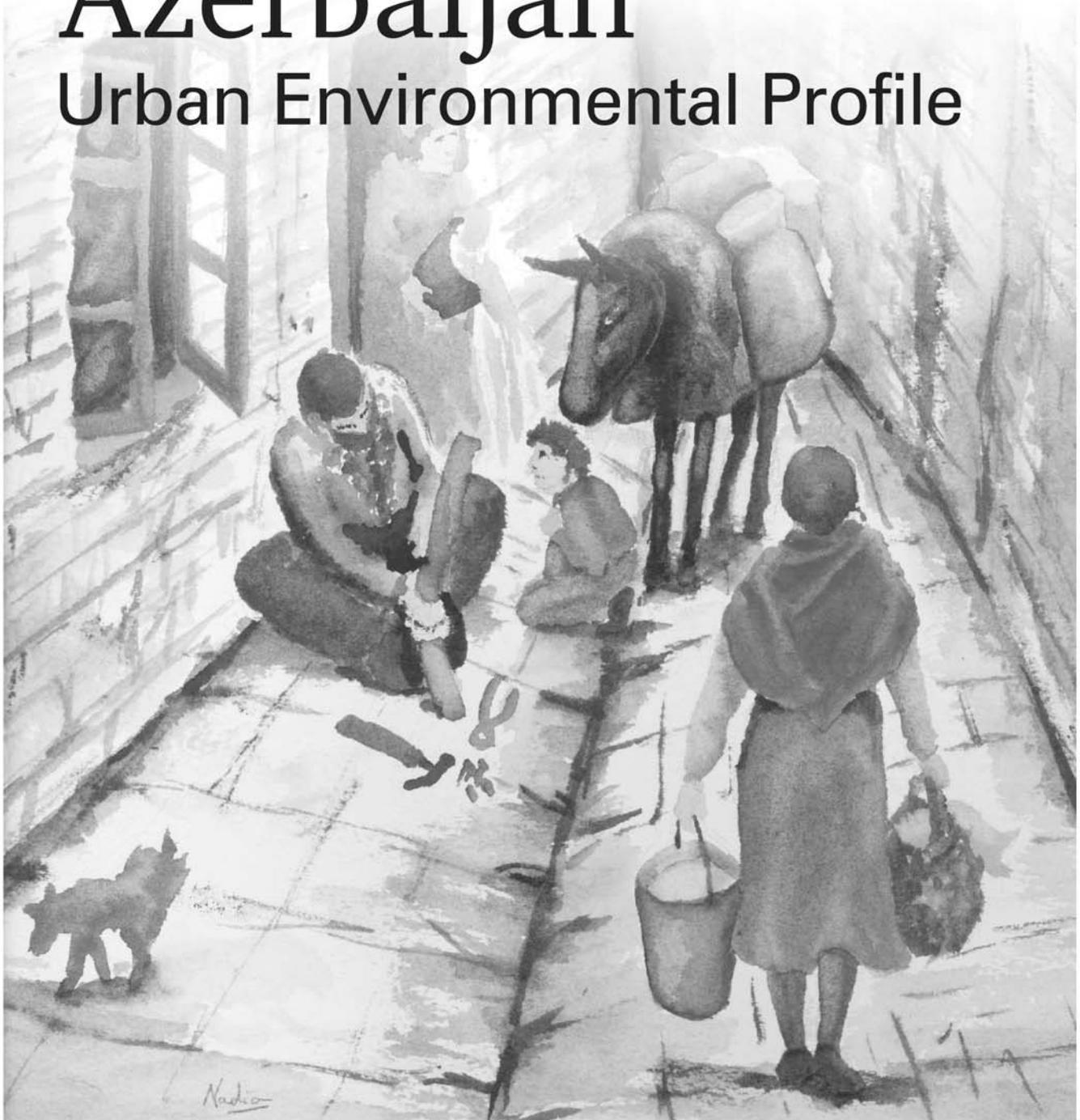


# Azerbaijan

## Urban Environmental Profile



Asian Development Bank

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## **FOREWORD**

This report describes and evaluates urban environmental issues in Azerbaijan. It was developed from the end of 2003 to 2004 from various sources of data, and the findings were discussed with the Ministry of Environment and Natural Resources, regional environmental nongovernment organizations, and bilateral assistance agencies active in urban environmental issues during the contact mission held on 19–26 January 2004. The mission confirmed the preliminary findings, discussed government priorities, and collected remaining data.

While there is consensus on the scope and extent of urban environmental pollution in Azerbaijan, various sources surveyed provided often contradictory statistics. This report has aggregated some data and new data have been developed during its preparation, such as on access to urban water and sanitation services. The information provided should be treated only as indicative for the purpose of comparison.

An analysis was made of major ongoing developments and initiatives related to urban environment. The conclusions and findings of the report are recommended for the consideration of the Azerbaijan Country Team and the ongoing country strategy and program and its update process.

## ABBREVIATIONS

ADB	–	Asian Development Bank
ARWC	–	Apsheron Regional Water Company
CO	–	carbon monoxide
CO <sub>2</sub>	–	carbon dioxide
EIA	–	environmental impact assessment
ERBD	–	European Bank for Reconstruction and Development
EU	–	European Union
FSU	–	former Soviet Union
GDP	–	gross domestic product
GEF	–	Global Environment Facility
GOST	–	Gosudarstveniy Standart (surface water quality standard)
HMS	–	hydrometeorological station
IDP	–	internally displaced person
IMF	–	International Monetary Fund
MENR	–	Ministry for Ecology and Natural Resources
MOED	–	Ministry of Economic Development
MOH	–	Ministry of Health
MPC	–	maximum permissible concentration
NPESSED	–	National Program for Environmentally Sustainable Socio-Economic Development
NEAP	–	National Environment Action Plan
NEHAP	–	National Environmental Health Action Plan
NGO	–	nongovernment organization
NO <sub>x</sub>	–	nitrogen oxides
SCE	–	State Committee of Ecology and Control of Natural Resource Utilization
SO <sub>2</sub>	–	sulfur dioxide
SPPRED	–	State Program on Poverty Reduction and Economic Development
TACIS	–	Technical Assistance for the Commonwealth of Independent States
UNDP	–	United Nations Development Programme
US	–	United States
USAID	–	United States Agency for International Development
WHO	–	World Health Organization

## WEIGHTS AND MEASURES

g/kg	–	gram per kilogram
km	–	kilometer
km <sup>2</sup>	–	square kilometer
l	–	liter
m	–	meter
mg	–	milligram
mg/l	–	milligram per liter
mm	–	millimeter
µg/m <sup>3</sup>	–	microgram per cubic meter

## NOTE

In this report, "\$" refers to US dollars

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## EXECUTIVE SUMMARY

1. The Azerbaijan Republic occupies a territory of 86,000 square kilometers on the western side of the Caspian Sea. In 2001, the country's population was 8.1 million, of which 51–57%, depending on the source, formed the urban population. The latest poverty indicators show that 68% of the population are considered poor. Urban poverty rates are reported to be as high or higher than rural poverty rates.

2. Azerbaijan has the reputation of being an environmental disaster zone. Many scientists consider the Apsheron Peninsula, where 50% of Azerbaijanis live, to be the most ecologically devastated area in the world because of severe air, water, and soil pollution. High economic and social costs are imposed on the urban poor by severe environmental pollution and the bad condition of social and environmental infrastructure. The country's urban areas face numerous environmental problems related to polluted water, air, and soil. The main causes are unchecked industrial and municipal polluting activities; lack of adequate water, wastewater, clean air, and waste management; historic dependency of the economy on oil exploitation, often carried out in an environmentally unsustainable way; and the varying level of the Caspian Sea. Inadequate management of social and environmental infrastructure in urban centers causes shortages of drinking water in major cities, including Baku; pollution of water basins and the Caspian Sea by untreated or inadequately treated discharges of wastewater; pollution of air by toxic wastes; and inadequate collection, storage, and disposal of solid municipal, industrial, hazardous, and toxic waste.

### **A. Economic Development and the State of the Environment**

3. Fueled by exploitation of rich oil and gas resources, economic development is concentrated mainly in the coastal areas. Prior to the collapse of the former Soviet Union (FSU), the economy was based on heavy industry, and oil and gas development, mainly in the Apsheron Peninsula. The cities of Baku (the capital) and Sumgayit, located in the peninsula, have large petrochemical, chemical, and metallurgical industrial sites. Industrial development and mobile sources of fuel combustion have released high concentrations of heavy metals and other toxic and hazardous elements into air, land, and water. Decades of environmentally unsustainable oil production have left behind vast wastelands with standing oil ponds and severely contaminated soil. Scant consideration to the environment was given during urban development. Urban areas, such as Baku and Sumgayit, became classic examples of environmental hot spots. The Caspian Sea is highly polluted and there is danger that, with rising sea level, further pollution will result from inundating oil-polluted lands. Serious pollution of the urban environment is responsible for human health concerns and is a threat to the quality of life.

4. Overall, the transition period has been a mixed blessing for the environment. Since the collapse of the FSU, economic output has declined dramatically, particularly due to the demise of the inter-republican market, the war with Armenia, disruption of transport links to the north, and a slow economic reform process. Heavy industry was especially hard hit. Although the economy began to grow again in 1996, most large industrial sites are still shut down or operate at a fraction of capacity. The decline in industrial and agricultural output has significantly reduced air pollution, industrial water discharges, and pollution from agrochemicals. The country achieved significant progress in updating its environmental legislation, but environmental management and enforcement capacities have significantly deteriorated. The present accumulation of toxic industrial waste, heavy metals, pesticide residues, and oil pollution represents substantial and unresolved environmental problems. Accumulation of pollution from oil fields, refineries, and power plants still continues at high rates. Vehicle emissions significantly

increased over the last decade and became a leading source of unchecked air pollution. The new Baku-Ceyhan pipeline is expected to be completed soon and this will increase air pollution levels from increased oil production if no action is taken to modernize the oil industry.

## **B. Water Resources and Wastewater Management**

5. Water resources in Azerbaijan are limited. Piped drinking water reaches 50–95% of the urban population, depending on the source of information, and most agree that safe drinking water is available to less than 50% of urban residents, with some areas experiencing acute shortages of drinking water and that of substandard quality. Azerbaijan is almost entirely reliant on the Kur-Araz river basin for all types of water uses, including municipal water. Problems in the basin concern both quantity and quality of water. The neighboring countries of Georgia and Armenia heavily pollute the Kur River and its tributaries. Municipal sewage containing more than 40,000 tons of nutrients is released into the Kur and Araz rivers each year before crossing the border. Upstream copper-molybdenum plants discharge hundreds of tons of strong acids and heavy metals, including copper, lead, molybdenum, and Iron. Untreated, local industrial, municipal, and nonpoint source discharges contribute to the build-up of pollution. Surface water and groundwater are polluted from oil spillage and leakage from pipelines and storage tanks, resulting in contamination by petroleum hydrocarbons, heavy metals, and possibly radiation; run-off laced with large quantities of fertilizers and pesticides from agriculture; salinization of the water table due to a rise in the Caspian Sea and seawater intrusion; and factory wastes dumped into rivers. The conditions of water supply, wastewater collection networks, and wastewater treatment facilities are appalling. Pipes are rusted and equipment is obsolete and broken because of inadequate maintenance and repairs for more than a decade. As a result, piped water supplies from surface water sources are often unsafe and unreliable. Fully aware of this, the Government is motivated to improve the access of the urban population to a clean water supply and safe sanitation. With the pronounced shortage of safe surface water sources, underground water resources that currently make up about 25% of the river flow are considered as a promising future potential source. As yet, no definitive course of action, such as development of sustainable rates of groundwater extraction and measures to protect groundwater quality and quantity from unregulated development, has been taken. There is no capacity for enforcement of appropriate wastewater management, including industrial pretreatment.

6. Water management is based on administrative units rather than river basins. Although the creation of the Ministry of Ecology and Natural Resources (MENR) has provided a clear management structure in the water sector, overlapping functions and responsibilities remain. The level of cooperation between MENR and other agencies, particularly on exchange of information, still needs improvement, in part due to the lack of legally binding data exchange requirements.

7. The Water Code adopted in 1998 sets the basis for water management in Azerbaijan and gives four main principles for use and protection: (i) economic development and environmental protection; (ii) provision of quality water to the population; (iii) water management based on river basins; and (iv) water protection functions separate from water use and water industry functions. However, meeting these objectives poses a big challenge. Because the state of public financing is very poor, most water-related agencies lack financial and technical resources to implement their policies and enforce existing laws. The preparation of a national integrated water use and water protection strategy should be given top priority. The strategy should be based on an integrated river basin management approach rather than administrative units, remove overlapping functions and responsibilities between responsible agencies and, to

the extent possible, promote coordination among the countries in the main river basin. In order to achieve improvements in water resources and wastewater management there is need for leadership in international assistance. It is suggested that the proposed Asian Development Bank (ADB) Urban Water Supply and Sanitation Project covering three towns could be supported by longer-term ADB involvement in the sector.

### **C. Air Pollution**

8. Industrialization and urbanization over the past 30 years have resulted in significant deterioration of ambient air quality in urban areas. Large cities in Azerbaijan were already considered unsafe for human health during the late FSU period. There are five cities that produce 96% of the atmospheric pollution emissions: Sumgayit, Baku, Ganja, Ali-Bayramli, and Mingchevir, with most of the industrial air emissions concentrated in Baku and Sumgayit. The reduction in industrial activity over the last decade caused a reduction in annual emissions of most pollutants, which was offset to a degree by an increase in mobile sources of air emissions. The current primary source of atmospheric pollution from stationary sources is the release of associated gasses by petrochemical plants, oil refineries, and factories, especially in Sumgayit and Baku; venting of natural gas from oil wells; and burning of untreated garbage. Although gross emissions are lower, current per-unit industrial emissions are believed to be higher than in the 1980s because existing production and pollution control technologies have not been maintained for over a decade, are out-of-date, and are inefficient.

9. Within the last decade, the country witnessed a dramatic increase in numbers of old vehicles (10 years or older) that are poorly maintained and use low-quality fuel. The current problems of vehicle emissions are more related to high emissions per vehicle rather than the number of vehicles. Other factors contributing to increased vehicle emissions are the poor system of vehicle inspection/maintenance, heavy traffic, poor road conditions, and lack of bypasses in most cities. The issue of indoor air quality is becoming more pronounced because the urban population is increasingly using domestic heaters with alternative fuels and without safe fuel combustion devices. A drastic decline in data collection due to lack of financial resources and technical equipment prevents measurement of all substances of concern, and there is no assurance that those that are measured are measured properly.

10. The other concern voiced is that projected economic growth will add to the deterioration of urban air quality; pollution control equipment, both at stationary and mobile sources, is obsolete and has physically deteriorated.

### **D. Solid Waste Management**

11. Management of solid, hazardous, and toxic waste is grossly inadequate. Rates of waste generation are virtually unknown and waste is disposed of without due consideration of environmental issues. Municipal wastes are dumped together with hazardous wastes. Landfills are not properly planned. Modern waste management techniques and relevant legislation are badly needed, while institutional capacities and public awareness need raising. Also needed are waste inventory systems; market-based tools for waste management; cleaner technologies; capacity for controlling illegal trade in and import-export of wastes; and regional cooperation and transparency in waste management. Positive changes are, however, taking place to improve the situation. The Hazardous Waste Management Agency was established within MENR in 2003, and a draft national hazardous waste strategy has since been developed, with the help of the World Bank. The strategy is in the process of review and adoption by the Government. While the Government realizes the urgency of needs and assigns high priority to a hazardous waste

management strategy, continuing international assistance might be essential to improve the situation.

12. The cleanup of contaminated urban soil, particularly the areas around industrial sites, will be extremely expensive. It will be particularly difficult to find appropriate technical solutions and practical implementation schemes for the cleanup and restoration of metal-contaminated soils.

13. MENR is the lead agency in the environmental field. It was created in 2001, the result of combining several existing agencies. It is continuously strengthening its position and credibility in this role. MENR's mandate still overlaps that of other central government agencies that create tensions. However, the role of the Ministry of Health (MOH) and others in the environmental field is expected to diminish further. The scope of problems that MENR is tasked to solve is massive. Led by an energetic leader, it has a dedicated but unevenly experienced staff that needs more exposure to international experience. MENR is still in the process of optimizing its organizational structure.

14. Azerbaijan has made impressive progress in the development of its environmental legal framework. However, this remains largely ineffective because it is generally not supported by implementation and contains duplication of functions. It has been mainly developed with little funding for technical expert review/development of existing norms and standards, using limited legal references available locally. Both MENR and MOH were involved in developing the legal framework and the existing laws, regulations, and environmental standards often treat the impacts on environment and human health separately, as espoused by the two ministries. Health laws that preceded the ecological laws need to be updated. Monitoring procedures, currently underfunded and inefficient, need critical appraisal, particularly with regard to duplication of monitoring functions.

## **E. Responses to Environmental Challenges**

15. Underlying the urgency in addressing the environmental concerns, the Government endorsed the National Environmental Action Plan (NEAP), prepared with assistance from the World Bank. While NEAP is comprehensive in identifying the environmental issues and causes, it has not become a guiding document for all domestic and international stakeholders, such as international financing institutions and external assistance agencies, and most of the work identified was carried out by the World Bank itself. Secondly, NEAP did not address the duality of health versus ecological impacts, and was prepared mostly on the basis of the latter. The National Environmental Health Action Plan (NEHAP), prepared by the MOH in 2001, specifies concerns about the urban environment from the point of view of impacts on health. However, the level of government commitment to NEHAP is unclear. Further, it is not clear to what extent the health and quality of life of the population, particularly those of the poor in both urban and rural areas, have been considered. There is clearly a need to improve the living conditions of those with the worst living standards and vulnerable groups, such as refugees and internally displaced persons (IDPs).

