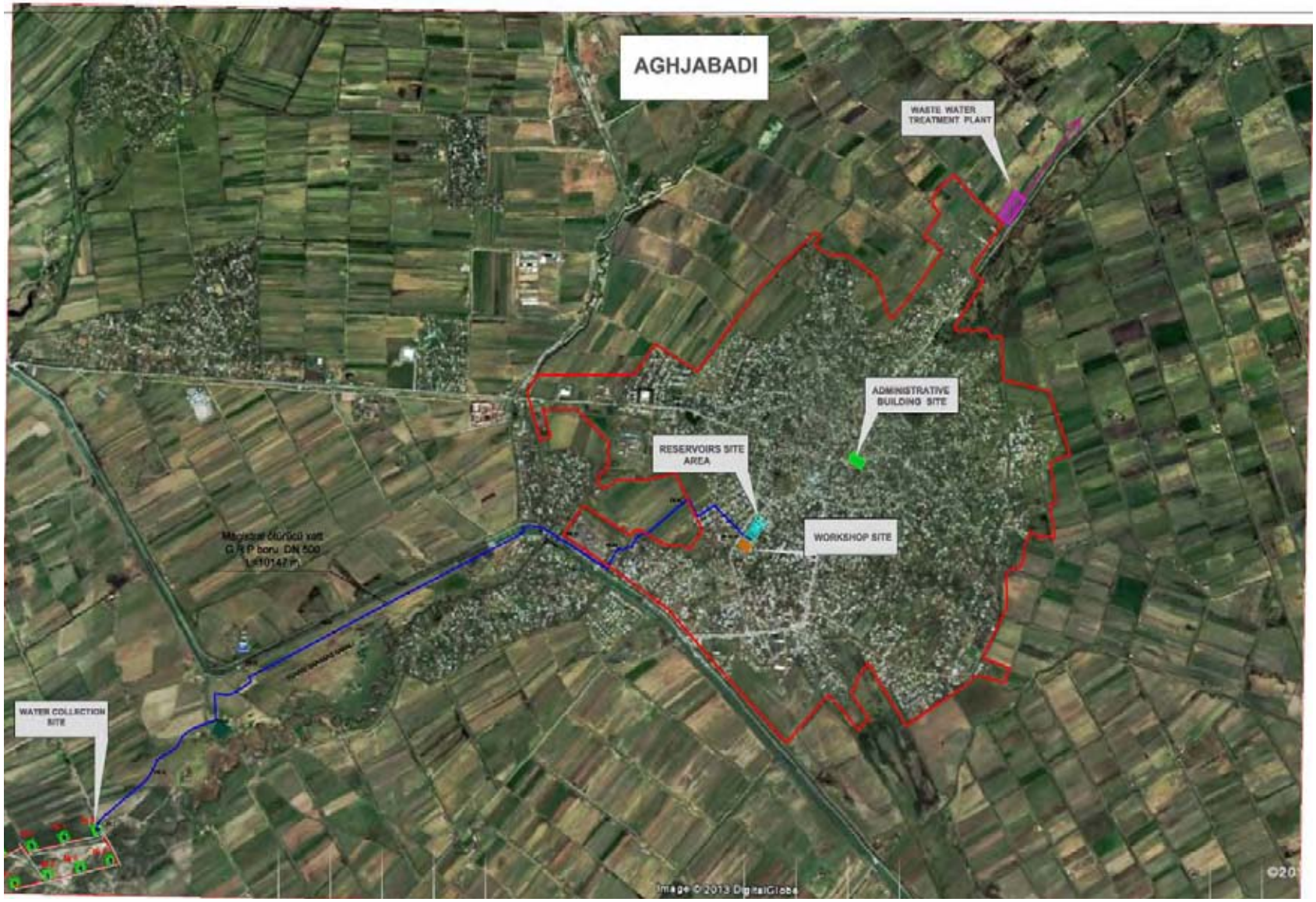
47. The construction work is to be implemented through two packages: (i) wastewater treatment plant as Design-Build Contract, and (ii) sewer network including house connections, sewage pumping station and all the facilities – this will be a civil works contract.

48. Detailed design work of package 2 is completed and is under approval phase. Bid preparation is underway, and the bids are likely to be invited in June 2013 and the bid process would be completed by October 2013. The construction work will commence in November 2013, and will take about 18 months, so it should complete by May 2013.

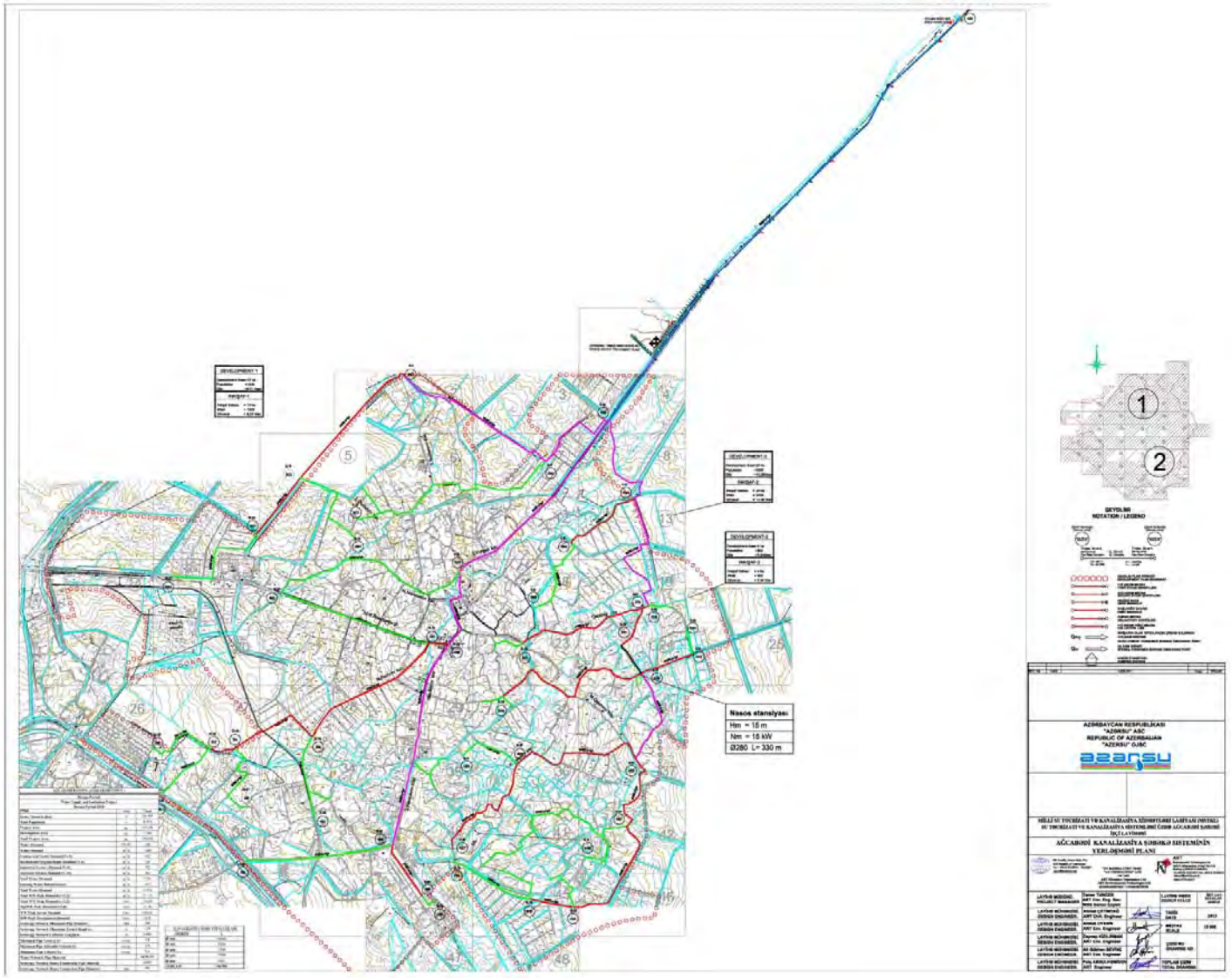
49. For package 1 (WWTP), the conceptual design is ready, and detailed design will be prepared by the selected Design-Build contractor. Bid preparation is underway, and the bids are likely to be invited in June 2013 and the bid process would be completed by October 2013.The design work will commence immediately and should be completed by February 2014. Construction work will take about 15 months, so it should complete by May 2013. This is including commissioning and the trail run period of 3 months. Contractor will also be responsible of operation in the first 3 years, during which the Aghjabedi JSC (Sukanal) staff will be trained in operation and maintenance of the WWTP. Technical know-how will be transferred to the staff.

50. Implementation of both the packages has been planned in such a way that WWTP will be ready for operation by the time construction of sewer network and house connections are completed.

Map 2: Location of Subproject Components



Map 3: Proposed Sewerage System



Map 4: Layout Plan of Wastewater Treatment Plant

4. Construction Activities

51. As indicated in Table 3, there are four main elements in the subproject: laying of sewers; construction of WWTP, and miscellaneous small scale works (house connections, meters, internal roads, fencing, lavatory, guard room, etc. Construction practices of these works are briefed below:

52. **Laying of Sewers**. Sewer network (196 km diameter 200-800 mm corrugated HDPE) will be laid along the roads in the town, within the available roads right of way (RoW). Sewers will be laid in the vacant land available between the tarmac and the building line. In locations where there is no vacant land beside the tarmac or it is occupied by trees, pipeline will be laid into the tarmac to avoid any private land acquisition or tree cutting. The sewer pipes will be laid on the opposite side of the water pipes, in separate trenches to prevent any likely contamination of treated water supplies due to leakages. The existing Asbestos Cement (AC) sewers will be abandoned in the ground and left undisturbed considering the environmental and health risks of working with asbestos[2]. The AC sewers will be marked on the inventory drawings. Trenches will be dug using a backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed alongside, and the pipes will be placed in the trench manually. A sand bed of 20 cm think will be prepared on the bottom and sewers will be placed in the trench manually. Sewers will be joined, after which sand procured from local quarries will be placed alongside and a top of about 10 cm thick. The remaining depth of trench on top will refilled with the excavated soil and compacted manually. Road surface will be restored upon completion of work. The width of trench will be 1.4 m for 800 mm sewers and minimum will be 0.60m for 200 mm sewers. Similarly, the depth of excavation will range from 1.5 m to 6 m. After construction, part of trench will be occupied by pipe and sand beneath, top and side, and trench is refilled with the excavated material. This activity is expected to generate about 21,500 m3 of waste/surplus soil. All trench excavations will be provided by wooden bracing to avoid collapse.

53. **WWTP Construction**. WWTP includes construction various items as indicated in **Table 4**. WWTP involves considerable construction including civil and mechanical structures, although construction activities will be confined to the identified site. Civil construction will be of reinforced cement concrete. Mechanical structures will mostly be of cast iron or steel, and will be imported in the ready-to-install form. The major components - anaerobic tanks, aeration tanks, sedimentation tanks and filtration tanks, will be constructed in partly below and partly above the ground level and fitted with necessary mechanical equipment. For these tanks, a cavity will be created in the ground using back hoe for, and the soil will be used for raising the WWTP ground level and for internal roads. Metal reinforcing rods will be placed and concrete will be tipped into the cavity to create floor of the tanks. To create the walls, metal reinforcing rods will be incased in wooden/steel shuttering and concrete will be poured in, and this process is repeated gradually till required height is attained. Inside surface will be smoothened and finished. Mechanical, equipments like shafts, aerators, diffusers will be brought to site on truck, and installed using cranes or manually. WWTP will be designed by the design-build contractor as per the conceptual design to be provided by AzerSu.

[2] Asbestos piping is dangerous to handle due to the risks of exposure to airborne asbestos fibers which may lead to diseases such as mesothelioma, asbestosis and lung cancer. Working with asbestos piping requires wearing disposable masks and suits, wetting worksites frequently, and using only manual tools for cutting pipes to prevent the formation of high quantities of asbestos particulates in the air. (National Asbestos Management Plan, 2006, Australia)

54. **Miscellaneous Works**. These works includearea facilities at WWTP (fencing, guard room and lavatory) and sewer connections. Septic tank and soak pits will be constructed for disposal of wastewater from lavatories. These works are very minor and simple, and not expected to generated significant waste/debris.

55. **Source of construction materials and Waste Disposal**. In Aghjabedi, construction material such as gravel, sand and aggregate is sourced from existing quarry sites available locally. The material will be procured from government approved quarries only. Surplus/waste soil will be mostly utilized for beneficial purposes and any leftover will disposed off at a suitable site. A disposal site will be identified for this purpose before the start of construction.

5. Operation Activities

56. The new sewer network provided in this subproject will collect domestic wastewater and sewage produced by entire town population. Wastewater treatment facility developed in this subproject is designed to treat the sewage to acceptable wastewater disposal limits[3]. The treated water will be disposed in the Channel flowing adjacent to the site. Alternatively, the treated wastewater can be used for irrigating the fields around the WWTP.

57. **WWTP Operation**. Extended aeration activated sludge including nitrogen and phosphorus removal (advanced treatment) technology is the most commonly used technology in the world which is very efficient and easy to operate and suits to the local conditions (climate) as well. Although the design of WWTP will be carried out by the contractor, the suggested treatment process remain same. The influent wastewater is screened to remove all large objects carried in the collection system. Screens can be classified as coarse and fine screens. After screening, grit chambers are used to remove grit, consisting of sand, gravel or other heavy solids that velocities and specific gravities of these particles are greater than the organic solids in the wastewater. In anaerobic tanks, phosphorus can be removed biologically. The degree of the biological phosphorus removal depends on the contact time. Minimum contact time for maximum dry weather inflow and return sludge flows is 0.5-0.75 hours. Phosphorus removal can also be achieved by chemical precipitation, usually with salts of iron aluminum or lime. For total nitrogen removal, nitrification and denitrification occur in biological reactor. Sludge age is the most important criteria. Biological reactor is aerated by using diffused air system consist of diffusers submerged in the wastewater. Sedimentation tank is used to separate the activated-sludge solids from the mixed liquor. Dewatering is a mechanical unit operation used to reduce the moisture content of sludge because dewatered sludge is generally easier to handle than the thickened or liquid sludge. Aerobically stabilized sludge is dewatered directly by using centrifuges (decanter). Removal of dewatered sludge from plant can not be possible daily. For this reason, sludge storage area is projected. Odor problem, visual problems may occur at this site. To prevent the problems sludge may be conditioned expressly to improve its dewatering characteristics. The addition of chemicals are the most common method. Adding conditioning chemicals to sludge increase the dry solid content. For conditioning of dewatered sludge lime can be used. Lime can increase the quantity of dry solids by 20-30 percent. The capacity of this treatment plant is 20,000 m3/day. The treatment and drying processes kill enteric bacteria and pathogens. The dried sludge will be disposed off at an adjacent identified for the purpose. Also, because of its high content of nitrates, phosphates and other plant nutrients, the sludge is an

[3] As there are no specific wastewater discharge limits set under Azerbaijan's regulations, the Ministry of Health (MOH) adopted the European Economic Community Directive (Directive No 91/271/EEC) to regulate urban wastewater treatment in Azerbaijan.

excellent organic fertilizer and may be the local farmers can be allowed to use the dry material for application to their land.

58. The sewer pipes will not function without maintenance, as silt inevitably collects in areas of low flow over time. The project will therefore provide equipment for cleaning the sewers and other maintenance activity. Piped sewers are not 100% watertight and leaks can occur at joints. Any repairs will be conducted by sealing off the affected sewer, after which the faulty section will be exposed and repaired following the same basic procedure as when the sewer was built. Trenches will be dug around the faulty section and the leaking joint will be re-sealed, or the pipe will be removed and replaced.

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

1. Location

59. Agjabedi is located close to the centre of the south border of Azerbaijan, 363 km south-west from Baku, encompassing an area of 1,765 hectares. The district is part of the Kura-Araz lowland and lies on the Mil Plain enclosed between the Kura and Araz rivers. Agjabedi town is completely surrounded by rural lands including mainly arable fields.

2. Topography

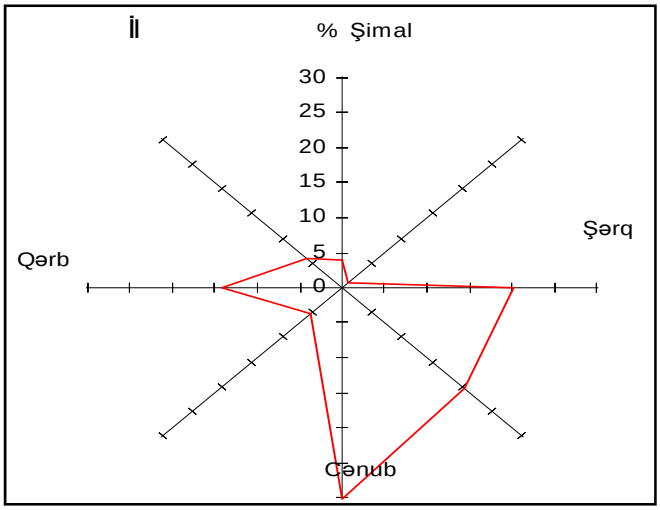
60. The Agjabedi district is uniformly flat with a small gradient. The ground elevation ranges between 0 m and 16 m (average 7 m MSL elevation) and the slope is approximately 0.0005. The relief of the region peaks at the Lesser Caucasus foothills at 180 m MSL and descends to a flat alluvial steppe at -7 m MSL at the Aghgol National Park lake.

3. Geology and soils

61. The Agjabedi region contains two dominant types of soil: sierozem and meadow. The meadow soils are located from lowland semi-dry areas up to arid steppe areas. The soil has a light, loamy structure and a medium degree of salinity. The sierozem soil is very similar to the meadow soil with the exception that is has a higher quantity of salinity. Both soil types are not that susceptible to erosion processes and they contain the necessary nutrients to cultivate crops. The soils in the region are typically used as pastures in the winter and arable lands in the warmer months.

4. Climate

62. This region has a dry sub-tropical climate with a moderate winter and a dry, hot summer. The average annual temperature is +14^{o}C and the annual average precipitation level is 360 mm. The absolute temperature maximum and minimum were recorded as +42^{o}C and -21^{o}C respectively. The highest temperatures are usually registered during July and August and the lowest temperatures occur in January. August is



the driest month receiving on average of 25 mm of rain while March-May is the wettest season with an average monthly rainfall of 40 mm. The main wind directions are northwest in the wintertime and southeast in the summer (see wind rose).