16. Nevertheless, Azerbaijan has embarked on a path of sustainable environmental development in recent years, with efforts stepped up since the creation of MENR. In line with the base strategic document of the Government, the State Program on Poverty Reduction and Economic Development for 2003–2005, and in coordination with the other state stakeholders, MENR prepared the National Program on Environmentally Sustainable Socioeconomic Development (NPESSED) for 2003–2010, approved by the President of Azerbaijan in 2003.

NPESSD calls for increased coordination of activities in the area of environmental protection and identifies urgent environmental problems, most of which are concerned with urban development: lack of drinking water in Baku and other cities, inadequate quality of drinking water outside Baku, inadequate wastewater management, excessive discharge of air emissions, and failure to ensure effective industrial and municipal solid waste management. To develop/promote NPESSD in further detail, MENR created two interministerial working groups in late January 2004, on water supply and wastewater; and municipal waste. The Ministry of Economic Development (MOED) recently prepared the Five-year Plan for Socioeconomic Development of Regions of Azerbaijan for 2004–2008 that specified a number of urban environmental initiatives, particularly in the areas of water supply and wastewater management, in a number of cities and towns.

17. While these are positive developments, immediate action on the environmental initiatives is not expected without support from the international community. In 2003, MOED embarked on a program of reform of municipal utilities, including decentralization and related institutional reform, and a gradual increase in tariffs. However, no changes to water and/or electricity tariffs were introduced in 2003. MOED is currently developing the country's 2004–2008 development plan that includes, inter alia, improvements of water and wastewater conditions.

18. The World Health Organization currently supports the preparation of the European Plan of Actions for Environmental Protection and Children's Health (EPAEPCH). Azerbaijan is expected to approve EPAEPCH, which will oblige the country to improve its management of water, wastewater, solid waste, and air quality, including actions on harmonization of standards and legal frameworks. Within the framework of EPAEPCH, Azerbaijan plans to promote the settlement of regional conflicts, including actions to improve living conditions of IDPs. At the request of Azerbaijan, the United Nations Economic Council for Europe prepared, in early 2004, a comprehensive draft Environmental Performance Review and submitted it to MENR for comments/approval. The World Bank is preparing a second generation of NEAP, which should further promote the readiness of the Government to address the country's environmental concerns.

19. While improving the management of water supply, wastewater, and solid waste is an urgent priority, there is a lack of overall leadership in international assistance in these areas. The Minister of MENR has expressed interest in collaborating with ADB and indicated the following priorities for ADB-supported loan/technical assistance projects: (i) land oil pollution cleanup on the Apsheron Peninsula, (ii) improvements in solid waste collection and disposal, and (iii) improvements in urban drinking water and wastewater collection and treatment. While the World Bank is planning to assist in the Apsheron cleanup, ADB is also invited because the scope of work allows more than one agency.

20. The expectation of the Government and the international community is that by mid-2005, oil revenues will significantly increase. The European Bank for Reconstruction and Development will then no longer focus on natural resource development, but rather on economic infrastructure, and attend to corporate governance and revenue management.

## **F. Potential for ADB Assistance**

21. The economic distress experienced by Azerbaijan since 1991 has made it difficult to allocate appropriate levels of environmental financing. The international community, including international financing institutions and bilateral agencies, has actively assisted the Government in addressing and curbing environmental deterioration. However, much more has to be done.

The appalling conditions of the urban environment, the scope of needs, and the importance of pursuing environmental improvements made the urban environmental agenda steadily rise in prominence. The expected oil revenues and increased international pressure to act on environmental issues, including international obligations that the Government has adopted, are raising the potential of international assistance to the urban environmental sector. Besides being important and visible internationally, most urban environmental issues could be successfully solved at the country level, not requiring regional cooperation that is still difficult due to political tensions with Armenia. There is need for leadership in international assistance to respond to the urgent needs of improved water supply, wastewater, and solid waste management—a role that ADB may consider playing. Another area identified for assistance is road/traffic management.

22. The development of NPESSED and other recent initiatives of MENR coincided with the election of a new president of Azerbaijan, after the nearly decade-long leadership of the previous president, Mr. Heydar Aliyev. The new presidential administration shows interest in environmentally sustainable development. One of the first decrees of the new president calls for studying the course of “ecologically stable social-economic development in the Republic of Azerbaijan.” The same decree calls for purposeful work in the sphere of further expanding the country's cooperation with international and regional financial and economic structures.

23. There is risk in that, while the Azerbaijani Government fully acknowledges its environmental problems and the Soviet legacy of exploitation of natural resources and neglect of Azerbaijan's infrastructure, it is less explicit on the pace of economic reform and of building a democratic society, issues that might be restraining the speed of urban environmental improvement. Another restraining issue is the high level of corruption, making it unclear whether adoption of a free-market economy will help or hinder Azerbaijan in overcoming its legacy of Soviet and post-Soviet pollution.

24. Discussions during the preparation of this report confirmed the importance of continuing current ADB efforts in the areas of urban water supply and wastewater, and identified the immediate potential for future loan/technical assistance projects in (i) solid waste management and (ii) land reclamation in the Apsheron Peninsula. Addressing urban environmental issues successfully requires carrying out sufficient policy dialogue. The critical areas requiring technical assistance are (i) resolving the remaining overlap in responsibilities between central ministries and agencies; (ii) strengthening legal and regulatory frameworks and related technical support; and (iii) building the capacity of MENR, including promoting its cooperation with other transitional Central Asian countries experiencing similar problems.

## I. COUNTRY DESCRIPTION

### A. Geography and Topography

1. The Azerbaijan Republic occupies the southeastern Caucasus Mountains. Its territory includes the southeastern part of the Greater Caucasus and a part of the Lesser Caucasus, the Talish Mountains, and the Kur-Araz lowlands as well as some small islands on the western coast of the Caspian Sea. The average altitude of the country is 384 meters (m) above sea level, varying from a maximum of 4,466 m above sea level (Mount Bazar-Duzi) to a minimum of 27 m below sea level on the Caspian Sea coast—18% of the territory is below sea level. Valleys and lowlands occupy 39%, hills (up to 2,500 m) 39.5%, and mountains (above 2,500 m) 3.5% of the territory. The region is seismically active, with frequent earthquakes, and is subject to floods.

### B. Climate

2. There are several marked climatic zones, depending on altitude and distance from the Caspian Sea: dry subtropical, wet subtropical, temperate, and alpine. Dry subtropical climate is typical in the Kur-Araz lowlands and Apsheron Peninsula. A wet subtropical climate is found in the south Talish mountains, and in the foothills and the Lankaran lowlands. The temperate climate dominates the mountain slopes of the Greater and Lesser Caucasus, covered by forests, and is divided into dry, warm dry, warm wet, and cool zones. The high mountain ridges and the mountain peaks of the Greater and Lesser Caucasus have alpine and subalpine environments. The average annual temperature varies from 14° Centigrade (C) in the lowlands to below 0°C in the highlands. The average temperature for July in the lowlands is 26°C and in the highlands 5°C. The absolute maximum and minimum temperatures are 43°C and minus 30°C, respectively. The prevailing winds are northerly (Apsheron Peninsula), northwesterly/southwesterly (Kur-Araz lowlands), and westerly (Lankaran depression). Annual rainfall varies from less than 200 millimeters (mm) on the southern coast of the Apsheron Peninsula to 300–900 mm in the foothills and mountains, to 1,000–1,300 mm on the southern slope of the Greater Caucasus, and 1,200–1,400 mm in Lankaran.

### C. Vegetation

3. Azerbaijan is rich in flora, with 4,300 species of flowering and nonflowering plants comprising 125 families and 920 genera (of the Caucuses total of 156 plant families and 1,286 genera). However, the forests cover only about 11% of the country and are not distributed evenly within the country. In the Greater Caucasus, forests occupy 49% of the land, in the Lesser Caucasus 34%, in Talish Mountains 15%, in the Kur-Araz lowlands 2.5%, and in Nakhchivan, 0.5%.

4. During recent years, there has been a rapid decrease in natural gas supply and a lack of other types of fuel (bituminous coal, kerosene, and others), causing fuel shortages for more than 65% of the total population. Consequently, the use of timber for heating living spaces has increased by a factor of four, with associated deforestation.

### D. Fauna

5. There are approximately 18,000 animal species in Azerbaijan, including some 14,000 insects, more than 1,100 arachnids, and more than 600 vertebrates. Of the vertebrates, 14 species of mammals, 36 birds, 13 amphibians and reptiles, 5 fishes, and 40 insects were listed as endangered in 1990. The Caspian Sea coast is a key north-south migratory corridor for

mammals, as well as an important destination area for over wintering, breeding, and nesting of birds. It has unique aquatic fauna, in particular fish.

6. With the reduction of habitat areas and an increase in anthropogenic pressure, the abundance and variety of fauna are likely to be being depleted.

#### **E. Population**

7. The population grew steadily until 1990. Since then, migration processes and refugee flows from conflict zones have played an important role in population dynamics and have led to a more mono-ethnic society. The country has more than 1 million internal and external refugees.

8. Of the total population of 8.1 million, more than 50% live in cities. About 1 million are unemployed.

#### **F. Social Conditions**

9. Although Azerbaijan does not have slums, the armed conflict with Armenia has resulted in more than 1 million refugees and internally displaced persons (IDPs). While poverty in Azerbaijan cannot be explained solely by this problem, refugees and IDPs are the country's most vulnerable groups. They have poor living standards, low income and employment levels, and high health risks. The Government plans to increase the average dwelling space per family and to improve their living conditions. However, despite measures undertaken so far by the Government and international humanitarian organizations, their living conditions are still appalling.

10. According to a household budget survey conducted in 2001, 49% of Azerbaijan's population live in poverty. The survey results show that the urban population has consistently higher poverty rates than the rural population. The higher risk of urban poverty can be attributed to the lack of land ownership and ability of households to produce their own food or maintain livestock. Poverty and vulnerability are closely linked to environmental problems, such as polluted air and drinking water, leading to increased health risks. Clean water is becoming a privilege of the rich, who can afford filters and bottled water. The survey data do not give any clear indication of regional differences in living standards. Poverty appears to be spread quite broadly over the country. Baku and the Apsheron Peninsula have better infrastructure and services than other regions, but a large section of the urban poor population is also situated there.

11. According to government data, the registered unemployment rate in 2001 was 1.2%. In 2003, according to the National Program for Environmentally Sustainable Socio-Economic Development (NPESSED), the unemployment rate was 27%, including a high level of unregistered unemployment. Rural employment rates are slightly better than those in urban area, due to the agricultural employment opportunities promoted by land reform. Employment among young educated people with secondary special and vocational education is higher than among the less young and less educated. Reduction of the high unemployment rate is one of the Government's priorities.

12. Social assistance benefits consist of child benefits for low-income families, childbirth allowances, and childcare allowances. Other types of social assistance include food allowances for IDPs and allowances paid to pensioners, orphans of victims of military conflict, and the disabled. Overall the system of social assistance is poorly targeted and lacks transparency.

## **G. Economy and Industrial Development**

13. The oil and gas industries are the basis of the economy. Since World War II, the republic not only fully provided itself with oil and oil products but also supplied the majority of oil and oil products to other republics of the former Soviet Union. Azerbaijan's sharp economic decline in the first half of the 1990s has reversed and the economy has been growing since 1996. The economic recovery has been uneven and is mostly attributable to strong investment activity in the oil and oil-related sectors. Azerbaijan's real gross domestic product (GDP) grew by 10.6% in 2002 (see Appendix 1 for structure of the GDP in 1998–2002), and remained strong in the first half of 2003, as foreign investors pushed ahead with major projects in the oil industry and oil prices remained high. However, even with the \$3.7 billion invested in the country's oil sector since 1994, Azerbaijan is currently a relatively insignificant oil and gas producer, although major increases are expected to begin in 2005.

14. Responding to local markets and locally available raw materials, the major production activities have shifted from heavy industry and chemicals to oil and gas operations, mining, cement manufacturing, and food processing. The burdens of a transition economy remain and economic reform has been uneven over time and across various reform dimensions. While marked headway has been made in some areas, such as fiscal and energy sector reforms, progress in other key areas, such as restructuring and privatization of large state-owned enterprises, has been limited. With all state-owned industries other than the oil industry nearly defunct, the fastest growing segment of the economy has been small and medium-sized enterprises. However, limited credit access and rampant corruption have hampered their growth. The Government's reluctance to proceed fast with regulatory reform and privatization of state property has resulted in a "wait and see" approach by potential investors.

## **H. Environmental Conditions**

15. Environmental deterioration is widespread in Azerbaijan. The country faces numerous problems related to air and water quality, land and biodiversity, lowering levels of the Caspian Sea, outdated and polluting industries, and oil field spills (Appendix 2). The Government recognizes the need to address environmental problems to sustain economic development and poverty reduction efforts. Much remains to be done to improve the country's environment, particularly in urban areas.

## **II. KEY ENVIRONMENTAL MANAGEMENT ISSUES**

### **A. Water Resources and Urban Water Supply**

#### **1. Availability**

16. Azerbaijan has limited water resources (Box 1). The country is in last place among neighboring countries in terms of water resources per capita and per unit area.<sup>1</sup> Only 30% of river flow resources are formed within the country. Areas with least water resources per capita and per unit area, in order of concern, are the Mugan Salyan region, Apsheron Peninsula, Kur-Araz lowlands, Mill Karabakh region, Kazakh region, and Nakhchivan.

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<sup>1</sup> According to Government estimates, the total annual flow of Azerbaijan's rivers on average (50% of provision) is 29.7 billion cubic meters (m<sup>3</sup>). In moderately and extremely arid years (75% and 95% of provision), the flow decreases to 25.5 and 20.7 billion m<sup>3</sup>, respectively.

**Box 1: Water-Use Balance**

The annual intake of freshwater in Azerbaijan is 16 billion cubic meters (m<sup>3</sup>). About 1.2 billion m<sup>3</sup> are drawn from underground sources, of which there are more than 20 inland water reservoirs on the Apsheron Peninsula alone. Total water consumption is 11–13 billion m<sup>3</sup>; 30% is used for industrial and domestic purposes. The average per capita consumption of drinking water is about 130 liters per day, relatively low by international standards. Discharges to receiving water bodies make up about 5 billion m<sup>3</sup>, including “fully treated,” partially treated, and raw wastewater. Most industries use “once-through” water systems; only a few industries reuse water, which is typical throughout the region.

## 2. Kur-Araz River Basin

17. The major river basin in Azerbaijan is the Kur-Araz. It includes the country’s two major rivers: the Kur and the Araz and their tributaries. The total catchment area of the basin is more than 290,000 square kilometers (km<sup>2</sup>), of which about 188,000 km<sup>2</sup> is for the 1,500-km long Kur River and 102,000 km<sup>2</sup> is for the 1,100-km Araz River. The basin spans several countries—Armenia, Azerbaijan, Georgia, and parts of Turkey and Iran—and is rich in biodiversity, hosting unique riparian forests along the Kur and many important wetlands.

18. The Kur River originates in northeastern Turkey, passes through Georgia and flows into the Caspian Sea in Azerbaijan. Some of its tributaries flow from Armenia to Georgia and Azerbaijan. According to its slopes and geomorphology, the Kur is divided into three areas: upper—from its source to the Borjom ravine inclusive (Georgia), middle—from the ravine to the mouth of the Alazani River, and lower—from the Alazani River (from the Mingechevir duct entrance) to the Kur mouth. The Kur River has very low banks, which are mainly formed by its own alluvia. Being a typical mountainous river in its upper reaches, the Kur River causes considerable erosion and carries in its waters a great amount of suspended material, from coarse pebbles to fine sands, which give water a typical chocolate-grey and grey color. The river flow is regulated by a cascade of dams (Shamhkor, Mingechevir), where most of the alluvia accumulates.

19. The Araz River is the main tributary of the Kur River, originating in eastern Turkey and flowing along the border of Turkey, Armenia, Iran, and Azerbaijan. One branch flows directly into the Caspian Sea. The Araz River starts in the uplands and flows in narrow ravines before reaching the plains. At some points, the banks of the river rise to a height of 50 m or more. It is one of the most turbid rivers in the world. On average, it carries 2.5 grams of suspended particles per liter, more than that in the Nile. Together, the Araz and Kur bear and discharge about 45 million tons of suspended matter annually. Araz River water contains a high amount of dissolved salts, mainly from soluble rocks in its basin.

20. Azerbaijan is almost entirely reliant on the Kur-Araz river basin for all types of water uses. The water is used for agricultural, domestic, and industrial purposes, and for hydropower generation and recreation. The problems in the basin are related to both quantity and quality of water. Water shortage is acute because rainfall declines sharply from west to east across the basin. The average annual precipitation in central Georgia, where the Kur enters Georgia from Turkey, is 500 mm but is only 200 mm in Azerbaijan, where the river flows into the Caspian Sea. Similarly, evaporation rates soar from west to east. Drought periods in the basin are very

common. This is seriously affecting the Azerbaijan economy. Overall, despite the efforts to manage river flow, the region faces both floods and water shortages.

### **3. Other Water Resources**

21. Other rivers, formed from rain and melted snow, start in the mountains at a height of 2,000–3,500 m and flow in deep ravines, forming rapids and waterfalls on their way, and when reaching the plains break up into numerous branches or go underground; very often they do not have permanent river beds (i.e., blind rivers), being lost in the steppes or becoming marsh ridden.

22. Underground water resources make up about 25% of the river flow and have potential for future use. Currently groundwater provides only 5% of water abstraction. Azerbaijan has the largest underground mineral water resources in the region. More than 200 groups of mineral water sources have been discovered in the country. Mineral springs are divided into three categories: carbonaceous, hydrocarbon, and hydrogen sulfide.

### **4. Pollution of Water Resources**

23. Deteriorating water quality is one of the major environmental concerns. Surface and underground water are polluted by untreated municipal and industrial wastewater and agricultural run-off.

24. The Kur and Araz rivers as they enter Azerbaijan are already heavily polluted with organic matter and other pollutants from neighboring countries. Municipal wastewater containing more than 40,000 tons of nutrients is released into the Kur and Araz rivers before crossing the border. As an example, on the Azerbaijan side of the border with Georgia (in the vicinity of the village of Shikhly), in 1992–1994, average annual concentrations of phenols and oil products exceeded existing water quality standards by about 14 and 3 times, respectively. Copper mining in Georgia also heavily pollutes the Kazretula River (in the Kur River basin) with heavy metals. Upstream copper-molybdenum plants discharge hundreds of tons of strong acids and heavy metals (copper, iron, lead, and molybdenum). Extremely high levels of copper and molybdenum have been detected near the Armenian border in Shafyjly, exceeding standards by up to about 1,000 times for copper and up to 3,000 times for molybdenum. The Okhuchay River, a tributary of the Kur, becomes very acidic (pH level as low as 2.4) near the Azeri-Armenian border. These conditions are so bad that most flora and fauna cannot survive in them.

25. During the FSU period, large volumes of effluents were discharged into receiving water bodies on the territory of Azerbaijan. The largest cause of point source pollution was municipal wastewater, which polluted rivers downstream from large cities with organic matter, suspended solids, surfactants, and other pollutants. Industrial wastewater discharges polluted surface waters with heavy metals, oil products, phenols, and other hazardous substances. Industrial development and population increase have led to the formation of urban industrial settlements without adequate water treatment facilities or safe wastewater management. Both domestic and industrial wastewater has been discharged into nearby reservoirs without proper treatment, if any.

26. Municipal and industrial contamination and agricultural pesticides within Azerbaijan continue to be a problem. Since the collapse of the FSU, industrial wastewater discharges have significantly decreased, but at present, most wastewater is left untreated. Existing treatment facilities are out of date, not maintained, and work at very low efficiencies. In most cities, only

mechanical treatment is done. The frequency of industrial accidents and gulp releases is high and rising. Most pollution comes from municipal sewage, but urban storm run-off, drainage from open pit mines, and improperly designed solid waste landfills and illegal dumpsites also significantly degrade the water quality.

27. As a result, water from the Kur-Araz rivers does not meet Azerbaijan's drinking water standards, even after conventional water treatment. This is critical because the Kur-Araz river basin is the main source of drinking water in the country. The Government estimates that 80% of the country's population uses substandard water from the Kur-Araz river basin for drinking purposes.

28. The delta of the Kur River contains hydrocarbon levels up to 36 times the maximum permissible concentrations (MPCs) and phenol levels up to 10 times the MPC. The heavy pollution of the Kur River estuary is attributed to sources throughout the Kur-Araz river basin, including all the states of the South Caucasus. The Kur, in turn, is polluting the Caspian Sea, the largest enclosed water body in the world, containing 44% of the planet's lake water resources. The Caspian Sea is now seriously threatened by pollution. Much of its coastal area is considered moderately polluted, but parts adjacent to Azerbaijan are extremely polluted. Systematic water sampling shows contamination from phenols, oil products, surfactants, and other agents, caused by unregulated discharge of untreated or inadequately treated industrial and municipal wastewater, and nonpoint source discharges. Also of concern are secondary sources of water pollution from oil industries located in the sea, whose equipment and vessels are in deplorable condition.<sup>2</sup> The worst areas are Baku Bay and the waters off Sumgayit. Baku Bay has concentrations of hydrocarbons and phenols more than 10–30 times the MPCs. The oxygen levels in Baku Bay are very low, 1.8–3.0 milligrams per liter (mg/l), compared with more than 10 mg/l in healthy biological systems. Baku Bay has more than 60 million m<sup>3</sup> of sediment containing 2–40% oil compounds. The levels of phenols and mercury in the seawater near Sumgayit are extremely high (0.2–10.0, and 5.0–140.0 grams per kilogram (g/kg) of sediment, respectively). Coastal sediments away from Sumgayit contain 1–2 g/kg of hydrocarbons and 0.5–1.0 g/kg of phenols and mercury. From a biological point of view, those bottom areas are considered virtually dead, particularly affecting sturgeon and other fish that feed mostly on the bottom fauna in shallow areas.

29. The pollution of the Caspian is indeed a multinational problem: the Volga River alone, coming from Russia, may contribute a significant amount (possibly up to 80%) of the pollution load.

## **B. Municipal Water Supply**

30. There are a number of contradicting statistics on access to water supply (Appendix 3), putting urban accessibility to safe water supply at 50% (International Monetary Fund) to 90% and over (most other international sources). The basis of reports of high urban connection rates to drinking water is unclear, particularly when the water is often unsafe. From discussions with the Ministry for Ecology and Natural Resources (MENR), it is reasonable to assume that 50% or even less of the urban population have access to safe drinking water.<sup>3</sup> Surface groundwater is frequently polluted from oil spillage and leakage from pipelines and storage tanks, resulting in petroleum hydrocarbons, heavy metals, and possibly radiation contamination; run-off from heavy usage of fertilizers and pesticides in agriculture; factory wastes dumped into rivers; and excess salinity due to a rise in Caspian Sea water level and consequent seawater intrusion.

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<sup>2</sup> The Government reports the current rate of unaccountable oil leakage at 0.3% of extraction.

<sup>3</sup> The current estimate of United Nations Development Programme (UNDP) is in the same range.

Most water treatment facilities outside Baku are unable to treat water to local or international standards. Further, the service is intermittent and unreliable because of rusted water pipes and obsolete and broken equipment in water treatment plants that was not properly maintained and upgraded for more than a decade. The physical losses or unaccounted-for water are 50–60% of total production rate; cross connections with sewer pipes cause health concerns; and illegal connections are draining away the limited remaining resources.

31. Most urban centers, particularly those in the Apsheron Peninsula, including Baku, experience shortages in water resources. The problem is aggravated by pollution, inefficient use and inadequate management of the drinking water supply. The Government seems to perceive the problems as largely caused by underdevelopment of alternate water sources. Groundwater sources that have potential to meet the demand of the population of the Apsheron Peninsula for drinking water were recently discovered in the Samur-Velvelichay and Ganikh-Ayrichay lowlands. The Government believes that prospective exploration of groundwater sources should be accompanied by control over construction of various underground and surface structures that might affect groundwater quality and quantity.

32. The cities of Baku, Sumgayit, and about 75 other cities and towns, most of which are regional centers, receive a centralized water supply. While the stipulated “norm” of daily water consumption for one person is 330 liters, various sources indicate an average of 130 liters, relatively low by international standards, to 400–580 liters in Baku, very high in comparison to other countries. However, water is available unevenly in various urban centers. The high water consumption figures are the result of the poor state of transmission and distribution networks and the poor state of indoor plumbing.

33. There is a scarcity of data on the availability of sector services and the conditions of the networks and facilities. Following a request by the Asian Development Bank (ADB) during the preparation of this report, MENR prepared a list of urban water supply and wastewater systems in the secondary cities (Table 1). Selected technical data on water and wastewater utilities developed for the World Bank’s Azerbaijan Water Supply and Sanitation Sector Review and Strategy of 2000, are provided in Appendix 3. In many areas the centralized systems of water supply provide only 30% of drinking water needs. In the Gusar, Neftchala, Bilasuvar, and Jalilabad regions, the central water supply to urban settlements is only 5% or less.

34. The centralized water supply systems are characterized by gross inefficiencies and high losses,<sup>4</sup> compounded by problems with rising groundwater levels, particularly on the Apsheron Peninsula, primarily due to the rising sea level. In some parts of Baku, the water table would rise to within 0.5 m of the surface if regular daily pumping were to stop.

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<sup>4</sup> Some government sources report that recent installation of water-use meters demonstrated an effective regulatory mechanism for the prevention of inefficient resource utilization. It is also reported that promotion of this option has been deferred, although no reasons have been provided.

**Table 1: Urban Water Supply and Wastewater Systems in the Secondary Cities**

	City/Town	Population ('000)	Availability of Water Treatment (%)	Availability of Wastewater Treatment (%)	Comments
1	2	3	4	5	6
		8,141.4			
1	Nakhchivan City	364.5			W ■
2	Ali-Bayramli	70.0	52.0		W
3	Ganja	301.4			W
(4)	Hankendi	54.6			
5	Mingechevir	94.6	19.0	18.0	W
6	Naftalan	7.5		7.2	
7	Sumgayit	288.4			
8	Agdzhabedi	110.4			
(9)	Agdam	158.9			
10	Agdash	91.7	0.6	2.5	W ■
11	Agstafa	75.3			
12	Agsu	64.5			W
13	Astara	87.4			
14	Balaken	85.3			
15	Beylagan	80.0			
16	Barda	132.9			
17	Bilasuvar	78.0	9.0		
(18)	Dzabrail	62.1			
19	Dzhalilabad	175.9			
20	Dashkesen	31.2			
21	Devechi	47.2			
(22)	Fisuli	140.9			
23	Kedabek	88.3			
24	Geranboy	88.7	3.8		
25	Goychay	102.9		2.5	W ■
26	Adzhigabul	59.5			
27	Khachmaz	148.4			
28	Khanlar	54.2			
29	Khizi	13.5	0.6		
(30)	Khodzhali	24.2			
31	Khodzhavand	40.2			
32	Imishli	106.6			
33	Ismayili	74.1		3.2	W
(34)	Kelbedzhar	69.1			
35	Kurdamir	95.1	1.0	3.2	W
36	Gakh	52.3			
37	Gazakh	82.5			
38	Gebele	86.3			
39	Gobustan	35.7			
40	Kuba	140.0			
41	Kubati	34.1			
42	Kusari	83.0			
(43)	Lachin	65.6			

	City/Town	Population ('000)	Availability of Water Treatment (%)	Availability of Wastewater Treatment (%)	Comments
1	2	3	4	5	6
45	Lerik	66.2	3.8		
46	Lenkeran	193.7	6.6	6.0	
47	Masali	178.7			
48	Neftchala	73.5			W
49	Oguz	37.7			
50	Saatli	85.1	1.0		W
51	Sabirabad	140.6	50.0	10.0	W
52	Salyan	114.9	12.0	10.0	W
53	Samukh	50.2		38.0	
54	Siyazan	34.5			
55	Shemakha	83.1		2.5	
56	Sheki	161.0	14.0	8.0	W
57	Shamkir	177.3			
58	Susha	25.1			
59	Tertir	93.8			
60	Tovuz	146.6			
61	Udjar	72.8			
62	Jardimli	51.8			
63	Javlahk	110.0	5.0	6.0	W
64	Zakatala	109.3		2.0	
65	Zangilan	36.1			
66	Zerdab	47.6	1.0		W

■ included in proposed ADB Water Supply and Sanitation Project.

W = scheduled for inclusion in the 2004–2008 development plan, under preparation by MENR.

○ Areas disputed with Armenia/occupied  
Source: MENR

## C. Wastewater Management

### 1. Municipal Wastewater

35. Baku's wastewater network, in operation for 100 years, does not have the capacity today for adequate and safe operations. The total wastewater collected in Baku is reported to be 1.3–1.4 million m<sup>3</sup>/day. It is also reported that about 30,000 m<sup>3</sup>/day of untreated municipal wastewater is discharged into the Caspian Sea. However, only 50% of the collected wastewater undergoes treatment and more than 40% of the housing districts not connected. Thus, this figure should be 10 times higher.

36. Centralized wastewater management is available in Sumgayit, Salyan, and Lenkeran. For the rest of the country, there are contradicting statistics on access to municipal wastewater collection. While most international statistics optimistically place urban connection rates as high as 90%, (Appendix 3) without due explanation of the figures, in the rest of the regional centers along the coastal zone only up to 50% of the urban population are connected to centralized wastewater systems, most of which are functioning badly. Of the 62 million m<sup>3</sup> municipal wastewater collected outside the Baku/Sumgayit area, 39 million m<sup>3</sup> undergo mechanical treatment and only 5.5 million m<sup>3</sup> receive biological treatment; the rest is discharged without any treatment. The Sumgayit municipal wastewater treatment plant is in extremely bad condition,

only partly operational, and receives more than its design capacity; the resulting discharge into the Caspian is about 180,000 m<sup>3</sup>/day of inadequately treated industrial and domestic wastewater. The situation with wastewater treatment away from Baku and from the coastal zone is grim. Of the 75 cities and towns of Azerbaijan, only 16 have wastewater treatment facilities. These are equipped only for mechanical treatment, and for the most part do not function at all. Cities such as Gazakh, Tovuz, Shamkir, Ganja, Evlakh, Mingechevir, Udjar, Sabirabad, Ali-Bayramli, Salyan, and Neftchala along the Kur and Araz rivers and their tributaries discharge untreated or only partly treated wastewater into these rivers.

37. Because the networks have not been properly maintained for more than a decade, their condition is very poor and there is little or no incentive, including sufficient financial remuneration, to operate the systems. Practically raw wastewater is discharged into the environment, and cross-connections between water and wastewater networks create the potential for major epidemics from bacterial diseases, such as cholera and hepatitis; accumulation of heavy metals leads to other health complications, such as cancer.

## **2. Industrial Wastewater**

38. Oil refineries are some of the most significant sources of industrial wastewater, followed by power and chemical plants. Most of the oil refineries and some chemical enterprises have industrial wastewater pretreatment facilities. However, for the most part they are not functioning well if at all. Of 40 industrial companies operating in Baku and Sumgayit, the treatment facilities in only 7 are considered to be functioning reasonably well; most others are insufficient or are malfunctioning. Several companies lack any treatment. Some of the industries in Sumgayit and Baku reuse part of their wastewater, and one refinery in Baku reuses all of its process water. However, most companies do not reuse water, and in many areas, including Baku and Sumgayit, untreated wastewater from the oil fields and other polluting industries is mixed with municipal wastewater and discharged into a municipal wastewater treatment plant, if present, or straight into the receiving water body. About 1 million m<sup>3</sup> per day of industrial waste might be discharged directly to the Caspian without treatment. While the economic downturn of the 1990s contributed to lessening the untreated wastewater discharge flows, the concern is that should these industries restart, the condition of pretreatment facilities is far worse than a decade ago due to years of neglect.

## **D. Policy Measures in Water Resources and Pollution Control**

### **1. Policy Framework**

39. The codes of civil and criminal violations were developed during 1970–1990. In 1976–1990, source-specific and general (activity- or river basin-based) water abstraction and use standards (quotas) were developed and set for major water users, taking into consideration the quality of the water used. In the 1960s and 1970s, surface water quality standards (GOSTs) for a broad spectrum of substances were established.

40. The FSU point source discharge standards were based on ambient quality and did not require a certain type of technology for pollution control, hence promoting end-of-pipe pollution control approaches. Meanwhile, no standards, guidelines, or management practices existed for controlling nonpoint source pollution. The state statistical reporting system, introduced in the late 1980s, obliged all water users to conduct water use and discharge inventories at source. Per unit water-use fees were introduced in 1982.

41. In the 1970s and 1980s, the hydrometeorological stations (HMSs) maintained extensive hydrometeorological and ambient environmental quality control functions, conducting observations on surface water quantity and quality. After collection, the raw data were processed and published. Although HMS networks provided baseline river flow and quality data, these networks were not designed for daily resource management.

42. Regardless of requirements, existing laws, regulations, and standards were frequently ignored or violated because of overly strict standards and costs of complying with them. The system of mutual services or assistance hindered compliance, monitoring, and control.

43. After the collapse of the FSU, a “polluter pays” principle was introduced and an effluent charge system established in 1991. However, the current system is still largely similar to its FSU predecessor. The sector-based approach to water resources management is still widely used and integrated river basin-based water management principles are not used. There is no strategy to set specific and realistic targets and implementation schedules, make cost assessments, and identify potential financial sources. The economic instruments of environmental control are not functioning because they are not fully developed. Water quantity and quality monitoring data collection has greatly declined and the monitoring equipment is not maintained, is malfunctioning, or out of date; hence, the quality of collected data is not guaranteed. Remote sensing and geographic information systems (GIS) technologies for water resources monitoring and management are practically never applied.

44. Although the creation of the MENR has provided a clearer management structure in the water sector, overlapping functions and responsibilities remain. The level of cooperation between MENR and other stakeholders, particularly on exchange of information, still needs improvement, in part due to the lack of legally binding data-exchange requirements. Because the state of public financing is very poor, most water-related agencies lack financial and technical resources to implement their policies and enforce existing laws.