Table 3: Climatic Characteristics (Aghjabedi meteorological station, H=14m)

Name	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Avg
Average temperature (oC)	1.8	3.8	7.0	12.6	19.1	23.3	26.0	25.6	20.8	15.1	8.8	3.7	**14.0**
Absolute maximum (oC)	22	27	34	34	38	40	41	40	37	35	28	26	**41**
Average maximum (oC)	6.8	9.4	13.2	19.8	25.9	30.7	33.0	32.6	27.9	21.8	14.3	8.7	**20.4**
Absolute minimum (oC)	-24	-18	-12	-3	2	8	11	9	2	-4	-11	-22	**-24**
Average minimum (oC)	-2.0	-0.5	1.9	6.7	12.5	16.0	18.7	18.0	14.6	9.8	4.3	-1.2	**8.2**
Rainfall, mm	27	27	37	32	36	29	16	13	29	32	32	22	**332**
Wind velocity m/s	2.0	2.3	2.6	2.5	2.4	2.5	2.3	2.2	2.2	2.0	1.6	1.7	**2.2**
Relative humidity, %	84	80	77	72	68	62	60	64	71	79	82	82	**73**
Absolute humidity, mb	5.8	6.4	7.5	10.4	14.8	17.6	20.3	20.4	17.4	13.5	9.6	6.8	**12.5**
Humidity insufficiency, mb	1.4	2.0	3.0	5.3	8.5	13.0	16.5	14.0	9.0	4.5	2.5	1.8	**6.8**

Avg = average

5. Surface Water

63. Aghjabedi is orographically located in south-east of Garabagh plain which is part of Kura Araks lowland. Relief of the area reflects flat alluvial-prolluvial-dealluvial plan stretched from foothill of the small Caucasus to Kura River. Ground elevation ranges from 7 to 16 m, and gently sloping. There are some isolated hills dotting the plain. There are four main natural streams flowing through the Agjabedi district including the Kura River, one of the longest and largest rivers in Azerbaijan and three of its eventual tributaries. All the rivers originate in the Lesser Caucasus mountains. Gargarchay River flows adjacently to Aghjabedi Town. This river is formed by merger of Khalfali and Zarislichay River which flow through east foothill of Garabagh ranage of Small Caucuses. Originally, Gargarchay River was a feeder for Ag-gol Lake in the Ag-gol National Part in the northern side of the town. However, the river was diversted to Kura River by an artificial channel in 1950s. The lake now fed by two artificial canals - Yuhari-Garabag canal and Bash Mil-Garabag collector.

64. The important artificial sources of water in the region include 1) the Yuhari-Garabag canal which was constructed in the 1950's after the creation of the Mingachevir water reservoir and 2) the Bash Mil-Garabag collector which will collect the wastewater discharge after treatment and provide irrigation water to the town. The Bash Mil-Garabag collector is the main source of water for the lake in nearby Ag-gol National Park.

6. Groundwater

65. Aghjabedi is geologically characterized by sediments by III and IV periods. Geomorphologically, Aghjabedi is part of Kura-Araks lowland. Groundwater is widely available in modern period alluvial sediments, sands, loamy sands and clayey sands. The depth of groundwater in the studies area ranges between 1.2 to 4 m. Thickness of impervious stratum through the area is 15-17 m. Seasonal variation in groundwater level 0.5 – 1m. Maximum value of the groundwater level is usually observed in April-June while minimum drop-down levels in December – February months. Water permeability of the impervious stratum various from 8.84 m2/day to 15.62 m2/day while the filtration coefficient is respectively from 1.17 m/day to 1.99 m/day. Confined aquifer ground waters are widely spread in the study area. First confined aquifer is spread in the sediments of Khazar-Khvalin stratum.

66. **Springs and Groundwater Water Quality.** Table 3 indicates that the Mughanli source has good water quality. The source water will be extracted and disinfected at the reservoir site. No other water treatment is necessary. Mitigation measures are discussed in Section IV to prevent contamination of the Mughanli source water.

67. Water quality samples were taken at the Mughanli source site on 31 January 2009. The sample was analyzed by the National Geological Exploring Service Unit of the Ministry of Ecology and Natural Resources (MENR). Chemical analyses were taken from two wells in Mughanli which showed that the groundwater meets the requirements of GOST 2874-82, Azerbaijan's potable water quality regulation as shown in Table 3. The investigations concluded that the subterranean waters are sweet and the mineralization degree is within the range of 1.0 g/l. In terms of chemical structure, the subterranean waters contain hydrocarbonate-sulphate, a type of salt. General hardness of the water is approximately 6.0 mg-eqv/l. The results of bacterial analysis indicated that the quantity of micro-organisms is below GOST 2874-82 "potable water" limits. No groundwater pollution was identified in the territory, so the sanitary condition of the area is considered satisfactory. More frequent water quality testing will be recommended for the well site in the Environmental Monitoring and Management Plan.

Table 3: Water Quality Chemical Results

No	Water Quality Indicator	Mughanli well No1	Mughanli well No2	Max Allowable Level, mg/l *
1.	Smell at 20^{o}C temperature	0.00	0.00	**<2**
2.	Color	0.80	1.30	**<20**
3.	Turbidity	0.00	0.00	**<1.5**
4.	ph	6.7	6.9	**6-9**
5.	HCO_3^-	274	274	**>3**
6.	SO_4^{2-}	139	141	**<500**
7.	Cl^-	73.0	52.0	**350**
8.	Ca^{2+}	101	102	**180**
9.	Mg^{2+}	20	23	**40**
10.	Na+k	64	44	**170**
11.	NO_2^-	0.03	0.03	**<0.1**
12.	NO_3^-	0.00	0.00	**<10**
13.	NH_4^+	0.00	0.00	**<2.0**
14.	Fe^{3+}	0.00	0.00	**0.3**
15.	Hardness	6.68	6.98	**7.0**
16.	Mineralization	534	499	**<1000 (1500)**
17.	Solid residue	550	520	**<1000 (1500)**

* GOST Drinking Water Standards, 1992.

B. Ecological Resources and Items of Archaeological Significance

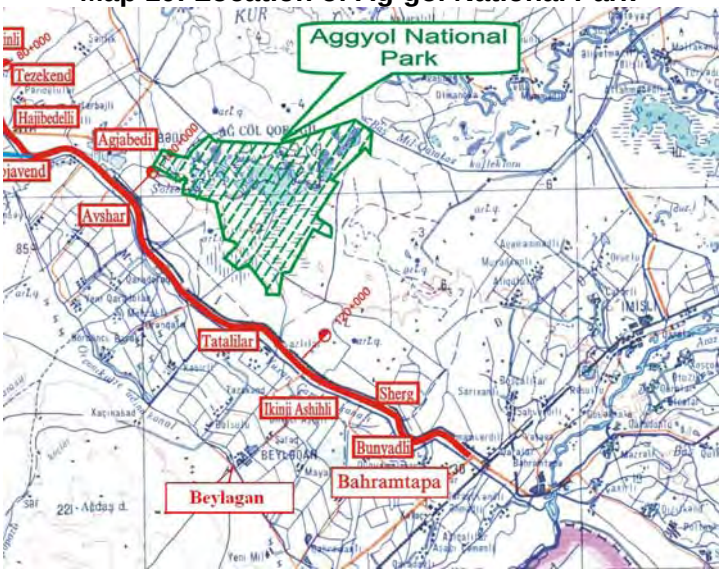
68. Agjabedi town itself is fully urbanized and surrounding settlements have intensive agriculture as the predominant land use. Three green parks exist and many houses have small private gardens. However, apart from the parks and green centers, there are no significant ecological resources, nor rare or endangered flora or fauna within the town boundaries.

69. Historical and archeological sites include remainders of the Bronze Age, which are located in Agjabedi town. (These are named Kultepe, Saribashtepe, Uchtepe, and Shakhtepe).

Also, there is a mosque of local importance, a memorial monument for the Agjabedians who died in the Second World War, and a town cemetery. All designs avoid these cultural and historical sites.

70. No national reserve is located within Agjabedi town. Aghgol National Park is the closest reserve, located 5 km to the southeast. Attachment 3 shows the proximity of the town to the National Park. The park is semi-desert covered by dense ephemeral vegetation. It includes a lake fed by the two artificial canals aforementioned, the Yuhari-Garabag canal and the Bash Mil-Garabag collector. The Park was created to protect the breeding areas for important species of birds.

Map 10: Location of Ag-gol National Park



C. Human and Economic Development

71. **Occupations.** The base of the district economy is agriculture. The total area of the lands suitable for agricultural use in the region is 529 km^2. Crops include grains, vegetables, and cotton. Animal husbandry is the most developed sector of agriculture (387 km^2). Due to some limited opportunities in the town, 3% of men work abroad to bring home money to their families. Also, women work in the public services such as in teaching, medicine, and nursing.

72. **Health Care.** There is a relatively decent representation of health care facilities within the Agjabedi region. Twelve hospitals and medical institutions exist.

73. **Education.** There are 35 pre-school institutions and 62 educational schools in the Agjabedi region. Two technical/vocational schools exist and one university. Overall, the literacy rate for Agjabedi is approximately 99.5%.

74. **Roads and Bridges.** 18 miles of roads are paved in Agjabedi and the remaining 23 miles are covered with gravel. Bridges exist over the irrigation and combined sewage/storm water channels. A major highway of importance to Azerbaijan is located close to the town; The

Mingachevir-Bahramtepe highway was built to connect the southern part of the country with roads to the western borders.

75. **Disadvantaged.** 13% of the town population is considered poor (2008 Speech of the Chairman of the State Statistic Committee). Unemployed people in Agjabedi suffer the most with the water supply because of their difficulty in paying for the water. Women and children of households not located close to the distribution systems taps or water trucks hold the burden of having to manually obtain potable water from the closest tap or truck. However, with the expansion of the distribution system under this subproject, there will be less disadvantaged women and children.

D. Socio-Cultural Resources

76. **Population.** Agjabedi has a gender ratio (male: female) of 0.49 for the overall district. A detailed assessment of the socio-economic profile of the Agjabedi sub-project is provided in the accompanying Poverty and Social Analysis documents which accompany this IEE appendix.

77. **Ethnic Groups –** Of the 36,000 people living in Agjabedi, the majority are ethnic Azeris. Approximately, 3,700 refugees are located in the town of Agjabedi. There are no indigenous peoples in the region.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

78. This section of the IEE reviews possible subproject-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB Environmental Policy requires that impacts and risks shall be analyzed during pre-construction, construction, and operational stages in the context of the subproject's area of influence. As defined previously, the primary impact areas are (i) sewer network sites; (ii) WWTP sites (iii) main routes and/or intersections which will be traversed by construction vehicles; and (vi) quarries and borrow pits as sources of construction materials. The secondary impact areas are: (i) entire Aghjabedi area outside of the delineated primary impact area; and (ii) entire Aghjabedi Rayon in terms of over-all environmental improvement.