45. The Water Code adopted in 1998 sets the basis for water management in Azerbaijan and gives the following main principles for use and protection: (i) economic development and environmental protection; (ii) provision of quality water to the population; (iii) water management based on river basins; and (iv) water protection functions separate from water use and water industry functions. However, upholding these principles poses a big challenge.

## **2. Legal Framework**

46. The legal framework for the water sector consists of the following laws: (i) the Water Code (1998), (ii) the Law on Water Supply and Waste Water (2000), (iii) the Law on Amelioration and Irrigation (1996), and (iv) the Law on Environmental Protection (1999). The Water Code sets the basis for water management. The Law on Water Supply and Waste Water sets the legal framework for this sector. Its important features are that

- responsibility for providing water and sewerage services is given to enterprises;
- management and operation of water-supply enterprises are to be regulated by a contract with the municipalities they serve;
- enterprises now have the right to cut services to consumers in case of nonpayment or illegal connections; and
- metering the water supply is recognized as the main method for charging for water services.

47. The Law on Amelioration and Irrigation regulates the planning, design, construction, and operation of amelioration and irrigation systems. The Law on Environmental Protection identifies the legal, economic, and social bases of environmental protection. It governs the use of natural resources (such as water) and protection against pollution (domestic and industrial). This law also sets the basis for economic mechanisms, such as payment for the use of natural resources, payment for the disposal of domestic and industrial waste, and economic incentives for environmental protection. The law also defines environmental requirements and approval procedures in connection with construction or reconstruction of municipal and industrial facilities. Many decrees issued by the President and decisions issued by the Cabinet of Ministers supplement these laws.

### **3. Institutional Responsibilities**

48. The State Committee of Amelioration and Water Management is responsible for monitoring water use. While it focuses on irrigation and rural water use, it sets water-use norms and handles user relations. It is responsible for issuing water abstraction permits for surface water. It is also responsible for imposing payments for water use.

49. MENR has overall responsibility for the conservation of water resources and the prevention of pollution. It issues wastewater discharge permits, which are valid for 3–5 years. It enforces discharge permit conditions and also monitors water bodies. The National Geological Exploration Service, a department of MENR, is responsible for regulating and controlling abstraction of groundwater. The Ministry of Health (MOH), through its Center for Epidemiology and Hygiene, is responsible for setting drinking-water standards and monitoring drinking-water quality and surface water quality for recreational purposes, both in terms of health impacts. While water quality monitoring is mostly divided between MENR and MOH, the State Committee of Amelioration and Water Management also claims to have some water quality monitoring functions.

50. The State Committee of Architecture and Construction is responsible for water supply and wastewater services outside the supply area of the Apsheron Regional Water Company. In urban areas, the committee works through the municipal water and wastewater enterprises (*Vodokanals*). The committee is meant to have an advisory and monitoring role; however, due to the relative weakness of the municipalities, it has taken on a managing role. Rural water supply also falls under its responsibility.

51. The Apsheron Regional Water Company (ARWC) is a joint-stock company responsible for the treatment and distribution of water to Greater Baku, including bulk water supply to the *Vodokanals* of Apsheron and Sumgayit. ARWC share capital is fully owned by the State.<sup>5</sup>

52. The wastewater collection and treatment services in Baku are the responsibility of Bakkanalizasiya, a department under the executive power of Baku. There are recent government plans to merge ARWC and Bakkanalizasiya into a joint-stock company and privatize it.

53. As mentioned, there is little cooperation among the agencies engaged in water resources management, particularly on sharing or exchanging information. The duties and powers of all these agencies overlap, particularly on the issue of water quality monitoring. As

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<sup>5</sup> The Apsheron Regional Water Company was developed in the 1960s as result of an experiment in decentralizing municipal services and was supported in the 1990s by the World Bank.

the state of public financing is very poor, most water-related agencies lack financial and technical resources to implement their policies and enforce existing laws.

#### **4. Norms and Standards**

54. The design of water supply and wastewater infrastructure is based on building codes (SNIPs) developed during the FSU. They set and anticipate high consumption rates (norms), and require high standards of technical safety (two main pipelines and high storage capacity). Their GOSTs are compatible with World Health Organization (WHO) standards. Due to the deplorable state of networks and facilities across the country at present, most water-supply systems have difficulties in meeting these standards. The even worse condition of the wastewater collection systems and treatment facilities makes it virtually impossible to meet Azerbaijan's FSU GOST standards for wastewater treatment, which were even more stringent than European Union (EU) standards.<sup>6</sup>

55. While it is often argued that SNIP standards lead not only to drinking water over-production but also to wasteful consumption practices, one should differentiate GOST and SNIP standards. GOST standards might be overly strict and merit revision, provided there is a source of financing for the undertaking, but the massive revision of SNIP standards would be a very costly exercise and might not be necessary. Market principles, such as for estimating water production rates, should be applied. However, the technical principles and building standards necessary for the sustainability of facilities and networks are a separate issue. Developing or accepting other technical standards is a massive undertaking that requires revisions of concepts and capacities across agencies, backed up by extensive and costly technical analysis and legal and regulatory revisions. With a much weakened discipline of design and construction leading to the short life span of civil construction facilities, there is need to preserve the technical requirements that would provide some insurance to the beneficiaries in having civil works done well.

#### **5. Economic Instruments**

56. Fees for surface and groundwater abstraction and use were introduced in 1992 to stimulate the rational and integrated use of water and to raise funds for water protection. They have not been adjusted to take account of the high inflation in the 1990s and no longer serve as an economic tool. Wastewater discharge fees were also introduced in 1992; they are very low as is the collection rate. Charging is very complicated and covers an overly wide range of pollutants, most of which cannot be monitored effectively because the present environmental monitoring capacity is limited to a few pollutants.

57. Consumers are charged for both water supply and wastewater services. The tariff systems are based on heavy cross-subsidies from industry to domestic users. As a result, the rates for domestic users are very low. As an example, ARWC charges domestic users 185 manats/m<sup>3</sup> or \$0.04/m<sup>3</sup>. The rates for budget organizations and industries are 800 manats/m<sup>3</sup> and 2,200 manats/m<sup>3</sup>, respectively. However, because only 1.1% of ARWC's domestic customers have water meters, a flat rate of 12 m<sup>3</sup> per person per month is used. The rate of metering is higher for industries, about 50%. ARWC's collection rate is only 80% and the revenue collected does not cover its operating costs, leaving it in arrears, especially with its energy bills.

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<sup>6</sup> The GOST standard for fishing water use is 3 mg/l biological oxygen demand (BOD) and 6 mg/l for other uses. The EU standard for other uses is 25 mg/l BOD.

## 6. Programs

58. MENR prepared the NPESSED for 2003–2010, which was approved by the President of Azerbaijan in 2003. Among the most urgent issues, it identifies lack of drinking water in Baku and other cities, inadequate quality of drinking water outside Baku, and inadequate wastewater management countrywide. In order to address these issues, NPESSED calls for the implementation of national and regional programs to manage water resources and specifies the following actions as necessary for the protection and use of water resources on the basis of sustainable development principles:

- (i) development and implementation of a state program for effective use of water;
- (ii) promoting efficient use of water resources on the basis of comprehensive control (MENR strongly believes that the installation of domestic water meters would promote the efficient use of water);
- (iii) improvement of quality of drinking water to meet relevant standards;
- (iv) improvement of regulations governing water ecosystems;
- (v) increasing regional and international cooperation to protect transboundary rivers from pollution and ensuring effective use of water by riparian neighboring countries; and
- (vi) promotion of water reuse.

59. It should be noted that while NPESSED is articulate on a number of important issues, it does not differentiate between urgent and secondary actions. The call for water reuse might not be appropriate at the moment because it carries a larger marginal cost of improvement than does the rehabilitation and maintenance of the existing water systems, items conspicuously not mentioned in the NPESSED. The NPESSED does not mention the need for improved management of drinking-water facilities, which might be partly because control over these functions is performed by other agencies. The installation of water meters, while successful in most parts of the world, has as yet not been extensively applied in the countries of the FSU. The strong cultural perception of water as common good has precluded strict control over its use. Proper installation and maintenance of meters would require great expense and an extensive, advance public education campaign.

60. The other relevant document is the National Environmental Health Action Plan (NEHAP) prepared by the MOH in 2001, which specifies similar concerns about the urban environment. However, the level of government commitment to its implementation is not clear and most of its suggestions are superseded by the NPESSED. The Ministry of Economic Development (MOED) is developing the country's 2004–2008 development plan, which would include improvements in water and wastewater conditions in a number of cities and towns.

## 7. International Assistance

61. The World Bank supported the Baku Water Supply Project that contributed to the improvement of drinking water quality in Baku, although the levels of service still need improvement. The United States Agency for International Development (USAID), Organization for Security and Co-operation in Europe (OSCE) and Kreditanstalt für Wiederaufbau (KfW) are trying to address the appalling sector conditions in urban areas outside the capital. This ongoing international assistance attempts to promote public awareness on environmental monitoring; national and regional activities in water resources management and protection, including river-basin water resources management and prevention, control, and reduction of transboundary

pollution; long-term planning and recovery of the water supply systems, including demand management; institutional capacity building; private sector participation; and developing unhindered access to water and wastewater services, especially for the poor. The last target includes measures on raising collection rates, revision of tariffs for various population groups, and reduction in and elimination of unwarranted subsidies, supported by increasing transparency of tariff collection and spending through publication of data on production, consumption, and payment of municipal services.

62. However, there may not be adequate financing to leverage policy dialogue efforts, such that current international efforts may not be sufficient to deliver the anticipated outcomes. In order to achieve improvements in water resources and wastewater management, there is need for leadership in international assistance. The proposed ADB Urban Water Supply and Sanitation Project to cover three towns could be supported by longer-term ADB involvement in the sector.

## **E. Air Pollution**

### **1. Urban Air Quality**

63. Industrialization and urbanization over the past 30 years have resulted in significant deterioration of ambient air quality in urban areas, so that large cities in Azerbaijan were considered unsafe for human health during the late FSU period. Existing air quality standards for a wide range of substances, linked to specific industrial activities, including for sulfur dioxide (SO<sub>2</sub>), dust, nitrogen oxides (NO<sub>x</sub>), and carbon monoxide (CO) were regularly exceeded in urban areas. Baku and Sumgayit were included in the list of the most polluted cities of the FSU. Total emissions reached their peaks in the late 1980s and fell in the early 1990s due to the general economic decline.

64. Although there is limited information on ambient air quality for the last 10 years, due to a decline in baseline data collection, it is accepted that in the 1990s, ambient urban air quality temporarily improved. The drastic reduction in industrial activity in this period caused a major reduction in emissions of most pollutants, which, however, was offset to a degree by an increase in mobile sources of air emissions. Since 1996, there has been a slightly increasing emission level, representing economic stabilization. However, the increase has been irregular and the present level, while far below the 1980s' level, still generally exceeds national standards.

65. Currently, the major pollution is from motor vehicles; oil and gas industries; chemical, steel, and power plants; and small and medium-sized enterprises. The main air polluting sectors, traffic and industry, are concentrated in the largest cities. Five cities that are the locus of 96% of the air emissions are Sumgayit, Baku, Ganja, Ali-Bayramli, and Mingechevir, with most of the industrial air emissions concentrated in Baku and Sumgayit. Air pollution from large stationary sources is a concern in some of the smaller cities, but the size of the affected populations in the above five cities make levels of pollution in them a priority concern.

### **2. Mobile Sources**

66. Currently, transport is considered to be the main source of air pollution, responsible for the increase in NO<sub>x</sub>, volatile organic chemical, and CO emissions.

67. Historically, the proportion of emissions from transport in Azerbaijan was 30–40%. The early 1970s were marked by a significant growth in automobile numbers. Although a higher priority was always given to public transport, the number of passenger cars steadily increased. By 1980, the size of the car fleet was 3.5 times that in 1970, and vehicle emissions reached their peak in the late 1980s. In the early 1990s, aggregate vehicle emissions declined in the region. As industrial emissions declined dramatically, transport's share of total emissions increased to the present 65%, currently accounting for 400,000 tons of emissions based on presently monitored high ambient concentrations of CO, NO<sub>x</sub>, phenol, and formaldehyde.

68. Table 2 presents the total numbers of vehicles in 1990–2001, marked by a continuous decrease in public transport. In response, the number of registered passenger cars rose 30% from 260,000 in 1990 to more than 340,000 by 2001. The total number of vehicles rose slightly during the same period.

69. While the number of vehicles is steadily increasing, the often-stated problems with vehicle emissions are more related to high emissions per vehicle than to the number of vehicles. Within the last decade, the country witnessed a dramatic increase in numbers of poorly maintained old vehicles using low-quality fuel. More than 90% of all vehicles are more than 5-years old, and the average age of vehicles is around 15 years. Further they need leaded gasoline and do not have catalytic converters. It is reported that wholesalers and retailers frequently illegally add lead additives to low-octane gasoline. The share of foreign models, mostly used cars, has been increasing recently. However, foreign models are often of similar low quality. The public transport fleet is aging as well (Box 2), and newly procured public vehicles are second hand as a rule.

70. The system of vehicle inspection/maintenance is very poor. Responsible authorities lack finance, technical equipment, and qualified staff to check vehicle emissions properly. It is reported that the low salaries of inspectors lead to bribery and falsification of records. The ageing vehicle fleet and the lack of vehicle servicing, inspection, and maintenance, in combination with poor fuel quality, aggravate the air pollution problem. Heavy traffic and poor road conditions and lack of bypasses in most cities contribute to increased vehicle emissions. Traffic is poorly organized and congestion is routine.

**Table 2: Number of Motor Vehicles, 1990–2001**  
(‘000)

	1990	1995	1997	1998	1999	2000	2001
<b>Total</b>	<b>398.8</b>	<b>392.2</b>	<b>374.7</b>	<b>392.8</b>	<b>409.3</b>	<b>440.6</b>	<b>451.60</b>
Trucks	99.5	79.7	71.9	79.9	69.7	78.6	77.1
Buses	14.0	12.8	12.1	13.7	14.9	16.8	17.3
Cars	260.2	278.3	271.3	281.3	306.9	332.0	343.0
Motorcycles	0.0	13.3	3.2	9.3	9.3	6.4	6.7
Other	25.0	21.4	19.4	17.9	17.7	13.3	14.3

Source: State Statistical Committee. Statistical Yearbook. 2002.

**Box 2: Public Transport in Baku**

Urban transport in Baku faces the twin problems of dealing with the rapid growth in car traffic and maintaining a viable public transport system. The total emissions from mobile sources in Baku reached 285,000 tons in 2001, which was 71% of total emissions from mobile sources in the country.

Public transport in Baku relies on 300 buses, 8–10 trams, and 2 train lines. In addition, 2,600–2,700 private minibuses are operating in the capital and their number is still growing. The vehicles are very poorly maintained and do not undergo regular technical inspections. The Transport Department of Baku prepared an annual program for sustainable development of public transport, which contains such proposals as replacing old buses, reducing the number of minibuses, introducing European Union vehicle emission standards (Euro 2 and Euro 3 standards), diverting trucks and heavy vehicles from the city, and introducing stricter controls on standards and technical requirements. To date, however, none of these measures have been implemented.

**3. Stationary Sources**

71. In the 1970s and 1980s, stationary sources' share of total emissions was more than 60%, predominantly due to the large industries located in Baku and Sumgayit. Such emissions, like mobile source emissions, reached their maximum levels in the late 1980s. The collapse of the FSU was followed by the mass closure of industrial activities, resulting in a significant fall in industrial emissions.

72. The current primary source of atmospheric pollution from stationary sources is the release of associated gasses by power plants, petrochemical plants, oil refineries, and factories, especially in Sumgayit and Baku; venting of natural gas from oil wells; and burning of untreated garbage. In Baku, emissions of industrial pollutants unrelated to the oil industry are relatively small, with the exception of releases of chlorofluorides from air conditioners and the refrigeration industries and dust from cement production. In Sumgayit, pollutants include hydrogen fluorides from aluminum production; mercury from chlor-alkali production; heavy metals, such as lead, zinc, and cadmium in the dust from steel plants; and various chlorinated substances from the petrochemical industries.

73. Table 3 presents the air emissions of selected air pollutants from stationary sources during 1990–2002. Since 1996, stationary source emissions have been slightly increasing. This may be attributed to increased oil production activities, rapid decrease in the use of natural gas as a fuel at power stations, and the use of highly sulfurous mazut. However, stationary source emissions are far below the 1980s' levels because existing facilities still work at low capacities (about 10–20%) and new industrial developments are few. Although gross emissions are reduced, current per-unit emissions are believed to be higher than those of the 1980s because existing production and pollution control technologies have not been maintained for over a decade, and are out-of-date and inefficient. Besides, current compliance assurance monitoring and control systems do not function effectively. If, in the near future, these enterprises increase/restore their operations, the ambient air condition in the large industrial cities could reach levels of ecological catastrophe. The new Baku-Ceyhan pipeline, expected to be

completed soon, will increase air pollution levels caused by increased oil production if no action is taken to modernize the oil industry.

**Table 3: Emissions of Selected Air Pollutants from Stationary Sources**

('000 ton)

	1990	1995	1996	1997	1998	1999	2000	2001	2002
<b>Total</b>	2,109	879	382	390	443	575	515	577	217 <sup>1</sup>
Particulates/dust	148	23	18	22	21	17	19	28	29
Liquid and gaseous substances, of which:	1,960	856	-	368	422	558	496	549	188 <sup>1</sup>
SO <sub>2</sub>	90	50	40	38	35	37	35	15	14
NO <sub>x</sub>	59	32	24	26	25	24	24	27	26
CO	71	22	19	23	21	22	26	28	18

<sup>1</sup> Data need verification.