79. The screening process carried out for the IEE has identified minor possible adverse environmental impacts likely to be caused by the Project. Most potential negative impacts may occur during construction. However, they will be temporary and can be mitigated to acceptable levels. Effort are made to (i) limit specific impacts related to the sewer network routes; (ii) mitigate source contamination, (iii) eliminate risks of sewer system leakage and (iv) minimize construction pollution and waste.

A. Pre-Construction (Design & Location) Impacts and Mitigation Measures

80. **Disposal of Sewage, Impairment of Quality of Receiving Water Body and Land Pollution.** The proposed sewerage system will collect wastewater from entire town and an adequate capacity WWTP is being developed under this subproject. This will treat the sewage to desirable standards (**Appendix 2**). A suitable site for WWTP has been identified in the northern side of the town, where the sewage from the town can flow under gravity. The treated water will be disposed in a drainage channel flowing adjacent to the WWTP site. This drainage channel flows northeast and joins Bash Mil-Garabag collector canal about 2.5 km from the WWTP site. Bash Mil-Garabag collector is a major canal and carries considerable volumes of water, and ultimately feed into Ag-gol Lake in Ag-gol National Park in the southeastern direction

at about 12 km. Considering the following no impacts envisaged on the receiving water body, and there will no changes in water quality of lake due to disposal treated wastewater in the feeder canal of the lake: (i) treatment as per the standards; (ii) high canal flow resulting in high dilution of treated water, and (iii) travelling distance of 14.5 km in open channel from WWTP to lake – allows further natural treatment through aeration. Existing channel, however, covered with vegetation, and the condition is very poor. Improvement of this should be included in the subproject. Alternatively, the treated wastewater can be used for irrigating the fields around the WWTP. There are no endangered species or sites of historical significance recognized in the alignments or within the land plots designated for proposed works. Also, the environmental assessment safeguards include a Detailed Measurement Survey to ensure that no designs will cross culturally sensitive areas such as the cemeteries (see Resettlement Framework). The Resettlement study will also ensure that any damage to crops or agricultural areas will be compensated appropriately, according to ADB standards.

81. **Damage to Soil, Crops, and Sensitive Areas.** There are no endangered species or sites of historical significance recognized in the alignments or within the land plots designated for proposed works. The only protected area is Ag-gol National Park located approximately 5 km from the town. As this Park is relatively removed from the town, there is no risk for the pipeline routes to be located in this nationally protected area. Also, the environmental assessment safeguards include a Detailed Measurement Survey to ensure that no designs will cross culturally sensitive areas such as the cemetery, bronze age archeological sites, the mosque or the museum (see Resettlement Framework). The Resettlement study will also ensure that any damage to crops or agricultural areas will be compensated appropriately, according to ADB standards.

82. **Resettlement.** There are no foreseen Resettlement issues, except WWTP site; all the other facilities and pipelines sites are located within the government owned lands. WWTP site is privately owned, the Resettlement Plan of this subproject addresses this issue. In the event emergence of any new issues during implementation, for instance for new pipeline routes, a Resettlement Framework (RF) has been prepared to guide the program management facility (PMF) during detailed design and subproject implementation.

83. **Treated Water Quality.** Quality of water meets the standards stipulated by Azerbaijan's potable water quality regulation. Water can be supplied directly after disinfection with chlorine. A disinfection facility and a laboratory is proposed in the subproject to enable chlorination and regular water quality monitoring. Chlorine residual level and water turbidity will be analyzed on a regular basis. To ensure raw water quality, the JSC will test the Aghjabedi water source monthly and seasonally and determine whether MOH parameters are met.

84. **Sewer Pipeline Design.** In the town, new water and sewage lines will be constructed. The pipelines will have enough capacity to receive the 2034 projected flow rates and in the case of the sewage pipelines, the pipes will have enough grade to provide appropriate flushing velocities. The water and sewer pipes will be placed on opposite sides of the street. Also, water pipes will be constructed with PVC or HDPE on a sand bed. Additionally, sewer collectors will be constructed in PVC.

B. Construction Impacts and Mitigation Measures

85. **Construction Risks, Pollution and Wastes.** Since the work will be conducted in an urban area congested with people and activities, it is likely to have considerable impacts. Most of the likely impacts are associated with the construction process, and are produced because that process is invasive, involving trenching and other ground disturbance. Impacts mainly arise from (i) generation of waste soil/debris and their disposal; (ii) mining of construction materials; (iii) soil erosion from excavated areas and silting/pollution of water courses, rivers; (iv) generation of dust and emissions from construction activity; (v) inconvenience/disturbance to public due to construction activity such as impediment of access to houses and business, noise, dust, traffic blockages and public safety; (v) disruption of services like water supply, power, telephone, gas; (vi) safety risk to public and traffic; (vii) Safety risk due to presence of underground AC sewers, and (viii) workers safety and impacts due to import of workers and temporary labour camps.

86. However the routine nature of the impacts means that most can be easily mitigated. These are common impacts of construction in urban areas, and there are well developed methods available for their mitigation. These effects can be mitigated via wetting water surfaces, proper scheduling installing silencers, constructing shoring in the trenches, and redirecting runoff. There will also be provisions for solid waste and used oil collection containers, with further removal to specially allocated disposal and reclamation sites. Sanitation facilities will be constructed at the work sites. After completion of construction works, all job sites will be cleaned.

87. The depth of trench required for sewer lines in some stretches will be as high as 3-6 m, and these excavation pose risk of collapse and differential settlement of nearby structures affecting their stability. Trench protection measures (wooden bracing, sheet piling, etc) should be implemented on all trenches of over 1.2 m depth or as required considering the site condition.

88. Construction of WWTP will also involve considerable excavation/earthwork for tanks and foundations, although exact quantity is not yet known. The typical impacts of earthwork and surplus disposal are minimal due to the fact that the site is located away from the town with no major activities nearby, and the surplus soil will be utilized within the site for raising the ground level and/or for construction.

89. All the construction impacts and appropriate mitigation measures, monitoring measures and the agencies responsible for mitigation are presented in the Construction-stage Environmental Management Plan (Table 7) and Environmental Monitoring Plan (Table 9). This EMP will be part of the contract document and it will be binding on the contractor for implementation.

C. Operation Impacts and Mitigation Measures

90. There are also certain environmental risks from the operating sewerage system, most notably from leaking sewer pipes as untreated feacal material can damage human health and contaminate both soil and groundwater. The sewer pipes will not function without maintenance, as silt inevitably collects in areas of low flow over time. It will be imperative therefore that the agency responsible for operating the sewerage system establishes a procedure to routinely check the operation of the sewers, and to implement rapid and effective repairs where necessary. If trenches are dug to locate and repair leaks or remove and replace lengths of pipe,

the work will follow the same procedure as occurred when the infrastructure was provided. The project will also provide equipment for cleaning the sewers to avoid blocking, overflowing and other maintenance activity.

91. As these repairs and maintenance work will be infrequent, and will affect individual small locations for short periods only, the impacts should be much less significant thus be negligible.

92. Regular monitoring will be conducted at WWTP to ensure that the treated water meets standards. There is occupational health and safety risk involved while working in WWTP however all the necessary precautionary measures are included. Adequate manpower, operation and maintenance equipment will be provided. Necessary training will also be provided to the personnel. No impacts due to disposal of sludge envisaged as the sludge will be dried before its disposal. The treatment and drying processes kill enteric bacteria and pathogens.

93. There is at present no wastewater treatment facility in Aghjabedi and the staff of Sukanal has no expertise or experience in operation and maintenance of WWTPs. It is therefore necessary that staff are trained adequately before taking over the WWTP from design-build contractor, and also should be provided with necessary technical manuals in the Azhari language.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

94. According to Azerbaijan regulation, public consultation for any Project has to be carried out twice – first at the detailed design stage (to address all important comments) and secondly at the end of the project when presenting Project results. All Project stakeholders as well as any affected persons (APs) have to be present at the second public consultation. Results of the first public consultation have to be documented in the Environmental Impact Assessment. Azerbaijan mandated the Public Participation in Decision-Making and Access to Justice in Environmental Matters at the UNECE Aarhus Convention in 1999. Since that time, the Aarhus Centre had been open to the public in the office of MENR. All Project documents related with environmental questions have to be stored in Baku's Aarhus Centre for easy access by the public and NGOs' representatives. A copy of the Environmental and Social Assessment documents also has to be filed at the public library (or any other relevant organization) of the Project town and must be accessible in Azeri.

95. ADB also requires public consultation in the environmental assessment process. For category-B projects, the borrower must consult with groups affected by the proposed Program and with local nongovernmental organizations (NGOs) if possible. The consultation needs to be carried out as early as possible in the Program cycle so that views of affected groups are taken into account in the design of the Program and within the mitigation measures proposed. Any grievance redress issues will be resolved according to the Program’s Resettlement Framework.

96. In accordance with ADB’s Public Communications Policy (2005), consultations were held in 2009 and the proposed Program components and timeline of construction was disclosed to the public and local authorities. Public consultation has played an important role in the preparation process to screen design options to minimize social and environmental impacts. Issues raised in these consultations have been incorporated in the proposed mitigation measures. On March 2, 2009, information on the Program was disclosed to the public through a town meeting in Aghjabedi. The day before the meeting, the local social specialist, a native of Azerbaijan, randomly sampled and invited locals on the street to join this meeting and give input on their water supply and wastewater collection experiences as well as to learn about the

Program and provide recommendations. The social specialist then organized a meeting with the town mayor, other local executive powers, the Program engineer, and the local and international environmental specialists. This team of specialists, the Program engineer, and the mayor then met with 39 randomly sampled town members, both men and women (approximately 55% were women) at the town hall. In the beginning of the town meeting, the engineer explained the proposed improvements the Program would provide to the existing water supply and wastewater collection systems. The locals then answered the questions indicated in Attachment 5. To ensure understanding of the Program and the questions, the social specialist explained each question and allowed for open communication including questions and comments during the meeting. The social specialist noted the environmental and health concerns raised by the town members. He also noted contact information of the town members and who amongst the town members would be interested in participating in a Town Water User's Association to be created under the Program.