Source: State Statistical Committee. Statistical Yearbook. 2002.

#### 4. Trends in Air Quality and Related Concerns

74. In general, the ambient air quality in Azerbaijan has improved in recent years as a consequence of the sharp decrease in air emissions from stationary sources. However, urban air pollution remains a matter of ongoing concern.

75. Since the early 1970s, the air quality monitoring stations were concentrated in densely populated and highly industrialized cities. Monitoring was based on manual sampling. The following pollutants were monitored according to standard methodologies at all monitoring stations: total suspended particles (TSP), SO<sub>2</sub>, CO, and NO<sub>x</sub>. A broad spectrum of specific substances was measured at some monitoring sites in several major cities. However, there were no regular measurements of lead and volatile organic hydrocarbons (VOCs). There were also no stations measuring particulate pollution (PM 10). In general, the ambient monitoring systems were designed to detect longer-term pollution trends rather than high pollution peaks, and did not assist in daily air quality management.

76. Currently, air quality data are collected by the National Monitoring Department of MENR and by the sanitary and epidemiology centers of MOH. Several pollutants are monitored daily in eight cities for ambient concentrations of SO<sub>2</sub>, NO<sub>x</sub>, CO, hydrogen fluoride, and some other compounds. While the Azeri standards for SO<sub>2</sub>, NO<sub>x</sub>, and particulates are more or less equivalent to WHO guidelines, the monitoring network has a relatively small number of stations and the mode of their operation and ability to conduct air quality analyses are limited. Therefore, the network does not provide an accurate picture of Azerbaijan's urban air quality situation. Concentrations of VOCs—the most obvious pollutants in Baku and Sumgayit, with their oil and petrochemical industries—are not monitored on a regular basis. VOC emissions contribute to the formation of low-level ozone, a major component in smog, which has severe health effects at higher concentrations, also damaging vegetation. Like VOCs, ozone monitoring is not a part of the ambient monitoring program. Lead is a third pollutant of concern that is not measured. For some pollutants monitored in Azerbaijan, WHO does not have guidelines.

77. The urgent problem related to ambient air quality monitoring is the drastic decline in data collection due to lack of financial resources and technical equipment. Existing monitoring networks do not meet international requirements in terms of number and location of sites, data collection, storage, processing and reporting methods, etc., to conduct daily resource management and make short- to medium-term forecasts. Although, in the past, some of the

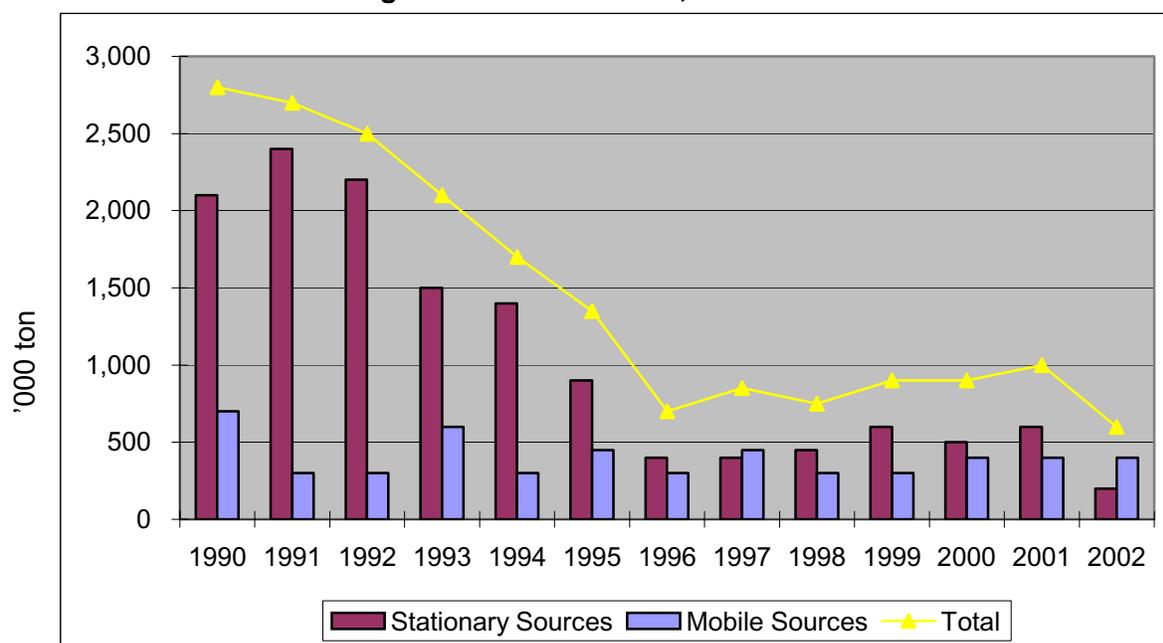
ambient monitoring stations within the region were measuring regional background pollution levels, at present there is practically no information on transboundary movements of pollutants.

78. Figure 1 shows the total air pollution emissions during 1990–2002, based on available information. Emissions peaked in 1991, totaling more than 2.1 million tons, when mobile sources accounted for less than 0.3 million tons. In 1995, total emissions were down to 1.3 million tons, of which 0.9 million tons were from stationary sources and 0.4 million tons from mobile sources. In 2002, mobile sources were still about 0.4 million tons while stationary source emissions decreased to about 0.2 million tons. In line with this trend, Azerbaijan's carbon dioxide (CO<sub>2</sub>) emissions over the past decade have been declining, including CO<sub>2</sub> emissions from petroleum and natural gas processing and use.

79. In spite of lowered total emissions, air pollution is still perceived as critical. Annual air concentration levels of soot in Baku in the mid-1990s averaged about 95 micrograms per cubic meter (ug/m<sup>3</sup>), higher than the standard of 50 ug/m<sup>3</sup>. In Sumgayit, the average annual concentration of dust during 1993–1995 was about 200 ug/m<sup>3</sup>, compared to the standard of 150 ug/m<sup>3</sup> and WHO guidelines of 60-90 ug/m<sup>3</sup>. The monitoring data from 1991–1995 show that the levels of several pollutants in the cities of Mingechevir, Ali-Bayramli, Ganja, Sumgayit and Baku were up to five times higher than the discharge standards. The concentrations of NO<sub>x</sub>, furfural, dust, and suspended particulates all exceeded the maximum allowable concentrations in 2002. The data for the first part of 2003 show that concentrations of dust, NO<sub>x</sub>, soot, and furfural again breach the discharge standards.

80. There is a further concern in Azerbaijan that projected economic growth will cause unsustainable deterioration of urban air quality, particularly because air quality monitoring is weak and the pollution control equipment, both at stationary and mobile sources, is in much worse condition than 10 years ago.

**Figure 1: Air Emissions, 1990–2002**



Source: State Statistical Committee. Statistical Yearbook. 2002.

81. Historically, little attention was paid to indoor air quality. Very little is known about the indoor concentrations of asbestos and other artificial fibrous materials used as building materials or insulation. Of concern are current concentrations of such substances as formaldehyde from chipboard and hydrocarbons from paints, cleaners, adhesives, timber, and furnishing. The issue of indoor air quality is becoming more pronounced as, in the absence of natural gas due to problems in its delivery, the urban population increasingly uses domestic heaters with alternative fuels without safe fuel combustion devices. Noxious gases from low-technology burners and unsafe fuel are then produced. A related area of concern is that shortage of oxygen can easily occur in winter, when heaters are in use and windows are closed, causing incomplete combustion. No significant studies have been completed on indoor air quality in the country.

## **5. Policy Developments**

### **a. Legal framework**

82. Air quality control is still largely based on FSU principles and approaches. In 1951, health-based air quality standards were set for 10 pollutants. By 1972, standards existed for 98 pollutants and by 1991 for 479 substances. The standards were based on toxicological studies and were believed to be set at safe levels. At the beginning of the 1980s, source-specific emission limits were introduced for stationary sources in order to achieve ambient air quality standards. They used a passive method of pollution control (end-of-pipe approach) and did not actually promote pollution prevention and the introduction of cleaner technologies. Regular statistical reporting requirements were introduced for all large stationary sources in the late 1970s. Emission-producing facilities were required to report on their annual emissions using either direct stack measurements or engineering calculations, based on source-category emission factors or mass-balance methods.

83. In 1974–1980, vehicle design and technical standards were developed and introduced. Standards were also developed for fuel quality, specifically for diesel sulfur and hydrocarbon content, gasoline lead content, etc. However, the system of vehicle inspection was weak and ineffective.

84. The Law on Environmental Protection of 1999 provides the basis for developing and implementing programs to combat air pollution, and in 2001 the Law on Air Protection was adopted. The latter sets out the requirements for monitoring, organization of activities, responsibilities of institutions, control and inspections, court procedures, and international cooperation. The law foresaw the issuance of regulations with detailed procedures for air protection, which have now been adopted (the last one in April 2003) but not yet implemented. The law also calls for changing the ambient quality standards from the old GOST standards to those consistent with international guidelines and standards, such as the health-based air quality guidelines of WHO. However, the conversion of GOST standards into internationally accepted standards would be complicated and require significant financing and training inputs, requiring not only changes in quantitative values, but also resource- and time-consuming changes in the data collection, processing, and analytical systems.

85. The Law on Hydrometeorological activity, adopted in April 1998, is the legal basis for hydrometeorological measurements and environmental monitoring.

86. In spite of much progress, mainly in line with FSU practice, separate sanitary and ecological standards and approaches are still authorized. For example, the source air

monitoring is not primarily designed to address health effects, and the relation between air pollution and certain health effects is not considered. At the same time, the ambient air quality standards are only health-based and do not take into consideration protection of ecosystems and amenities. As another vestige of FSU laws, there is no differentiation between old and new vehicular models—only CO and soot content in exhaust gases are regulated; also, there are no standards for NO<sub>x</sub> and hydrocarbon emissions. Overall, it is not clear to what extent the FSU emission standards are still in use, including source-specific ambient-based standards for stationary sources. The standards need to change not only in terms of quantitative values, but also in terms of data collection, processing, and analytical systems, requiring resources and implementation mechanisms to undertake the appropriate measures.

87. The poor enforcement system precludes compliance to existing standards, laws, and regulations. There is no legal basis to undertake the required frequency and quality of inspections and emission measurements. The emission charges introduced in 1991 cover hundreds of pollutants that are impossible to monitor. The criteria for calculating the rates are unclear and the charging system is very complex. Charges and administrative penalties imposed on violators, including permit conditions, are symbolic, encouraging polluting activities. Industries have no incentive to lower their emissions below legally binding emission levels or introduce technological breakthroughs.

#### **b. Institutional framework**

88. In the early 1970s, the State Inspection was responsible for inspecting stationary source pollution control equipment, the State Sanitary-Hygienic Service for setting ambient air quality standards, and the Hydrometeorological Service, now part of MENR, for ambient air quality data collection. HMSs maintained ambient air quality monitoring networks. None of the above agencies had regulatory functions.

89. In 2001, MENR took over the functions of the State Nature Protection Committee established in 1988 to improve environmental performance and enhance the coordination of activities in this field. Currently, MENR is responsible for developing policies, drafting legislation and regulations, implementing international agreements and conventions, and for source (stack) air quality monitoring.

90. MENR has the regulatory function of issuing operating permits for stationary sources. All enterprises whose activities generate air pollution need to receive permission from MENR. A so-called ecological passport (Box 3) is developed by an enterprise at its own expense and approved by MENR. The ecological passport is a normative technical document containing data on the company's use of resources and assessment of the environmental impact of its manufacturing activities. Discharge standards are set for every pollution source in an industry and vary according to the type of industry, its location, and the type of pollutants. When emission limits cannot be achieved for some objective reasons, the industry is requested in theory to decrease pollutant concentrations in stages until the maximum allowable emissions are reached. MENR is also responsible for developing general policies, programs, regulations, and methodologies in the air protection field.

### **Box 3: Permitting System: Ecological Passports**

The system of issuing permits in Azerbaijan has its roots in the FSU period, with no changes introduced in the system in the past decade.

MENR issues ecological documents on the impact on the environment to potentially polluting enterprises. The documents include maximum allowable emissions, maximum allowable discharges, and an "ecological passport." The last item is specific to countries of the FSU and remains the main environmental document for enterprises. It contains a broad profile of an enterprise's environmental impacts, including resource consumption, waste management, recycling, and effectiveness of pollution treatment. Enterprises develop the draft passport themselves and send it to MENR for approval. Approval is valid for 3 years, after which it must be reconsidered. Reconsideration is also required when there is any reconstruction or any other change requiring a state ecological expertise (SEE) procedure.

MENR inspectors check compliance with the conditions set in the ecological passport. Enterprises pay both for "allowed" emissions and for excess emissions, using a three-tier system, including payment for allowable units of pollution (normal rate); payment for each unit above the limit (increased rate), and a fine for breaches of the law, plus compensation for the environmental damage done. All payments go to the State Environmental Protection Fund.

91. Within MENR, several bodies have specific responsibilities relating to air: (i) the Department of Environmental Policy and Environmental Protection; (ii) the National Monitoring Department; (iii) National Hydrometeorological Department; (iv) the Climate Change and Ozone Center, established in March 2003, within the Hydrometeorological Service, currently working on the implementation of the United Nations Framework Convention on Climate Change and developing projects on climate change issues; and (v) the State Control Inspectorate for Environment and Natural Resources Use, which conducts compliance assurance monitoring and law enforcement.

92. Other ministries and state institutions that have specific responsibilities with regard to air management include: (i) the Sanitary Epidemiological Service of MOH, responsible for ambient air quality in urban areas and protection of the population, and which develops and sets health-based ambient air quality standards in cooperation with MENR; (ii) the State Statistical Committee, which reports annually on air emissions; (iii) the recently established Ministry of Transport; (iv) the Ministry of Internal Affairs through the State Traffic Police, responsible for inspecting and monitoring mobile sources; and (v) the executive power of Baku, Department for Transport.

93. Since 2002, overall state control over air quality is in MENR. However, because both MOH and MENR still carry out air quality monitoring responsibilities, there is some duplication of functions.

### c. Programs

94. As air pollution continues to impose high economic and social costs on Azerbaijan, the national environment action plan (NEAP) has set the following objectives in air protection: (i) inventory of industrial sources of air emissions; (ii) identification of ozone-depleting substances used, and use of substances included in the Montreal Protocol and the Vienna Convention; and (iii) improvement in air quality in urban populated areas. NEAP contains numerous technical, project-related recommendations, such as the purchase of equipment for laboratories, to control air pollution. However, it includes neither a clear timetable nor the budget required for each of these projects. Only a few projects have been implemented so far.

95. Another important policy document containing objectives for air management and air quality is NEHAP. It foresees the following actions:

- (i) rehabilitation and replacement of old gas and dust filters in industrial enterprises;
- (ii) adjustment of the air quality standards;
- (iii) establishment of environmental control stations equipped with gas analyzers at town entrances to check vehicles' technical condition in terms of exhaust toxicity, and subsequent services to correct malfunctions;
- (iv) monitoring air quality in large towns using a common databank;
- (v) development of a mathematical model to forecast air pollution, define toxic components in the air, and map air pollution;
- (vi) establishment of an effective public warning system for monitoring air quality in residential areas and other areas in cities and towns where an increase in air pollution might damage public health;
- (vii) research into acceptable limits for new chemical compounds, biological agents, and environmental physical factors; and
- (viii) informing the population about urban air quality conditions.

However, the levels of government commitment to NEHAP are unclear. The suggestion to "adjust" air quality standards also needs clarification.

96. NPESSED includes a set of measures to address air pollution but, like NEHAP, has neither a clear timetable nor a budget for the following projects:

- (i) rehabilitation and replacement of gas and dust capture facilities at industrial enterprises;
- (ii) relocation of industries out of cities and away from dense urban development;
- (iii) improvement of legislation, including adoption of regulations on levels of negative impact by vehicle exhaust to the environment;
- (iv) complete phase out of lead fuel for vehicles;
- (v) prohibition of import and exploitation of old vehicles not meeting safety requirements;
- (vi) prohibition of old noncompliant transport means and disposal of outdated substandard transport means;
- (vii) reducing the density of vehicles within towns through the creation of ring roads and reconstructing highways to meet international standards;
- (viii) introduction of environmentally friendly transport;
- (ix) improvement of air quality by expanding green areas and better pedestrian areas within cities; and
- (x) ensuring that imported vehicles are equipped with catalytic converters and comply with EU norms.

## 6. Global and Regional Atmospheric Issues

97. The contribution of Azerbaijan to global and regional environmental processes, such as climate change, stratospheric ozone depletion, and acid rain, is presumably insignificant, taking into account its small economy and the medium to low development level on the United Nations Human Development Index. As for global and European CO<sub>2</sub> emissions, the total contribution of the South Caucasus (including Armenia and Georgia) in 1950–1999 was only about 0.4% and 0.9%, respectively.

98. It is assumed that as the economy of Azerbaijan begins to recover, both production and consumption levels will go up, accompanied by increased contribution to global and regional atmospheric problems. Whether or not the levels will be below or above the late 1980s levels depends on the macroeconomic development scenario and the implementation of commitments taken under relevant international treaties and conventions.

## 7. International Agreements and Activities

99. At the fourth "Environment for Europe" Ministerial Conference in 1998, Azerbaijan agreed to the regional strategy for phasing out added lead in gasoline by 2005, and it has banned the use of leaded gasoline since 1997. However, enforcement is weak.

100. **United Nations Framework Convention on Climate Change.** Azerbaijan signed the United Nations Framework Convention on the Climate Change in 1992 and ratified it in 1995. In 2000, it ratified the Kyoto Protocol to the Convention. For the implementation of the Convention, the State Commission on Climate Change was established in 1997 by presidential decree. In 2000, with financial support from the Global Environment Facility (GEF), national experts implemented phase II of the project "Measures to Build Capacities in Priority Areas." The objectives were to determine the technical needs for capacity building and to assist in capacity building to participate in the climate-monitoring network. Currently, Azerbaijan is preparing to apply for GEF assistance to prepare its second National Communication on this subject.

101. **Convention for the Protection of the Ozone Layer.** In June 1996, Azerbaijan ratified the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer. MENR is the national coordinating body, which develops and establishes the necessary regulatory and legal framework to control the trade in and use of ozone-depleting substances (ODS), to enable Azerbaijan to fulfill its obligations under the Montreal Protocol. The National Ozone Center was established to help phase out ODS. The initial country program for the phase-out of ODS was compiled in 1997, and several projects in cooperation with GEF have since been implemented. The Chinar refrigerator plant in Baku and the Sumgayit compressor plant are phasing out ODS through initiatives aimed at recovery/recycling of refrigerants and establishment of halon banking. A joint Climate Change and Ozone Center was established in 2003 within MENR.

102. **Convention on Long-range Transboundary Air Pollution.** Azerbaijan has been a Party to the United Nations Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution since 2002, but has not ratified any of the protocols. The Government intends to ratify the Protocol on Persistent Organic Pollutants, the Protocol on Heavy Metals, and the Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe in the near future.

103. Although cooperation at the global level is high, there is practically no cooperation at the regional level, in particular due to political tensions with neighboring Armenia.

## **F. Energy, Heating, and Gas**

104. During the FSU period, all urban areas around the country were covered by an electrical grid and a 24-hour supply. The energy crisis of recent years led to the curtailing of that electric supply regime and introduction of an intermittent supply of only 1–2 hours per day in secondary cities and rural areas.

105. Municipal heat supply is provided by industrial heating stations and municipal district heating stations, house boilers, and individual stove or electric heaters. Most heating stations and house boilers are worn down and ineffective. The heating mains incur significant losses of heat due to their poor condition.

106. Natural gas is served to the Apsheron Peninsula, Baku, large towns, and regional centers of the coastal zone. Gas mains are connected to all urban settlements of the coastal zone except the mountain villages and some distant settlements. Shortage of gas resources prevent extending the service to the rest of the country. Corrosion is the most important problem. The transportation losses of gas reach 18–20% of the total volume of gas supplied. Due to the current shortages in energy supplies, timber is gaining increasing acceptance as a fuel for domestic heating.

107. The Government has recognized the large scale and unsustainable nature of indirect subsidies for electricity, gas, and water and recently took important decisions to restructure these sectors. In March 2002, the then President of Azerbaijan signed a decree on measures to strengthen financial discipline in the energy and water sectors. The decree approved a comprehensive energy sector reform program following consultations with the International Monetary Fund (IMF), with input from the World Bank and the European Bank for Reconstruction and Development (EBRD). The key elements of the program are direct budget subsidies to socially disadvantaged and strategically important consumers; improvement of collections and enforcement mechanisms; creation of a tariff board and tariff regulation; close monitoring and accounting of utilities; and private sector involvement in gas distribution and water utilities.

## **G. Solid Waste**

### **1. Solid Industrial and Hazardous Wastes**

108. During the FSU period, intense industrial activities—mostly heavy and chemical industry, including gas and oil, ferrous, chemical, machinery, as well as food and light industries—produced high volumes of solid industrial and hazardous wastes. The drastic decline in industrial activities that followed the collapse of the FSU resulted in a sharp decline in industrial waste generation. In spite of some growth in industrial output from the mid-1990s, most facilities still work at about 10–20% of their capacities. Responding to local markets and locally available raw materials, the structure of industry shifted to oil and gas operations, mining, cement manufacturing, and food processing. At present, oil production, chemical and mineral resources extraction and processing, power plants, and hospitals are the major generators of solid and hazardous wastes. Statistical data on the generation of solid industrial and hazardous wastes

are not reliable because various sources give different figures. Tables 4 and 5 give estimates by MENR.

109. Particularly acute is the problem of the management of waste accumulated over decades of environmentally unsustainable development, as well as of newly accumulated waste. At present, most hazardous waste ends up either at the site of its generation or at unorganized dumps. Known hazardous waste disposal sites are overloaded and not adequately sealed. There are no financial or institutional mechanisms to properly arrange for new sites.

110. The oil resources are owned by Azerbaijan and their exploration and exploitation are under the responsibility of the State Oil Company of Azerbaijan. It has signed agreements with approximately 30 companies from 15 countries requiring, among other things, that oil exploration and drilling should be conducted according to international environmental standards. Reportedly oil companies are carrying out environmental research for safe processing of oil sludge. However, oil-containing products are still found at both illegal and legal dump sites with no protection against run-off or groundwater seepage.

111. The management of hazardous chemicals is not coordinated among different authorities (mostly MENR and MOH) at both central and local levels, and no appropriate information for decision-making is available. There is lack of training in safe handling of hazardous chemicals. There are no regional coordination policies and activities for the integrated management of chemicals and hazardous wastes.

112. Both in urban and in rural areas, hospital waste is disposed of together with municipal waste, after disinfecting contaminated material by soaking it in hypochlorite solution. Syringes and sharp materials are disposed of in separate rigid containers, which, at least in the largest hospitals, are collected by the chief nurse for separate disposal.

113. Before the collapse of the FSU, much of the hazardous waste was recycled. However, in 2002, only some 700 tons of hazardous waste were reused.

**Table 4: Generation, Treatment, and Disposal of Hazardous Wastes**  
(‘000 ton/year)

Item	1995	1996	1997	1998	1999	2000	2001	2002
Generation of toxic waste	27.0	–	36.1	33.9	33.0	26.6	16.4	9.8
Used or recycled toxic waste	25.4	–	8.1	30.5	14.8	11.4	0.4	0.7

– = unknown

Source: State Statistical Committee. Environment. Statistical Yearbook. 2002.

**Table 5: Treatment of Toxic Waste in Baku and Sumgayit**  
(‘000 ton/year)

Location	1995	1996	1997	1998	1999	2000	2001
Baku	25.4	0	7.4	15.7	5.5	10.4	0.3
Sumgayit	0	0	0.7	14.7	9.3	1.1	0.1

Source: State Statistical Committee. Environment. Statistical Yearbook. 2002.

114. Other initiatives and policies promoting prevention/minimization of toxic wastes at source are slow to develop. An inventory of all sources of hazardous waste was scheduled to be drawn up by mid-2002, but it has not yet been completed. Some enterprises report the amounts of hazardous waste they generate but, in the absence of any legal requirement, this is not done regularly by all enterprises. Some sludge from oil production might be treated by private companies, but no information is available.

115. Since the collapse of the FSU, the rising problem of transboundary movement of toxic and hazardous waste has become critical. Nonexistence of sound law enforcement and monitoring systems and high levels of corruption pose the unfortunate opportunity for Azerbaijan to become a haven for international waste trading.

116. The present deplorable status of waste management, including industrial and hazardous wastes, is caused by the lack of appropriate national legislation and institutions. The problem of liability for past pollution is not reflected in national legislation. Licensing systems for industrial wastes are not introduced. Waste classification systems are either nonexistent or require major improvement and there is virtually no system of toxic waste and contaminated site inventory. As a result, public awareness is extremely low. A number of positive changes are, however, taking place. The Hazardous Waste Management Agency was established in MENR in 2003 and a draft national hazardous waste management strategy, developed with help from the World Bank, is now in the process of review and adoption by the Government. Azerbaijan is a recipient of other international help, including the development of a national oil spill contingency and the remediation of mercury contamination at the chlor-alkali plant in Sumgayit. The International Medical Corps is currently implementing primary health care programs in six rural regions in the south of Azerbaijan (Saatli, Sabirabad, Imishili, Bilasuvar, Beylagan, and Fizuli), to install incinerators in selected health facilities.

117. Overall, while the Government realizes the urgency of needs and assigns high priority to a hazardous waste management strategy, continuous international assistance might be the key to improving the situation.

## **2. Radioactive Waste**

118. The issue of radioactive waste is related to the oil drilling and processing operations in Azerbaijan. Radio nuclides of naturally occurring radium, thorium, and potassium that are present in rocks and gases are brought to the surface when water is pumped into the pipes to maintain steady flow. Of concern is radioactive contamination in residential areas near oil fields. The other sources of radioactive wastes are research and medical institutions and FSU military sites, where significant amounts of radioactive waste have accumulated. There are no comprehensive inventories of sources, and no special storage facilities. The available data are often classified and not available to the general public. Frequent accidents take place, such as the recent pollution of Baku's groundwater with water of high radium-226, thorium-228, and potassium-40 content that was used in a Baku iodine plant as a water source. Exposure to radiation of children living in these contaminated areas may lead to an abnormally high number of cases of leukemia or other diseases, but no studies have been carried out so far to assess this potential problem. Radioactive waste is disposed of at a special facility (IZOTOP) under the authority of the executive power of Baku. The IZOTOP facility is located at approximately 37 km from Baku, in a relatively isolated area with no groundwater up to a depth of 600 m, and 10 km from the nearest water and gas pipelines. The facility was established in 1963, and since then has served as the only controlled landfill for radioactive waste in Azerbaijan.

119. A number of positive changes are taking place: (i) the creation of the Hazardous Waste Management Agency within MENR in 2003; (ii) collaboration with the International Atomic Energy Agency on training and technical assistance that started in 2000; (iii) Azerbaijan's participation since 2003 in an international program to establish a computerized registry of radioactive material; and (iv) an upgrade of the IZOTOP facility, currently underway, through a European Union Technical Assistance for the Commonwealth of Independent States (TACIS)

grant of \$4 million; the long-term sustainability of this facility is to be ensured through fees from private enterprises using its services.

### 3. Municipal Waste

120. Population growth and urbanization in recent decades have resulted in increased generation of municipal wastes. The quantity of municipal waste generated in major cities is presented in Table 6. Municipal waste generation has been increasing at about 0.5% per year since a slight upturn of the economy began in 1996. According to MENR, the quantities of municipal waste generated in urban centers other than Baku are small. This could mean that the reporting systems in the other cities are not reliable and that many illegal dumps exist that are not taken into account. Setting up a good reporting system for municipal waste generation should be the first step in improving its management.

**Table 6: Municipal Waste Generated in Major Cities in 2002**

City	Population	Municipal Waste Generated Total ('000 ton)	Municipal Waste Generated Per Person (ton)
Baku	1,818,000	641	0.35
Ganja	301,000	120	0.40
Sumgayit	288,000	167	0.58
Mingechevir	95,000	21	0.22
Ali-Bayramli	71,000	11	0.15

Source: Hazardous Waste Management Agency, MENR. 2003.

Note: data in m<sup>3</sup> were converted into tons using the following ratio: 3 m<sup>3</sup> = 1 ton.

121. Solid municipal waste, most of which is household waste, contains up to 35% food waste, 20–40% paper, 3–5% wood, 4–5% textile fabrics, 4–5% glass breakage, 1–2% ferrous and nonferrous metals, and up to 10% polymeric materials. Since 1990 the content of food residues has somewhat decreased and that of soil, silt, and debris increased. The share of paper and polymeric materials has been increasing. Construction waste accounts for 14% of all municipal waste on average, with higher percentage during summer.

122. As there are no regulations on municipal waste collection and no disposal standards, there is virtually no waste separation or recycling. Very small quantities of municipal waste are burnt (1.5–2.0%) and processed (1.0–1.5%), mainly recycling of glass bottles in some urban areas, while the majority of waste is disposed at municipal waste landfills that are overloaded, improperly operated and maintained, and do not meet minimum health and environmental requirements. The only municipal waste processing facility in the country operates in Baku and, besides being in poor condition, is obsolete (Box 4). At the same time the waste management situation in Baku is still much better than in the rest of the country. Countrywide, practically all municipal wastes are disposed of without any state control, and illegal dumping is common. Industrial waste and even hazardous waste is dumped into the municipal waste disposal sites. In peri-urban areas, garbage is dumped directly on riverbanks, threatening the quality of surface waters and groundwater. There is no protective layer at the bottom of the dumps to prevent hazardous substances from leaching into groundwater. Similarly, there are no measures for collection and treatment of surface run-off that pollutes groundwater. At the same time, there has been no research or analysis of the physical characteristics of the soil around the landfills. The absence of controlled landfills for environmentally sustainable municipal waste disposal creates the following problems:

- risks of soil and groundwater contamination with heavy metals, toxic organic chemicals, and other hazardous substances, especially where industrial and municipal wastes are dumped together;
- risks of evaporation of substances containing heavy metals and toxic organic pollutants from uncontrolled municipal waste landfills;
- breeding places for stray dogs, rodents, and insects, spreading cholera, tularemia, hepatitis, and other diseases; and
- release of toxins, and products of incomplete combustion and smoke from open-land waste burning in the ambient air.

#### **Box 4: Municipal Waste Collection and Disposal in Baku**

The volume of municipal waste generated in Baku depends significantly on the season. During summer, it is more than 50% higher than during winter, the average volume in February being 54,822 m<sup>3</sup> and in July, 144,842 m<sup>3</sup>. During the summer, municipal waste swells with “green waste” (grass and bush cuttings and food waste, such as watermelons), and nonrecycled plastic bottles, which are collected and disposed of with municipal waste. Three private companies, UP Azerbaijan, Kasko RCP, and Kasko Waste Services, under contract with the Communal Department of the city of Baku, are responsible for collection, transport, and disposal of municipal waste. The largest is UP Azerbaijan, which is a joint venture with a private German company. About 70% of its assets are owned by UP GmbH (Germany) and 30% belong to the city of Baku.

Special waste trucks collect municipal waste with compacting devices to ship waste to a landfill. There is no separation of municipal waste, except for glass bottles and bread, which are put in separate containers. The Balakhany disposal site, located about 25 km from the city, is the city’s main facility for municipal waste. It also contains a waste processing facility. Disposal of hazardous and oil-containing wastes in the dumpsites creates a serious problem because of the contaminated run-off. As there is no oil separation, the rainwater washes off both hazardous chemicals and oil. There is no monitoring system for the quality of groundwater, so it is impossible to estimate the extent of contamination from run-off. Due to weak management the landfill waste is customarily burnt in the open, leading to air pollution, which affects neighboring communities. There are three other landfills, even less advanced, but they are much smaller and less used.

#### **4. Soil Pollution**

123. During the FSU period, industrial activities, traffic emissions, and dumping of municipal and toxic solid wastes affected the soil quality in both urban and rural areas. The urban and peri-urban lands in Sumgayit, Baku, Ganja, Ali-Bayramli, and Mingechevir are the most polluted. Besides directly affecting human health, soil pollution causes groundwater pollution and food contamination through direct and indirect uptake in vegetables and other crops grown in urban and peri-urban areas.

124. Copper, lead, and zinc mines are the main sources of heavy-metal soil pollution. Steel plants produce dust containing about 15–30% zinc, 3–5% lead, and about 0.1% cadmium.

Atmospheric deposition from vehicles<sup>7</sup>, oil exploration, and power plants are other sources of soil pollution with heavy metals. In some areas, the average concentrations of heavy metals exceed acceptable levels by factors of 3–60. Zinc levels in soils are up to 50–60 times the acceptable levels, lead levels up to 8 times, cadmium up to 3 times, nickel up to 2 times, and copper up to 10 times the acceptable levels .

125. Urban areas, such as Sumgayit, are also severely polluted by mercury used in chlor-alkali plants. During the FSU period, the mercury loss amounted to approximately 1–2 kg/ton output. High concentrations of polychlorinated biphenyls (PCBs), used as semiconductors in transformers and condensers, were found in soils around power and electrical machinery plants, particularly in Baku and Ganja. As a result, many industrial sites have become practically “brown fields,” whose clean-up costs have not yet been calculated.

126. Apsheron Peninsula soil is known for having the most acute oil degradation. A century of oil production, combined with environmental neglect, has left more than 10,000 hectares of urban and peri-urban land heavily contaminated. In the Apsheron Peninsula in the 1980s and 1990s, average soil oil content in the topsoil regularly exceeded background levels (100 micrograms per liter) by a factor of 56. At some places, soils are so polluted that they need to be buried like radioactive wastes. The contaminated areas are also sources of air pollution resulting from the release of volatile hydrocarbon compounds, particularly in summer.

127. MENR intends to develop criteria for the rehabilitation of contaminated sites and to implement decontamination projects. The inventory in four cities, Baku, Sumgayit, Mingechevir, and Ganja, of all waste, both newly generated and accumulated, was tentatively scheduled to be completed by end-2004. According to the State Oil Company of Azerbaijan, a program has been developed for the rehabilitation of some lands that were used for oil exploration. It is also reported that the World Bank is currently considering a pilot project for land rehabilitation at the Tagieva oil-gas industrial complex, using advanced biological methods. Although there is very little oil production onshore at present, further international assistance is needed to rehabilitate oil-contaminated lands.