97. Additional interviews with the affected people including land owners were conducted in accordance with the Resettlement Framework. To see the results of public consultation with the affected persons, please see the Resettlement Plans for the Program.

98. According to the discussions with 39 members of the town, the following water and wastewater statistics were obtained:

(i) 51% of respondents said that they get water from water trucks, while only 20% of respondents get water from the tap.
(ii) 18% of respondents must walk to their water source. The maximum distance to the water source was noted to be 3 km, taking one hour, while the minimum distance was noted as 300 m.
(iii) 69% are dissatisfied with the water quality, while 26% of respondents are always satisfied.
(iv) 72% of respondents either always lack water supply or lack supply during some days or hours.
(v) 62% of respondents are dissatisfied with the water pressure. 20% are satisfied.
(vi) 18% have fallen ill because of poor water quality.
(vii) 46% of people are willing to pay for water supply and sewage collection.
(viii) 85% of respondents have sewage problems on their property.
(ix) 64% and 79% stated that they work for industries which would be eager to connect with the Azersu water supply network and wastewater collection network respectively.
(x) 72% of respondents stated that they would like to join a local 'Town Water Users Association'.

99. According to the discussions with the town community, overall the town members expressed willingness to participate in the Program in the Town Water Users Association in the following manners:

(i) Be consulted about design plans
(ii) Participate in the monitoring of the activities
(iii) Obtain contacts of the organizations in charge of implementation and quality control of the work
(iv) Provide labor (which will also bring economic benefit to the town)

100. Primary environmental concerns for the town include:

(i) Continuing limited supply of potable water due to interruptions in electricity
(ii) Higher electricity costs and water and wastewater tariffs imposed by the new 24 hour water supply and wastewater treatment

101. Issues raised in these consultations have been incorporated in the proposed mitigation measures. Continuous dialogue with the town and relevant governments will be carried out during the implementation period. During implementation, the social and environmental specialists will coordinate with the JSC and Rayon administration and will ensure that any concerns and issues raised by the Town Water User's Association will be addressed and adequate feedback to the town will be provided.

102. The draft IEE reports were disclosed to public, made available (in Azeri language) available in public places for the project-affected and local NGOs. All the comments have been addressed and the report finalized.

VII. GRIEVANCE REDRESS MECHANISM

103. As the work is being done in an inhabited area, most of the impacts are construction-related, and therefore it is anticipated that improper or inadequate implementation of Environmental Management Plan may lead to disturbance and inconvenience to local people. In order to provide a direct channel to the affected persons for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, PMF will establish a Grievance Redress Mechanism, which will be functioned throughout the construction period.

104. A complaint register will be made available at the site office of the contractor, with a display board indicating availability of such facility. This will accept complaints regarding the environment safeguard issues in implementation of the subproject. The grievances received and actions taken will be included into the environmental monitoring reports submitted to ADB. The following process will be followed in grievance redress: Complaints received (written or oral communication) will be registered in Complaint Register assigning complaint number with date of receipt. Supervision Consultant (SC) will review the complaint and direct the contractor for necessary action. In case of no satisfactory action, the complainant can approach Aghjabedi JSC for necessary action. For this purpose Aghjabedi JSC will open a facility to receive complaints with the support of Town Water Users Association. JSC will coordinate with the SC and PMF to resolve the issue.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Impact Mitigation and Monitoring

105. An Environmental Management Plan, consisting of impact mitigation and monitoring plan, is prepared as part of this IEE. The EMP is designed to follow the general template established during the preparation of the candidate subprojects, but adapted to the specific requirements of the subproject in question. The EMP has been updated and expanded and will be appended to the tender documents (particular conditions of contract). As part of the environmental management, the procedures for: workers' health and safety; public safety and reduce inconvenience and disposal of construction wastes, etc are developed.

106. A program of monitoring will be required to ensure that all concerned agencies take the specified action to provide the required mitigation, to assess whether the action has adequately

protected the environment, and to determine whether any additional measures may be necessary. Regular monitoring of implementation measures by Civil Contractors will be conducted by the PMF, and overseen by AzerSu. Monitoring during operation stage will be conducted by the Operating Agency, Aghjabedi JSC.

107. During construction, most of the mitigation measures are fairly standard methods of minimizing disturbance from building in urban areas (maintaining access, planning work to minimize public inconvenience and traffic disruptions, finding uses for waste material, etc). Monitoring of such measures normally involves making observations in the course of site visits, although some require more formal checking of records and other aspects. During the construction, the air quality and noise must remain below specified concentrations and levels. The maximum allowable concentrations of air quality toxins are specified in Appendix 3 and the maximum allowable noise levels are specified in Appendix 4. The monitoring of ambient air quality and noise levels during construction is the responsibility of Contractor. The Program Consultant will supervise and monitor the contractor's performance during the construction

108. The following Tables 6 to 8 show Environmental Management Plans respectively for various stages – preconstruction, construction and operation. These show mitigation activities, methods, project agencies responsible for implementation and monitoring of mitigation measures. The following Table 9 shows the proposed Environmental Monitoring Plan for this subproject, which specifies various monitoring activities to be conducted. It describes: (i) mitigation measures, (ii) location, (iii) measurement method, (iv) frequency of monitoring and (v) responsibility for monitoring.

Table 6: Environmental Management Plan - Preconstruction

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Receiving Water Body Protection. and odour nuisance	• Design WWTP for adequate treatment of sewage (meeting disposal standards indicated in Appendix 2) • Ensure appropriate sludge treatment and disposal facilities • Develop adequate green buffer around the treatment facility • Take water quality samples of receiving water body to see if water body can accept proposed biological load from the wastewater treatment plant • Rehabilitate the drainage channel – clear vegetative growth, and provide proper channel cross section for free flow. • Perform daily testing of wastewater effluent at outlet and downstream • Develop a green buffer zone around the site • Develop Standard Operating Manual for regular operation, and periodic and preventive maintenance. • Provide necessary training to the operating staff	PMF and JSC	Inspection of detailed design documents, and contract documents.
Damage to Soil, Land, Ecology, Heritage • Soil erosion, land instability and damage to forests or vegetation	• Mainly confine subproject works to previously disturbed areas, access roads and tracks • Avoid environmentally sensitive sites and those that would have negative impact on cultural heritage such as cemeteries • Improve drainage where necessary • Avoid constructing new access roads for water intakes, pipelines and reservoirs, but provide small access tracks for light vehicle access during construction and walking tracks for O&M of completed facilities	PMF and JSC	Inspection of detailed design documents, and contract documents.
Damage to Crops and Tree Plantations • Damage to tree plantations and crops	• Avoid or minimize resettlement and damage to crops or plantations by adopting suitable locations and alignments for Program facilities and pipelines • No trees shall be cut for laying sewers; pipeline shall be laid into the tarmac if there is no vacant land between the building and road; use flexible pipes such as HDPE/PVC, so that it allows a small/local alignment change where required to avoid tree cutting • Replace all vegetation destroyed accordingly if categorized under the Rule for Use, Protection and Preservation of Trees and Bushes (2005)	PMF and JSC	Inspection of detailed design documents/drawings, and contract documents.
Resettlement • Dislocation or involuntary resettlement of residents and businesses • Program effects on land and environment	• Install water and wastewater pipelines in existing roads, footpaths or rights of way (ROW) wherever possible • Restrict road and drain upgrading to existing ROW where possible • Consult affected persons, prepare Resettlement Plans and provide adequate compensation and grievance redress mechanisms in line with ADB and Government resettlement policies enumerated in the Resettlement Framework • Provide information disclosure and public consultations in accordance with ADB's Public Communications Policy (2005)	PMF and JSC	Inspection of detailed design documents/drawings, and resettlement plan report

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	• Implement appropriate compensatory measures, as per the RP, for WWTP Site land acquisition		
Treated Water Quality • Safeguard quality of water supply and wastewater discharge	• Cover, ventilate and fence all treated water reservoirs • Design distribution network for minimum residual pressure of at least 10 m to prevent entry to mains of contaminated groundwater or backflow • Provide adequate spare parts	JSC	Inspection of detailed design documents, and contract documents.
Design of Sewer Lines • Sewage leakage into potable water	• The sewer pipelines must be constructed at a lower elevation than water pipelines and in different trenches to prevent leakage of sewage water into the water supply. • Wastewater pipes should be constructed with uPVC or HDPE on a sand bed	Construction contractor, PMF and JSC	Inspection of detailed design documents, and contract documents.
Increased sewage and impacts due to its disposal	• Improvement to water supplies will result in an inherit increase in the generation of wastewater. Detailed design calculations must account for the potential impacts of increased sewage generation in each community to verify that channels and infiltration rates can accept increased flow. • Develop a treatment facility to treat the wastewater to desirable standards and with a safe final disposal • Do not commission the new sewer network until the WWTP is constructed and ready for commissioning •	PMF, JSC	Inspections of project components and implementation schedule