## **5. Environmental "Hotspots"**

128. For decades, large urban areas were sites of intensive industrial development and gradually became environmental “hot-spots,” with a broad spectrum of environmental problems. The largest cities in the country, Baku, Sumgayit, and Ganja, have the greatest pollution problems. Baku became a large industrial center with diverse industries of local, regional, and FSU importance. Sumgayit and Ganja are examples of cities that were developed around specific industries in the late 1950s. Most of the populations of such cities were employed by these industries. Among industrial centers, the city of Sumgayit can be considered an extreme case of an environmental “hot-spot” (Box 5).

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<sup>7</sup> Before the collapse of the FSU, road traffic accounted for about 60% of soil pollution in urban areas. At present, this figure exceeds 85% because industries are operating below capacities.

### **Box 5: Sumgayit, an Environmental Hot Spot**

Sumgayit was founded in the 1950s as a center for the chemical and petrochemical industries. It quickly became one of the largest industrial centers of the FSU. Industrial areas occupied more than a third of the city, and about 88 large facilities were built, of which 10 became heavy air polluters. Annual air emissions were about 100,000 tons. Annual air emissions per square kilometer amounted to 1,200 tons in 1990–1991, while the average value for Azerbaijan was about 24 tons per square kilometer. Hazardous substances, including mercury, chlorine, hydrogen fluoride, and heavy metals, were released into the ambient air, affecting the local population, especially sensitive groups. Persistent organic compounds, such as dioxins and dibenzofuranes, were released from petrochemical industries. Soils around steel manufacturing plants in Sumgayit remain contaminated with mercury, benz(a)pyrene, lead, copper, zinc, molybdenum, and other chemicals, exceeding background concentrations more than 10 times. The most severe pollution problem is linked to the production of mercury as a byproduct in chlor-alkali production, reaching 1 kilogram per ton of chlorine. At present, about 300 grams of mercury per ton of chlorine are produced, compared with 2–3 grams per ton or even less in a well-maintained and controlled factory. The mercury produced is either emitted into the atmosphere, discharged with wastewaters, or discharged with industrial wastes. About 200,000 tons of mercury sludge, with 0.1–0.3% mercury content have accumulated since the 1980s. At the present level of production, mercury-contaminated wastes are accumulating at about 7,000 tons per year. The wastes are inadequately stored, heavily contaminating groundwaters and the Caspian Sea bed sediments through seepage. As a result, the city had one of the highest morbidity rates during the FSU period. In 1992, the city of Sumgayit was declared an environmental disaster zone. The city was later designated a free economic zone, in order to foster economic growth and the introduction of new technologies. However, partly because the processing equipment is outdated and in very poor condition, the problem of uncontrolled emissions, persistent pollutants, and the liability for the past pollution remain largely unsolved.

Source: Caucasus Environmental Outlook, 2002.

129. As a first remedial step, Sumgayit has recently developed a 5-year ecological program aimed at the environmental rehabilitation and restoration of the city and the closure of industrial sites. A treatment and storage facility for mercury sludge and hazardous waste is currently under construction, financed by the World Bank. A project to draw up an inventory of all industrial waste in the Sumgayit region is also under way. Several other projects related to industrial waste management in Sumgayit are under consideration, such as environmental impact assessments for all new industrial facilities in the region, including the development and application of ecological passports, and ensuring that environmental norms and standards are applied; introducing a technology for chlor-alkali production that does not involve mercury-containing substances; and a technology for the production of polyethylene pipes that does not generate harmful wastes.

## **6. Policy Objectives and Management**

### **a. Policy framework**

130. NPESSED identified the urgent need to improve industrial and municipal waste management, including the construction of landfills that meet health and environmental

standards. The following measures are planned: (i) creation of new landfills for hazardous industrial waste; (ii) use of advanced practices for sorting, disposal, and recycling of household waste; (iii) introduction of appropriate methods to generate biogas from municipal waste; and (iv) construction of waste incinerators to generate energy and development of compost from waste—MENR favors the construction of municipal waste incinerators to recover energy to produce electricity for urban settlements and is also interested in composting municipal waste; however, there is limited understanding of the scope of options available, or their compatibility.

131. A draft national hazardous waste management strategy submitted to the Government at the end of 2003 attempts to provide a policy and decision-making framework for the environmentally sound management of hazardous waste. The strategy aims at establishing a system for the collection, treatment, recycling, and disposal of hazardous waste according to international practice and standards. The strategy addresses both legal and institutional issues, including human resources and capacities for implementation, and public awareness. Should the strategy be adopted, special attention would be paid to (i) minimizing waste; (ii) reducing environmental hazards and risks in the process of handling hazardous waste; (iii) increasing reuse and recycling of hazardous waste; (iv) control over environmental performance of major generators of waste; and (v) building new facilities for the environmentally sound disposal and storage of various types of waste, including medical waste. NPESSED also calls for appropriate land-use planning that would help to improve urban planning practices and lower environmental stress on the urban population.

#### **b. Legal framework**

132. The Law on Industrial and Municipal Waste of 1998 addresses not only industrial and municipal waste but also radioactive waste, wastewater, and harmful gases. Most of the focus, however, is on industrial waste. The provisions of the law regarding municipal waste are limited and contained in article 12, spelling out the conditions for the construction of landfills (geological characteristics, distance from residential areas) as well as sanitation and hygiene-related environmental protection measures. The law is not yet supplemented by regulations, norms, or standards. Provision for enforcing the law is one of the main conditions for effective waste management improvement.

133. The draft national hazardous waste management strategy requires the introduction of new legislation and regulations to address a range of important issues, including the definition and classification of wastes, an inventory of contaminated sites and their rehabilitation, a reporting system, licensing, accident preparedness, and increased fines for noncompliance.

#### **c. Institutional framework**

134. The city governments are directly responsible for collection, transport, and disposal of municipal waste. Physical entities that generate hazardous waste are responsible for its treatment, transport, and disposal. MENR exercises general oversight of municipal and industrial waste management. Since the establishment of the Hazardous Waste Management Agency in 2003, MENR is responsible for the development and implementation of policies, enforcing the hazardous waste legislation, and monitoring and control over the sanitation and hygiene of municipal and industrial waste sites. The agency has developed and issues permits (passports) to the enterprises for the disposal of hazardous waste at specific sites. The passport serves as a reporting form for qualitative assessment and contains the following information: classification as per the Basel Convention, toxicity, general description and composition, chemical and physical characteristics, proposed treatment and use, and the names of the

company and person(s) responsible. Each type of waste should be accompanied by a separate passport. The passport does not provide information on the possible result of any interaction with other types of waste or with the environment.

135. The collection, treatment, and disposal of medical waste fall under the responsibility of MOH. The State Sanitary Epidemiology Service of MOH gives approval of the design of treatment facilities (such as incinerators).

## **H. Natural Disasters Management**

### **1. Water Level and the Coastline of the Caspian Sea**

136. The variation of the Caspian Sea water level is a serious problem for the country. Long-term variations in sea level have posed many complicated scientific, economic, ecological, and social challenges. During 1927–1977, the surface area of the sea decreased from 425,000 km<sup>2</sup> to 370,000 km<sup>2</sup>, which led to increasing development of the coastal territories and the construction of coast-protecting dams, channels, and roads, based on forecasts of further decreases in sea level. The sea level decreased from -25.58 m in 1901 to a critical—by ecological standards—level of -29.01 m in 1977. A reversal began in 1978 and during 1978–1995, Caspian sea level rose by 2.3 m to -26.5 m. This change caused concern in all nature protection institutions of the Caspian littoral states. The new rise has caused extreme erosion of coastal areas, destruction of construction and engineering facilities, and inundation of vast areas.

137. While some scientists predict a further increase in sea level of 1.5–2.5 m by 2010, a more rapid rise is predicted by others. Given the lack of scientific consensus on sea-level variation dynamics, the Government is not taking action to mitigate the consequences of sea level variation. Of immediate concern is the Lenkeran-Astaka region, which is already inundated.

138. The most severe environmental effects of the rise in the Caspian water level are associated with secondary pollution of the sea from oil fields and possibly some industrial plants, either through direct flooding or rise in groundwater levels. Oil pollution of the Caspian through groundwater seepage may already be significant. Of most immediate concern is pollution of the Caspian from the onshore Biby-Eybat oil fields on the outskirts of Baku. The soils in these fields are heavily polluted with oil, which may be seeping into the Caspian through groundwater. A barrier has been erected to protect large portions of the fields from the sea, but the Caspian has already flooded many oil-pump installations and oil-polluted soils at lower land levels. Large oil ponds on Artyom Island are also threats if the sea level continues to rise.

### **2. Flooding**

139. The annual variations in water hydrology are affected by two factors: atmospheric precipitation and snow. Annual precipitation generally increases with elevation up to 2,000 m above sea level, and decreases from west to east. The flow rates and water levels considerably increase in spring and summer, during intensive snow melting. Rivers that flow in areas with high precipitation and are fed by melting snow have high flow rates. The rivers that originate in high mountain zones of the Greater Caucasus, with permanent glaciers, have long flood periods, extending to 6 months each year. These rivers have one peak discharge period, whereas the rivers starting in the foothills of the Caucasus have two: in spring when snow melts and in fall after downpours. Floods are associated with the period of most intensive snow

melting. Below the confluence of the Kur and Araz rivers, floods frequently occur due to the combination of increased water level in the Caspian Sea and sedimentation in the river bed.

140. The Kur and Araz rivers form the largest flood areas. Their shores are supported by concrete dikes and levies to prevent material loss caused by floods. Water flow is regulated by reservoirs, such as the Mingechevir on the Kur, and Araz on the Araz River.

141. During the past 30 years, major floods have damaged large areas of infrastructure—roads, bridges, and water supply and sewage systems—and peri-urban and agricultural lands. Drought periods in the basin are very common. Despite efforts to manage river flow, Azerbaijan faces both floods and water shortages.

### **3. Earthquakes and Mudslides**

142. Azerbaijan is located in a seismically active area, part of the most active Alpine-Himalayan geological collision belt. Since 1800, more than 2,000 significant earthquakes have been recorded in the country, 1,200 of them in the last half of the 20th century. Baku is particularly prone to earthquakes. Of concern is that many of buildings of the FSU period were not built to withstand earthquakes of high magnitude. Often, however, damage caused by earthquakes may be more linked to the landslides they cause than to the actual earthquakes.

143. Mudslides are common in the mountainous regions of Azerbaijan. Average annual economic loss from mudslides is estimated at tens of millions of dollars. A population of more than 700,000 people, including those in secondary cities, is under mud-flow danger. The commonly used defense against mudslides is building protective barriers, but funding for such barriers is limited.

### **I. Human Health and Environmental Conditions**

144. Human health is affected by a broad spectrum of social, economic, sanitary, and environmental conditions. According to WHO, up to 80% of human morbidity in Azerbaijan is due to exposure to environmental factors of a physical, chemical, and biological character. The first criterion for setting environmental priorities should be the impact of environmental degradation on human health. Although it is very difficult to establish links between environmental pollution and morbidity rates, many health effects of pollution are now relatively well documented, from acute effects to chronic diseases and even death.

145. While industrial production has significantly declined, sanitary conditions have been rapidly worsening in the region since 1990. Outbreaks of infectious diseases, especially gastrointestinal, have become routine. Increasing numbers of epidemics of typhoid, dysentery, and viral hepatitis are observed in areas where they hardly ever occurred before. This is tracked to the worsening conditions of urban social infrastructure and its management—poor water quality facilitates transmission of such bacterial diseases as cholera and hepatitis. Water intake facilities are not properly protected and do not meet adequate sanitary and hygiene requirements. In many locations, the lack of chlorine prevents proper treatment of drinking water. Drinking water networks are dilapidated and subject to frequent cross-contamination with raw sewage. Overloaded landfills that do not meet health and environmental requirements, and illegal dumpsites cause the contamination of groundwater, which is the major source of drinking water in many of parts of the region. The absence of adequate solid waste management creates breeding places for stray dogs, rodents, and insects, spreading cholera, tularemia, and hepatitis and other diseases. Severe land degradation in environmental hot spots such as Sumgayit, has

been correlated with high mortality and morbidity rates. Although overall annual pollution loads in Sumgayit have declined in recent years, exposure to accumulated, persistent pollutants continues to pose a serious health risk, particularly for children, and lower children's intelligence quotients. The war with Armenia has displaced many people, giving rise to a greater incidence of disease in many places as urban social infrastructure and public services have become overloaded. According to recent social assessments in areas affected by the Caspian Sea water level rise, residents believe increased illness rates are largely associated with damaged drinking water supplies.

146. While data on the health situation and its causes are far from complete, the information available suggests that the leading danger to human health in urban areas is adverse environmental conditions caused by underdeveloped infrastructure and lack of maintenance of the existing reticulated water supply and wastewater systems, inadequacy of solid waste management, and unchecked environmental pollution from industries.

147. The Government is attempting, to the extent possible with limited funds, to track the outcomes related to environmental pollution: hospitalization related to respiratory diseases (bronchitis, asthma) and waterborne infections (typhoid, hepatitis, ascariasis, trikhosefalid, enterobioz), visits to first aid medical services, sick days, and untimely deaths.

148. The ability of state environmental and sanitary services to conduct proper inspections and enforce compliance to drinking water, wastewater, solid waste, and air quality standards/requirements has been sharply reduced in the last decade due to lack of funding. With continuing economic problems and lack of general management, the Government will not be able to solve these problems in the short to medium term unless assisted by focused external assistance.

## **1. Health Effects**

### **a. Air Pollution**

149. The link between exposure to air pollution and a broad range of health effects is well established. Poor air quality affects the pulmonary, digestive, cardiovascular, and immune systems. Exposure to lead also causes neuro-development disorders in children. In severe or extreme cases, it may cause genetic mutations. However, the lack of monitoring data and comprehensive studies on links between air pollution and health make it difficult to estimate the disease burden attributable to air pollution in the country.

150. The available information indicates that particulate pollution is of highest concern for human health. Documented studies on air pollution and health from the United States, Europe, and an increasing number of developing countries indicate that particulates, especially small particles (less than 10 micron in size, or PM 10 and PM 2.5), lead, and to a lesser extent SO<sub>2</sub>, are usually responsible for the largest health impacts associated with air pollutants commonly found in the urban environment.

151. MOH estimates of health impacts of particulate pollution in Azerbaijan and their social costs are presented in Table 7. These estimates are based on an annual average PM-10 concentration level of 100 µg/m<sup>3</sup> and an exposed population of 2 million people (i.e., 65–75% of the population in Baku, Sumgayit, and Ganja). The estimates indicate that each year particulate pollution causes 1,450–3,800 premature deaths and 9,800 new cases of chronic bronchitis and other respiratory problems. Based on studies in the United States and Europe, the cost to

society of these health impacts is around 3–4% of GDP. While these figures should be treated with caution due to the limited ability of the Government to conduct full-scale studies, epidemiological evidence from other countries indicates that in Azerbaijan, especially in its largest cities, there is a significant burden of morbidity and mortality associated with exposure to air pollutants emitted from stationary and mobile sources.

**Table 7: Estimated Annual Health Impact of Particulate Air Pollution (PM 10) in Azerbaijan**

	Number of Persons or Cases	Social Cost (\$ million)
Premature mortality	1,450–3,800	33–83
RHA	1,900	1
ERV	37,000	1
RAD in adults	600,000	18
LRI in children	95,000	5
Asthma attacks	500,000	2
RS in adults	1,900,000	10
Chronic bronchitis	9,800	50
TOTAL		120–170
% of GDP		3–4

ERV = emergency room visits; LRI = lower respiratory illness; RAD = restricted activity days; RHA = respiratory hospital admissions; RS = respiratory symptoms.

Source: MOH.

152. Very little information is available on indoor air pollution. The relatively high prevalence of smoking (26.5% of people older than 15 are estimated to be regular daily smokers) and the continued use of asbestos as a construction material represent the main potential exposures to well-known carcinogens.

### **b. Water and Sanitation**

153. The most serious water-related diseases are dysentery, typhoid fever, hepatitis A, and acute intestinal infections of known and unknown etiology. NEAP identified deterioration of water quality in both rural and urban areas, and the related increase in waterborne diseases, as one of the country's main environmental problems. The State Programme on Poverty Reduction and Economic Development for 2003–2005 also recognizes that one of the primary causes of morbidity and mortality in children is diarrhea, usually resulting from contaminated water, which contributes to aggravating malnutrition by reducing the capacity to absorb the few nutrients available.

154. Although, according to official statistics, the number of cases of such water-related diseases as dysentery and typhoid fever has generally diminished in recent years, these numbers may not reflect the reality, particularly among the poor and the very poor, who may not visit doctors as often as necessary. They could also possibly attribute the disease to other factors. MOH estimates that only 9–13% of families report diseases caused by water. It is known that groups of families who have daily access to clean water have a very low water-related disease burden. Clean water is becoming a privilege of the rich. The poor cannot afford filters and bottled water, and are becoming more disadvantaged.

### **c. Hospital Waste**

155. An important disease related to the safe disposal of infectious hospital waste and, in particular, the safe handling of blood and body fluid samples and the disposal of sharp items is hepatitis B. According to expert judgment, official statistics for hepatitis B may greatly

underestimate the magnitude of the issue (perhaps by a factor of 5–10), because cases diagnosed by private laboratory facilities are not reported to MOH. Most cases of hepatitis B occur among medical professionals. Vaccination programs for hepatitis B are virtually nonexistent, although a priority group has been identified among children born to mothers positive for the virus.