Table 7: Environmental Management Plan - Construction

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Removal of vegetation/trees for construction	• Sewer lines along the roads shall be laid into the roads or vacant space; no road side trees shall be removed for this purpose • Use flexible pipes such as HDPE/PVC allows a small/local alignment change where required to avoid tree cutting • Bushes and grasses shall be cleared only in actual construction area all other preparatory works (material storage, mixing, etc) shall be conducted on barren lands where there is no vegetation • Minimize tree cutting at Reservoir Site No.1 by better site layout; plant two trees of same specie for each tree that is cut for construction.	Construction Contractor	Review construction drawings prior to start of construction Site inspections and construction records
Excavation could damage utilities existing infrastructure along the roads	• Avoid disruption of existing infrastructure lines (power supply, telephone, gas etc) by a proper pipeline alignment • In unavoidable cases, identify the services to be affected in each area and coordinate with respective agencies for alternative arrangement • Provide prior public information about the likely disruption of services • In the event of water supply disruption beyond reasonable time , provide water supply through alternative means, for instance, through tankers	JSC in assistance of Contractor	Review construction drawings prior to start of construction Site inspections and construction records; interview with local people
Impacts due to excavation and generation of waste soil/debris (soil/)	• Utilize waste/surplus soil for beneficial purposes - in construction activities or to raise the level of land prior to construction of roads, buildings, etc, or to fill previously excavated areas • Dispose the surplus soil /debris that could not be put to beneficial use at designated site (site should be approved by local authority/MENR) • Identify the disposal site prior to start of construction; site shall be approved by PMF/JSC • Surplus soil/debris shall not be disposed in water courses or along the roads • Asphalt waste from road cutting shall be transported to bitumen plants for reuse, where possible • Maintain a log book for waste soil/debris disposal at the site indicating material, source and quantity	Construction Contractor	Site inspections Log book/records inspection
Impacts due to mining of construction materials	• Procure construction material (sand, gravel, aggregate, etc) only from government approved existing quarry sites • Minimize extraction of construction materials from rivers and stream beds • Maintain a material entry log book at the site indicating material, source and quantity	Construction Contractor	Log book inspection
Soil erosion from	• Avoid scheduling of excavation work during the rainy season	Construction	Site inspections; verify construction

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
excavated/refilled areas and likely impacts on surface water bodies due to construction activities	• In unavoidable circumstances, protect open trenches from entry of rain water by raising earthen bunds with proper compaction • Confine construction area including the material storage (sand and aggregate) so that runoff from upland areas will not enter the site • Construct silt ponds and install silt retention barriers near the site to prevent the entry of silt laden runoff into drains • Ensure that drains are not blocked with excavated soil • Minimize vegetation clearance as far as possible • Minimize the time during which excavations/trenches are open • Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top ; the material shall be refilled in layers and compacted properly layer by layer • Rehabilitate disturbed surfaces as soon as possible after completion of construction activity • No vehicle/equipment repair/maintenance activities shall be conducted on site; if necessary, the works shall be conducted on impervious surface; there shall be no spillage of oils/grease on ground	Contractor	schedule; interviews with people and workers
Collection of groundwater in trenches as their being dung and its disposal This is most unlikely because the water table is deeper than the excavations	• Do not dispose the water directly into the water courses/ drains, which may lead to silting • Create a temporary pond at the site and dewater into pond • Dispose the clarified water from pond into natural courses • Ensure the receiving water body has free flowing course and it will to lead to overflowing or flooding of surroundings	Construction Contractor	Site inspection
Impact on ambient air quality due to dust generation and vehicle emissions	• Cover or damp down by water spray on the excavated mounds of soil to control dust • Apply water prior to leveling or any other earth moving activity to keep the soil moist throughout the process • Bring the material (aggregate and sand) as and when required; • Don't allow access in the work area except workers to limit soil disturbance and prevent access by fencing • Ensure proper consolidation/stabilization of top surface when un-surfaced/ /earthen roads are used for construction activity; sprinkle water on road surface to arrest dust generation • Use tarpaulins to cover loose material that is transported to and from the site by truck Control dust generation while unloading the loose material (particularly aggregate and sand) at the site by sprinkling water or unloading inside barricaded area • Clean wheels and undercarriage of haul trucks prior to leaving construction	Construction Contractor	Site inspections; interviews with people and workers; verify vehicle emission permit records

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	site • Ensure that all equipment & vehicles used for construction activity are in good condition • Ensure that all equipment & vehicles confirms to government emission and noise norms		
Impediment of access to houses and business establishments due to laying of pipelines	• Do not close/obstruct any road/path for construction purpose; if unavoidable alternative temporary access should be made available • Inform local people about the nature and duration of work well in advance so that they can make necessary preparations; • Provide wooden planks across trenches for pedestrians and metal sheets where vehicle access is required	Construction Contractor	Site observations interviews with local people and business
Disturbance/nuisance due to construction activities and public/community safety	• Provide prior public information about nature, schedule of work, and likely disturbances during the construction through local mass media • Intimate the sensitive establishments near the construction site (hospitals/schools/religious places/cemetery/burial ground/parks etc) about the nature and schedule of works; • Schedule noisy activities in consultation and put in place a complaint receiving mechanism • No nighttime construction activities including material haulage near (500 m) any settlement area; sensitivity to noise increases during the nighttime hours in residential neighborhoods – work hours shall be limited to daylight hours 06:00 – 21:00 Hrs • Use less noise generating equipment; inform the local community prior to any noisy works such as cutting of roads using pneumatic drills • Educate drivers: speed limits; avoid use of horn; parking at designated places; no idling on roads etc. • Sites shall be barricaded, guarded and public entry restricted; provide solid barricades where required to stop persons/vehicles falling into the trenches • Provide road signs and flag persons to warn public of dangerous conditions Provide reflective barricades for easy visibility and identification of construction area • The work area including material, waste storage is isolated within the barricaded site	Construction Contractor	Verify construction schedule and records; site observations interviews with workers and local people
Traffic disturbances during	• Identify important roads that are to be affected by construction work and	Construction	Site observations

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
construction along the roads	provide prior intimation to the public • Plan works in important roads in consultation with traffic police and municipality; • Provide information, direction and warning boards, provide traffic guards with danger flags • Provide prior public information about the work, traffic disruptions/diversions • Plan vehicle (material & waste) transport routes & schedules avoiding narrow/sensitive roads and peak traffic timings • Heavy vehicles should not enter narrow local roads and sensitive areas of the town, except in the immediate vicinity of delivery sites • Carry out construction in sections, give adequate notice of construction activities, provide effective road signs, diversions or barricades	Contractor	interviews with local people and traffic police
Occupational Health and Safety of workers	• Provide all workers appropriate personal protection equipment (such as helmet, gum boots, safety belts, gloves, and ear plugs; etc) and ensure their usage • Prohibit unauthorized entry into work site • Provide health and safety orientation training to all workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuries to fellow workers; • Ensure that workers follow documented procedures for all site activities; • Provide qualified first-aid at all times and equipped first-aid stations shall be easily accessible • Provide medical insurance coverage for workers; • Provide supplies of potable drinking water • Ensure the visibility of workers through their use of high visibility vests when working on roads or walking through heavy equipment operating areas; • Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively • Appoint a Environment, Health and Safety (EHS) manager; prepare a construction site layout plan • Document and report work-related accidents	Construction Contractor	Site observations; verify contractor records; interviews with workers; verify accident reports
Risk due to deep excavations, collapse of trench and damage to adjacent structures	• Provide shoring in all trenches/excavations deeper that 1.2 m • Shoring should erected, altered, dismantled only by a competent worker under strict supervision • Excavation and installation shoring should proceed by stages till it reaches	Construction Contractor	Site observations and review of final alignment drawings of sewers

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	the required depth • As far as possible, deep excavations shall not be conducted close to buildings; in unavoidable case provide necessary measuring such as shoring to prevent collapse of fall when the stability of structure may be affected by excavation work		
Safety risk – public and worker, due to existing underground AC sewers	• Existing AC sewers shall be not be disturbed and left as it is in the ground • Mark on inventory drawing and identify on site before start of excavation for new lines and instruct the workers involved in excavation so that they will not accidentally damage the pipes • Ensure proper supervision by a trained person • In the event that AC sewers must be removed in narrow lanes, working with asbestos pipe requires wearing disposable masks and suits, wetting worksites frequently, and using only manual tools for cutting pipes to prevent the formation of high quantities of asbestos particulates in the air. Waste AC pipe must be removed as intact as possible and placed in designated containers in a wet state for appropriate toxic disposal	Construction Contractor	Verify inventory drawings and proposed alignment drawings Site verifications
Impacts due to import of labor and establishment of temporary labor camps	• Avoid/minimize temporary worker camps by employing local people as far as possible • In unavoidable case: o Establish the camp in consultation with the local authority o Camp site shall be located away from water bodies o No clearance of trees vegetation shall be allowed for establishment of camp o Provide appropriate & adequate accommodation o Provide water in good quality & adequate quantity o Provide sufficient and suitable washing facilities including soap & towels o Provide sufficient lavatories; and separate lavatories for men and women workers. o Provide cooking fuel and no worker shall be allowed to cut any tree o Ensure regular and clean maintenance of the camp o Ensure proper wastewater collection & disposal facilities; septic tanks and soak pits shall be provided for wastewater disposal o Provide solid waste collection bins and dispose waste through municipal system; ensure that solid waste is not burnt at the site o Conduct awareness programs on HIV/AIDS and other communicable diseases • Restore camp site to original status after completion of work	Construction Contractor	Site observations;; interviews with workers

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Historical, archeological chance finds during excavation	• Contractor shall put in place a protocol in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve: o Provide training to the construction supervisors to identify any suspicious objects o Stop work immediately to allow further investigation if any finds are suspected; • Call in the state archaeological authority if a find is suspected, and taking any action they require to ensure its removal or protection in situ.	Construction Contractor	Interview with site supervisors; verify construction records for any chance finds detected

Table 8: Environmental Management Plan – Operation

Anticipated Impacts	Proposed Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
<u>Health and Safety</u> • Hazards for AzerSu Workers and the public	• Ongoing training programs for first aid and Occupational Health and Safety training to AzerSu • Undertake periodic inspections of electrical equipment by qualified staff and periodic safety audits	JSC	Monthly inspection of complaints register and safety records Periodic health check up
<u>Sustainability of Infrastructure Systems</u> • Efficiency and reliability of sewerage system	• Provide O&M training for sewer networks; • Provide adequate budgets and undertake planned maintenance programs in accordance with specific O&M plans • Provide vocational training for AzerSu staff • Undertake planned cleaning of town drains and dispose of sludge to designated disposal sites	JSC	Training programs conducted Preventive maintenance activities Time taken for leak repair

Table 9: Environmental Monitoring Plan

Mitigation measures	Parameters to be Monitored	Location	Measurements	Frequency	Responsibility
Pre-Construction Phase					
All design related mitigation measures	Inclusion in the project design	-	Design review	As needed before tendering	PMF
Construction Phase					
All construction related mitigation measures	Implementation on site	All construction sites	Observations on/off site; construction records; review of site layout & safety plan; vehicle log records of construction material and waste transport; interviews with people and workers	Bi-weekly during construction	PMF through supervision consultant
Dust and emission control from construction activities	Ambient air quality (SPM, RSPM, CO, SO2)	Three sampling locations covering subproject area	Comparison with base values	Once before start of construction; quarterly (4 times a year) during construction	Construction Contractor
Noise generation	Ambient noise levels (day, night levels), dB(A)	Three locations as above	Comparison with base values	Once before start of construction; quarterly (4 times a year) during construction	Construction Contractor
Long Term Surveys					
• Influent and effluent wastewater quality at WWTP	As per the government regulations	At the inlet and outlet of WWTP	Comparison with the disposal standards (Appendix 2)	Daily/ monthly/quarterly as required	JSC

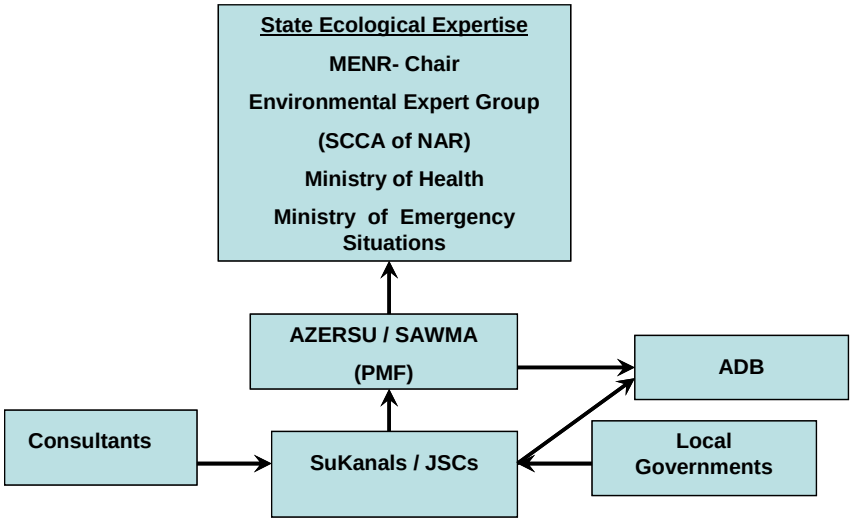
109. **Environmental Reporting.** The contractor will submit monthly progress reports, which include a section on implementation status of environmental management measures. The environmental monitoring and management reports will be prepared by the PMF's Safeguard Specialist with assistance from the Program Consultant. The reports will be submitted biannually to ADB who will disclose it to the public on receipt. The monitoring report will include the following: (i) compliance with ADB loan covenants and government regulations; (ii) significant issues or changes in scope; (iii) summary of monitoring report findings; (iv) required follow-up actions; and (v) conclusions

B. Implementation Arrangements

1. Responsibilities and Authorities

110. Figure 1 provides a schematic representation of the institutional arrangements for implementing the EMP. A summary of the Environmental Assessment and Review Procedures and respective responsibilities are summarized in Table 10. The Program will be implemented by AzerSu's Program Management Facility (PMF) and the agency responsible for operation of improved infrastructure will be Aghjabedi Joint Stock Company. The PMF will provide guidance on environmental issues, and will be the first level of internal monitoring. AzerSu has a significant experience in implementing donor-funded projects, and the necessary technical expertise in monitoring environmental management plans. During the operations phase, the Program will be implemented by the JSC.

Figure 1: Institutional Arrangement



111. The JSC will establish laboratories for chemical analysis and monitoring of water quality at the reservoir sites in each town. Biological and epidemiological monitoring of water will be carried out by the JSC, in accordance with the Ministry of Health, Sanitary Epidemiology Service (SES) and their relevant administrative procedures.

112. The SESs are responsible for health and water quality-related issues. Under the Program, such agreements will be worked out between the JSC and the SESs. The SESs, acting under the approved schedule of the Ministry of Health, will conduct regular tests of water quality, and will be taking supervisory charge in monitoring water quality. Within the town, they will have responsibility to take potable water samples from key locations in the distribution system to ensure compliance with the health regulations. Post-construction and during the operation they will take sewage samples prior to the inflow to the wastewater

treatment plants and also at a discharge point after treatment. The quality of drinking water supply will be monitored according to international and local standards.

113. The overall responsibility for environmental protection lies with the Ministry of Ecology and Natural Resources (MENR). At the rayon level they are represented by the rayon agency, which is located within or near the towns. The MENR is charged with a task of providing national monitoring services that includes a monitoring network of baseline information on water sources. Compliance with the EMP will be undertaken by the Safeguards Specialist at the PMF as part of his/her technical supervisory duties.

114. The responsibility for construction standards is with the Ministry of Emergency Situations. Their standards together with ADB's environmental requirements will be incorporated into the Program design. There are no significant environmental management issues relating to the post construction and operation of the Program. The major ones relate to control of leakage from the sewer lines, the safe discharge of sewage to the sewerage system, the safe operation of the wastewater treatment plants and safe discharge of the treated sewage. Environmental management will be regulated through the existing legislation as well as specific clauses with the Contractor. Daily control and monitoring of construction works will be part of the Contractor's responsibilities.

115. The Program's environmental impacts will be closely monitored. Specifically, the monitoring and evaluation (M&E) activities by the PMU will include (i) collecting, collating, and analyzing monitoring data related to the environmental conditions in the Program towns; (ii) environmental gains as a consequence of Program implementation, and (iii) evaluating environmental impacts within the selected systems. (AzerSu's internal monitoring department is called the Ecology and Monitoring Section.) The M&E activities at the JSC-level will also have site inspectors, who will work with the responsible Rayon agencies. For environmental monitoring, they will collect and analyze information on quality of water supplied, sewage discharged, and minimization of construction impact within the towns. The Program performance, monitoring, and evaluation will be done in accordance with ADB's guidelines on its program performance management system.

116. Existing Town Water User's Association (TWUA) will act as advocacy groups to represent the interests of consumers, and will be recognized by the JSC as important partners in ensuring that WSS services achieve consumer satisfaction.

Table 10: Institutional Responsibilities

Organization		Responsibilities
JSC	JSC, Program Consultant Social and Environ-mental Specialists, and PMF	• Preparing Env. Management Plan (EMP) for SEE review • Periodic submission of environmental monitoring report to ADB for public disclosure • Establishing environmental classifications under ADB regulations & determining need for Subproject (Sp) IEEs • Screening & preparation of Sp EEs including cost estimates for mitigation measures & monitoring plans • Conducting public consultations: Informing affected people and community focus groups before or during consultation in the early stage of IEE preparation and conducting continuing consultation during implementation in accordance with ADB and government requirements • Preparing SpIEEs for SEE and obtaining IEE clearance (development consent approval) from SEE • Submitting to ADB first IEE and all IEEs over $2 million • Ensuring tender documents will be updated with any changes to the EMP • Ensuring contract document including environmental clearance

Organization		Responsibilities
		certificate & conditions and ensuring ADB gets copies of these documents • Implementing and updating environmental mitigation and monitoring measures • Incorporating environmental requirements in civil work contracts • Performing water quality monitoring and reporting to the SEE and local governments • Performing civil work surveys • Ensuring the Contractors have access to the IEE reports • Ensuring that Contractors have fully implemented and completed the detailed EMP and have submitted this to SEE for approval • Providing environmental training • Undertaking remedial action when unexpected environmental impacts occur during implementation • Preparation and submission of quarterly reports to the SEE and ADB including i) compliance with ADB loan covenants and government regulations, ii) significant issues or changes in scope, iii) summary of monitoring report findings, and iv) required follow-up actions • Undertaking monitoring of operation and preparing monitoring reports every year for 4 years after construction
PMF	Safeguards Specialist	• Overall coordination with government entities and supervision responsibilities • Approval of the management contract • Submission of IEEs for SEE approval • Monitoring and evaluation of the Program
Environment Expert Group	SEE (within MENR)	• Review of environmental clearance • Providing guidance for upholding environmental policy requirements
ADB	Social and Environ-mental Sector Specialists	• Reviewing first IEE and all IEEs over $2million • Disclosing reports over ADBs website (Responsibility of ADB Project Leader) • Reviewing all statutory environmental clearances granted by SEE • Reviewing quarterly reports & taking necessary actions • Monitoring EMP implementation and due diligence
Local Govts and TWUAs		• Coordination with JSC and making key decisions on behalf of the community

2. Institutional Assessment

117. AzerSu acting as the PMF has significant experience with managing water and wastewater treatment systems. The organization has accumulated WSS management and mitigation experience through current and completed water and wastewater improvement and construction works throughout the country.

118. Similarly, the Aghjabedi JSC (SuKanal), the local branch of AzerSu has been operating the existing systems for many years. They are experienced with chlorination, distribution systems and wastewater treatment. The Program Consultant's environmental specialist will provide significant support and guidance with the required environment, resettlement and public consultation requirements of ADB and the SEE.

C. Environmental Management Budget and Resources

119. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal construction contract, so there are no additional costs to be included in the EMP. Costs of design-related mitigation measures are included in the budgets for the civil works.

120. The cost for hiring a Program Consultant covering social and environmental issues for the periods before, during and after construction are already included in the project implementation costs . The budget needed for the Safeguard Specialist and support staff has also been included in the Program costs as these employees will come from within the PMF/AzerSu.

121. The ambient air quality monitoring and noise monitoring to be conducted by the contractor during construction will be additional and therefore shown here. Long-term surveys such as raw and treated wastewater quality at WWTP will be conducted by in-house laboratory. So no budget is provided here for this purpose. AzerSu has capacity and knowledge to perform water quality tests. Extensive training must be provided in the subproject due to the risks of construction, chemical handling, and specific wastewater network operations and maintenance tasks. These costs already included in the program part of capacity building.

122. Following Table 11 shows the environmental management costs of this subproject.

Table 11: Environmental Management Costs

Item	Quantity	Unit Cost	Total Cost
Implementation of EMP (1.5 years)		*US $*	*US $*
International Environmental Specialist (Supervision Consultant)	0.25 months	22,000	5,500
National Environmental Specialist (Supervision Consultant)	0.75	6,000	4,500
Environmental Management Specialist (AzerSu-PMF)	0.25 months	3,000	750
Ambient air quality monitoring	3x7	200	4,200
Noise	3x7	70	1,470
Upper Karabagh canal water quality	2x6	200	2,400
Total			*18,820*
Water Quality Monitoring (long-term)			
Influent and effluent waste quality at WWTP	Samples as required	-	
Total			*18,820*

IX. CONCLUSION AND RECOMMENDATION

A. Findings and Recommendation

123. The environmental impacts of the all infrastructure elements proposed in the sewerage subproject in Aghjabedi has been assessed and described in the previous sections of this document. Potential negative impacts were identified in relation to design, location, construction and operation of the improved infrastructure. Mitigation measures have been developed to reduce all negative impacts to acceptable levels.

124. According to this assessment, the proposed Aghjabedi subproject is unlikely to cause any adverse environmental impacts because: (i) proposed subproject activities are designed primarily to improve the quality of life and quality of environment of the town; (ii) potential negative impacts associated with the design, construction and operation of the proposed Project activities will be temporary, minor, and localized in extent and can be mitigated to acceptable levels; (iii) no Project activities will involve permanent or temporary loss of income and/or livelihood; (iv) the institutional framework has been developed to specify the

procedural requirements and responsibilities to ensure environmentally sustainable implementation; and (v) all construction and operation activities will be monitored and reported by the PMF in accordance with the Environmental Monitoring Plan**.**

125. The construction stage Environmental Management Plan (Table 8) and the monitoring to be conducted by the Contractor (Construction phase monitoring indicated in Table 10) should form part of the contract documents. All the measures such as designing a robust treatment system, availability of adequate manpower, O&M equipment and manual, and training is considering in the design of the project. Appropriate compensatory measures are planned through resettlement planning for involuntary resettlement and land acquisition for the proposed WWTP site. These measures will be implemented before the award of civil works contract.

B. Conclusion

126. The level of environmental assessment within this IEE is sufficient to indicate the subproject's impacts and to outline the necessary mitigation measures for the subproject. No additional studies, such as an EIA, are required. The proposed Aghjabedi subproject will have significant positive impacts on the quality of life for community members through improvements to the sewage collection and safe treatment and disposal facility. The proposed Environmental Management and Monitoring Plans in this IEE will ensure that proper water quality monitoring and environmental management is conducted. This IEE was disclosed to the public, and the stakeholder concerns were incorporated into the IEE. The proposed subproject these components will contribute to the overall sustainability of the water supply as well as environmental conditions in Aghjabedi.

127. As per the Law of Environmental Protection 1999, an EIA study and Environmental Permit from MNER is necessary for this subproject. AzerSu is in the process of obtaining this mandatory approval from MNER.

Appendix 1: Photographs

Photo 1: Proposed WWTP site

Photo 2: Existing Dilapidated WWTP

Photo 3: Drainage Channel adjacent to WWTP site

Photo 6: Narrow Roads in the Town

Photo 4: Drainage channel near WWTP site

Photo 7: Wide Roads in the Town

Photo 5: Narrow Streets with utilities

Photo 8: Main Roads with Traffic

Appendix 2: Wastewater Disposal Limits

Maximum Allowable Wastewater Influent and Effluent Levels

Parameter (at rated temperature 15°C)	MAC at entry (mg/l)	MAC at exit (mg/l)
COD (chemical oxygen demand)	620	125
BOD (biological oxygen demand)	375	35
N (general nitrogen)	35	15
P (general phosphorus)	8	2
Suspended matters	310	35

Source: Directive No 91/271/EEC, European Economic Community

Maximum Allowable Concentrations for Water Bodies Used for Fishing

Parameter	MAC (mg/l)
BOD (biological oxygen demand)	3.0
COD (chemical oxygen demand)	20.0
Ammonium (NH_4^+)	0.5
Potassium (K^+)	50.0
Calcium (Ca^{++})	180.0
Magnesium (Mg^{++})	40.0
Sodium (Na^+)	120.0
Nitrate-ion (NO_3^-)	40.0
Sulphate-ion (SO_4^{--})	100.0
Chloride-ion (Cl^-)	300.0
Fluorine-ion (F^-)	0.75
Phosphorus (P)	0.3

European Economic Community Directive (No 91/271/EEC) adopted by Government of Azerbaijan

Appendix 3: National Ambient Air Quality Standards

Pollutants	Maximum allowed concentrations (mg/m^3)	
	Maximal concentration for a given moment	**Average daily concentration**
Carbonic Oxides	3.0	1.0
Sulfur Dioxide (SO_2)	0.5	0.03
Nitrogen Oxides	0.085	0.085
Benzole	1.5	0.8
Fluoride Compounds	0.02	0.005
Phenol	0.01	0.01
Non-toxic Dust	0.5	0.15
Soot	0.15	0.05
Formaldehyde	0.035	0.012
Chlorine	0.1	0.03
Hydrogen Sulfide	0.008	0.008
Nitrobenzene	0.008	0.008
Ammonia	0.2	0.2
Acetone	0.35	0.35
Methanol	1.0	0.5
Ozone (O_3)	0.16	0.03
Hydrocarbon (HC)	1.0	-
Lead and its compounds (except tetraethyl lead)	0.0010	0.0002

Source: Maximum allowable concentrations of toxic elements in the working area GOST 12.1.005-88; Ministry of Ecology and Natural Resources, 2003

Appendix 4: Maximum Allowable Noise Levels

Land use	Noise standard (max) in decibel (dBA)	
	Daytime (07:00-23:00)	**Nighttime (23:00-07:00)**
Residential Areas	40	30
Commercial Areas	55-60	55-60
Hotels and dormitories	45	35
Industrial areas: a) highly qualified workplaces	50	50
b) permanent workplaces within territory or buildings of plants	80	80
c) workplaces of track drivers and service	70	70
d) workplaces of drivers and service for tractors and other equivalent agricultural and melioration mechanisms	80	80
Sensitive areas: a) hospitals and sanatoriums	35	25
b) schools, libraries and conference halls	40	40

Source: Noise Standards GOST 12.1.003-83 UDK 534.835.46:658.382.3:006.354; GOST 12.1.036-81 ST SEV 2834-80

Appendix 5: Rapid Environmental Assessment (REA)Checklists

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: AZE: Water Supply and sanitation Investment Programme-Sewerage in Aghjabedi Town T3

Sector Division: CWUW

Screening Questions	Yes	No	Remarks
B. PROJECT SITING IS THE PROJECT AREA…			
▪ DENSELY POPULATED?		x	
▪ HEAVY WITH DEVELOPMENT ACTIVITIES?		**x**	
▪ ADJACENT TO OR WITHIN ANY ENVIRONMENTALLY SENSITIVE AREAS?		**x**	
• CULTURAL HERITAGE SITE		x	
• PROTECTED AREA		x	Ag-gol National Part is located about 5 km east of the town. No components are located near the town. It is proposed to dispose the treated water from WWTP in to a drainage channel flowing adjacent to the site. This channel joins a major canal, 2.5 m from the WWTP site. This major canal flows further downstream, 12 km, and feeds Ag-gol lake in the national park. No impacts envisaged.
• WETLAND		x	
• MANGROVE		**x**	
• ESTUARINE		x	
• BUFFER ZONE OF PROTECTED AREA		**x**	
• SPECIAL AREA FOR PROTECTING BIODIVERSITY		**x**	

Screening Questions	Yes	No	Remarks
• BAY		x	
A. POTENTIAL ENVIRONMENTAL IMPACTS WILL THE PROJECT CAUSE…			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?		x	
▪ interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?		x	
▪ dislocation or involuntary resettlement of people?	x		Proposed WWTP site is privately owned. The compensatory measures planned through resettlement planning process as per ADB SPS 2009 will be followed in relocation.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	
▪ impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		X	Waste water will be treated to European standards(adopted by Government of Azerbaijan) before being discharged
▪ overflows and flooding of neighboring properties with raw sewage?		X	Sewage collection and transmission facilities are planned considering the peak factor
▪ environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?		X	-
▪ noise and vibration due to blasting and other civil works?		X	Expected during construction period from of excavation of trenches on existing roads. Necessary protection measures will be planned. Involved so blasting. The breaking of road surface will be carried out using hand held pneumatic drill.
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical,and biological hazards during project construction and operation?		X	
▪ discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		X	
▪ inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		X	
▪ road blocking and temporary flooding due to land excavation during the rainy season?		X	
▪ noise and dust from construction activities?	x		Limited to the construction phase, mitigated through appropriate mitigation measures
▪ traffic disturbances due to construction material transport and wastes?		X	The area is not inhabited and is far from the town

Screening Questions	Yes	No	Remarks
▪ temporary silt runoff due to construction?	X		Appropriate measures planned
▪ hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?		X	
▪ deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		X	Appropriate sludge treatment and disposal methods to be followed
▪ contamination of surface and ground waters due to sludge disposal on land?		X	
▪ health and safety hazards to workers from toxic gases and hazardous materials which maybe contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unstabilized sludge?		X	Appropriate safety and personal protection equipment (PPE) to be provided
▪ large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		X	
▪ social conflicts between construction workers from other areas and community workers?		x	
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		x	
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		x	

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Remarks
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?		x	
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		x	
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		x	

▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?		**x**	