#### **d. Ionizing Radiation**

156. Radioactive contamination in residential areas in the vicinity of oil fields is a concern because it could, at least in theory, lead to leukemia or other diseases related to exposure to radiation, particularly in children. However, no studies have been carried out in Azerbaijan to assess this potential concern.

### **2. Policy Objectives and Management**

#### **a. Programs**

157. The only government program directly concerned with environmental health is NEHAP, which identifies the following actions: (i) revision of national standards, including partial harmonization with international norms, (ii) increase in public information dissemination and awareness, (iii) introduction of new technologies and systems, and (iv) installation of new water and sanitation infrastructure. NEHAP calls for financial support from international organizations and bilateral donors to carry out these actions.

#### **b. Legal Framework**

158. The key laws on environment and health in Azerbaijan are the 1992 Law on Sanitary-Epidemiological Services, which defines the function and operation of MOH and its Sanitary and Epidemiological Service, and the 1997 Law on Public Health. Other laws, codes, and decrees that relate to environment and health include the Law on Air Protection (2001), the Water Code (1997), the Law on Radiation Safety of the Population (1997), the Law on Food products (1999), and the Resolution of the Cabinet of Ministers on Obligatory Medical Diagnostics for Workers (1998). The legal framework needs revisions, particularly on national legislation on quality assurance standards, and on existing overlaps and duplications in relation to environmental monitoring responsibilities (e.g., in air quality monitoring).

#### **c. Institutional Framework**

159. The Sanitary Epidemiological Service of MOH controls and regulates, in terms of health impacts, drinking and recreational water (chemical and microbiologic quality), noise, and radiation, as well as workplace health and safety.<sup>8</sup> The quality and services of regional monitoring centers vary.

160. MENR monitors all industrial activities and facilities at source to determine their overall pollution impact. Both MOH regional monitoring centers and MENR inspectorates have the authority to inspect industrial, water treatment, and wastewater treatment facilities, carrying the

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<sup>8</sup> Based on agreements in the Commonwealth of Independent States, the monitoring of food, water, noise, and other products complies with the technical norms issued by the Russian Federation and adopted by the Azerbaijan Government, adjusted to take into account local factors.

risk of duplication, or worse, inconsistent findings. It is important that clear lines of responsibility are drawn and specific terms of reference be given to each inspectorate.

161. It no longer monitors air pollution from transport and ambient noise. MENR undertakes air quality monitoring but the monitoring system is not primarily designed to assess health effects. It would be useful for MENR to work with MOH to examine the effects of air quality on human health.

162. Health assessment for new projects is carried out by MOH independently of MENR, which also plays a role in granting permits or passports on the basis of environmental impact assessment. Even though the two ministries have different responsibilities and address different aspects of the potential issues posed by a new project, there is a risk of overlap of their assessments.

163. The institutional capacity of the public health sector needs to be strengthened, particularly in interagency coordination, standard setting, pollution monitoring, data collection, and information management.

## **J. Policy, Legal, and Institutional Framework**

### **1. Legislation**

164. Azerbaijan inherited a relatively well-developed system of environmental laws, regulations, and institutions from the FSU. The Law on Normative-Legal Acts stipulates that all acts in force prior to independence that were not subsequently cancelled and do not contradict the Constitution remain in force. Although necessary for the transition period, this law has resulted in a complicated mix of old and new regulations. Since independence, Azerbaijan has initiated a number of steps to develop an environmental policy in line with the transition to a market economy. An environmental law "On Environmental Protection and Utilization of Natural Resources" (1992), introduced new principles related to

- establishment and development of the Environmental Impact Assessment Program;
- "contaminator pays" principle;
- necessity to review existing ecological standards and harmonizing them with international standards;
- necessity for economical mechanisms to control environmental degradation;
- necessity for improvement of the system of ecological awareness and education;
- necessity for intensification of cooperation with regional and international organizations in environmental protection; and
- necessity of improvement in environmental monitoring.

165. The comprehensive "Law of the Republic of Azerbaijan On Environment Protection" (1999) identifies the legal, economic, and social bases of environmental protection. The objectives of the law are to prevent negative impact of industry and other activities on ecological systems, preserve biological diversity, and ensure proper use of natural resources. The law requires development of market-based instruments for pollution control and pollution charges; specifies rights and duties in environmental protection of the state, citizens, and social unions; and stipulates adoption of an environmental standards system in line with EU recommended standards of a broad range of issues. The law addresses

- environmental impact assessment;

- environmental protection control (enforcement);
- responsibilities for violation of legislation on environmental issues and dispute settlement;
- the state ecological audit and its implementation;
- standardization and certification of environment, natural resources, cadastre, and monitoring;
- requirements for industrial activities;
- education, research, statistics, and information dissemination on ecology and environmental protection;
- emergency situations and ecological disasters; and
- international cooperation on environmental protection.

166. The responsibilities of nongovernment organizations (NGOs) in terms of environmental protection consist of the implementation of their duties in compliance with the regulations (Box 6).

**Box 6: Article 7 of the Law of the Republic of Azerbaijan On Environment Protection: “Rights and duties of NGOs in terms of environmental protection”**

The rights of social unions in terms of environmental protection are

- to develop and implement their own ecological programs and protect the rights and interests of people in terms of environmental protection, thus involving them in related activities;
- to provide public control over environmental protection;
- to get precise, detailed and updated information from state bodies and institutions on conditions and measures taken toward rehabilitation of the environment;
- contracted cooperation with international organizations and state bodies in implementation of certain works, as specified by the environmental protection law;
- to participate in negotiations on the draft laws on environmental protection;
- to demand temporal or permanent termination of activities of an enterprise that affects the environment and human health, and limitation of activities, location, construction, reconstruction, and operation of enterprises, buildings, and installations that are hazardous from an ecological point of view;
- to raise questions regarding lack of commitment and application of legal actions;
- to bring to a court the claims of defendants endangered by violation of environmental protection regulations, which caused health and property damage.

167. Other major legal documents are the Water Code (1997) that regulates the use of water bodies, the Law on Air Protection (2001) that establishes the legal basis for the protection of air, and the Land Code (1999). Other relevant laws have been recently adopted, among them laws on environmental safety, water supply and wastewater, and industrial and municipal waste. The list of environmental laws is presented in Appendix 4; recent changes are shown in Appendix 5. The list of recently adopted laws is impressive, but the legal framework is not yet comprehensive enough to cover the full scope of issues of concern. For example, activities regulating the use of the Caspian Sea are still guided by instructions adopted from international practice or from internal guidelines of specific companies present in the area (such as British

Petroleum). Although new principles have been introduced in the legislation, the appropriate mechanisms for using the legal basis are still largely missing. The regulatory basis, for the most part, still needs to be developed. This should include the development of MPCs based on human health and ecological impacts, relevant discharge permits, and an appropriate penalty system. Regulatory tools include economic instruments, monitoring and evaluation instruments, impact assessment instruments, and environmental management instruments applied in organizations.

168. There have been claims by some international NGOs that some of the above laws were based on political decisions rather than on environmental concerns.

169. Following the creation of MENR in 2001, its legal department is responsible for preparing new environmental laws and regulations. The legal department of MENR consists of a group of professional lawyers highly dedicated to their work. However, the effectiveness of the laws is limited due to the need to develop detailed regulatory documents supported by scientific data. The necessary scientific data are requested from state institutes, which are underfunded and often lack necessary equipment to gather the data. As an example, the MPCs on atmospheric air pollutants and municipal waste collection disposal standards are still absent, hampering the implementation of relevant laws. Other ambient standards need review and revision. The department currently plans to develop new laws, such as on the Caspian Sea. Some laws are overlapping. Among the urgent plans of MENR is the unification of legal statutes relating to solid waste collection and disposal, and the disposal of waste from oil production.

170. There has been limited exposure and cooperation between the environmental lawyers and technical experts involved in the development of relative ambient standards and their colleagues from other, nontransition, countries. Thus, there may be merit in claims that existing environmental laws and regulations are largely still based on FSU approaches, and they need review and revision to accommodate market realities. The MENR legal department would also be much more efficient if their lawyers were able to discuss the issues with colleagues from the other transition economies, such as in Central Asia, which experience similar problems. The department's staff would benefit from having access to relevant legal courses and reference literature.

## **K. Policies, Programs, and Government Priorities**

171. The "Ecological Concept of the Republic of Azerbaijan" developed in the early 1990s by the State Committee for the Environment, specifies selected priorities and general directions for environmental protection: (i) protection of the biosphere, (ii) sustainable utilization of natural resources, (iii) decrease in and disposal of waste, (iv) rational use of energy, and (v) reduction of risk associated with human activity.

172. In order to realize these principles, NEAP was developed in 1998, with the aid of the World Bank. The major identified environmental problems requiring urgent action include industrial pollution, mainly from oil exploration and production; poor water quality; degradation of fertile agricultural land; threats to protected areas leading to losses in biodiversity; damage to the Caspian coastal zone from flooding due to the rise in sea level and pollution; natural deterioration of the cultural heritage; and the threat of irreversible reduction and extinction of sturgeon species, triggered by loss of reproductive capacity, oil pollution, and overfishing.

173. Against the background of these challenges, NEAP has the following objectives: the cleanup of oil contaminated land, efficient refinery waste management, oil spill prevention and

contingency planning in the Caspian Sea, improved pollution monitoring in the coastal zone of the Caspian Sea, reduction of natural gas discharges into the atmosphere, mitigation of mercury emissions from industrial sources, mitigation of air pollutant emissions from power plants, and forest and biodiversity conservation.

174. According to the conditions of the environment and the geophysical and social characteristics of the various geographic areas, the territory of Azerbaijan may be classified into the following categories:

- areas requiring urgent environmental abatement action—the Apsheron Peninsula with Baku and Sumgayit cities, and the Kur River with Ganja, Mingchevir, and Ali-Bayramli cities, which together hold more than 70 % of the country's population;
- areas with acute environmental pollution control needs—Nakhchivan and practically all of the Kur-Araz lowlands, with a total (mostly urban) population of 315,000; and
- areas with significant environmental problems—the rest of the country.

175. The main natural environmental components and sources of contamination and degradation are listed as

- water resources—industry, agriculture, municipal domestic sector, energy (including heating), recreation;
- ambient air—industry, mainly petrochemistry, mobile (vehicular) sources, municipal domestic sector;
- land resources—agriculture, industry, water supply system, town planning activity, transport, engineering infrastructure, recreation; and
- flora and fauna—agriculture, recreation, transport, engineering infrastructure, and industry.

176. NEAP has recommended immediate action to eliminate overlapping responsibilities among environmental management agencies and separation of environmental regulation and control from production activities.

177. NEAP also recommended that critical investments be made in strengthening agencies' capabilities, such as physical investments in monitoring and laboratory equipment and in staff training. The pollution charge system should be revised on a regular basis to account for inflation, improved collection capabilities, and more efficient use of funds for environmental management purposes.

178. If fully financed by the state, NEAP would require up to 3% of state budget expenditures within 1–2 years. Funds would need to be provided either from other budget lines or from other sources. Indeed, NEAP notes that financing should be sought from a combination of the Government of Azerbaijan, international donors, and private enterprises, but is not more specific.

179. It is not surprising that, after 5 years, only a small percentage of the activities (around 20%) listed in NEAP have been accomplished. In general, there has been almost no environmental progress in the economic sectors, including the prevention of new pollution and the cleanup of old pollution. Some of the NEAP policy elements have been achieved, particularly with regard to new legislation, but many of the implementing regulations and by-laws are lacking. The most significant change was institutional: Azerbaijan established MENR.

180. Other than financing, a significant obstacle to implementation has been the lack of more specific prioritization. The current categories of "top priority" and "priority" do not provide sufficient guidance for the distribution of limited resources.

181. While NEAP is comprehensive in identifying environmental issues, causes, and prescriptions it is not clear to what extent the human health and environmental conditions of the population, both urban and rural and particularly the poor, have been considered.

182. Even with these limitations, NEAP has had a very positive effect on the development of environmental and natural resource protection, thus proving its value as a policy instrument. A second generation of NEAP could be prepared as early as end-2004.

183. The State Program on Poverty Reduction and Economic Development (SPPRED), approved by presidential decree on 20 February 2003, is envisaged to play a significant role in the medium term as a comprehensive strategy with a multisectoral approach. It will influence the environment sector within the context of overall national priorities.

184. Fifteen sectoral working groups, with members from government institutions, NGOs, and civil society, were established to prepare the final document. SPPRED, supported by international experts, was established in MOED.

185. SPPRED covers a period of 3 years (2003–2005) and is revised annually as the envisaged policy measures are implemented and yield results. Among other things, it addresses the role of environmental conditions as a cause of poverty as well as a tool to reduce it. Based on the assumption that "economic development which upsets the environmental balance cannot be sustainable," it obliges the Government to promote balanced growth and to bring about improvements in some of the key economic sectors and to improve the environment.

186. In particular, SPPRED recommends addressing the following with public finances:

- Clean up mercury sludge and improve waste management.
- Reconstruct the water purification units and the sewerage system in Sumgayit, expand the purification facilities in Baku, and finish construction of new facilities in Ganja.
- Treat the contaminated water discharged from the Zykh and other lakes into the Caspian Sea.
- Reclaim oil-polluted soil in the Apsheron Peninsula.
- Treat radioactive waste in the coal storage facilities at Ramany, and New-Surakhany and Neftchala iodine-processing plants.
- Enforce environmental protection through better monitoring of environmental indicators.
- Carry out administrative reforms to improve management.
- Provide regional laboratories with the necessary equipment for monitoring.
- Involve municipalities and communities in the assessment of the environmental impact of regional economic development projects.
- Improve waste collection and disposal, and rehabilitate sewage systems at municipal levels, taking advantage of best available technologies at affordable costs to introduce recycling practices and reduce water and soil contamination.

187. SPPRED, however, fails to set priorities and does not provide an assessment of costs and benefits. MENR should complete the program by developing concrete projects and plans for each of the objectives and rank them on the basis of common criteria. The program does not give any instruction on the methodology to be applied.

188. MENR also prepared NPESSED, which covers the environmental aspects of the country's overall development strategy. It determines the main areas of sustainable development and includes a plan of action for 2003–2010 "to address the initial phase of the resolution of the current problems."

189. The action plan identifies actions, the main implementing agencies, and the timelines for a range of sustainable development issues. While NPESSED is a good national-level strategic document, it does not include cost estimates or measures for financing. Consequently, its performance will depend on the development of projects that are able to attract funding from a variety of sources and on sector-specific plans. This includes the preparation of a second NEAP and, possibly, local environmental action plans.

190. Azerbaijan's Partnership and Cooperation Agreement with the European Communities has been in force since 1999. This agreement represents another strategic document that effectively creates a set of international obligations on Azerbaijan, including those related to the environment. One of these is harmonization of Azerbaijani environmental legislation with that of the EU. If enforced properly, this will result in a far-reaching overhaul of the whole system of environmental protection in Azerbaijan. NPESSED states that developing regulations meeting European standards is one of the important conditions for meeting sustainable development goals.

191. The MOED recently prepared the Five-year Plan for Socio-Economic Development of Regions of Azerbaijan for 2004–2008 that specified a number of urban environmental initiatives, particularly in the areas of water supply and wastewater management, in a number of cities and towns (Appendix 6). This work coincided with the election of a new president of Azerbaijan in late 2003, after nearly the decade-long leadership of the previous president, Mr. Heydar Aliyev. The new presidential administration is showing interest in pursuing environmentally sustainable development. One of the first decrees<sup>9</sup> of the new President, Mr. Ilham Aliev, on Measures to Accelerate Social and Economic Development of the Republic of Azerbaijan (Appendix 7) called on the Cabinet of Ministers to study the course of implementation of the state programs adopted during recent years on development of various fields of the economy, including on "ecologically stable social-economic development in the Republic of Azerbaijan."

192. However, the restraining issue is the ability of the Government to allocate adequate funds for environmental protection. According to government statistics, total government and private sector environmental expenditures averaged about \$13.5 million per year during 1992–1995, or less than 0.4% of GDP. About 57% of the expenditures were on water resources, mainly water and wastewater treatment, and about 27% on air pollution control. Most of this money was spent on operating and maintaining existing water and wastewater treatment and air pollution control systems, although some new investments were included. The current level of environmental expenditures is inadequate to address the major environmental problems in Azerbaijan, and is not even enough to operate and maintain existing waste treatment and pollution control systems properly. According to NEAP, a reasonable target for environmental expenditures would be 1% of GDP, or about \$45 million per year.

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<sup>9</sup> 26 November 2003

## **L. International Programs and Agreements**

193. Since the late 1990s, Azerbaijan has participated in the Caspian Sea Environmental Program, which was established with the consent of the five riparian states (Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan) in 1995. It is supported by the United Nations Development Programme (UNDP), TACIS, World Bank, USAID, and other international financial institutions. The main missions of the program are to provide long-term environmental guidelines and to secure sustainable development in this context. The major outputs of this program are the establishment of the Caspian Centre for Pollution Control and the development of a geographic information systems-friendly database.

194. Another regional structure in which the Government of Azerbaijan and national NGOs participate is the Regional (South Caucasian) Environmental Center (REC). It aims to strengthen and broaden intergovernmental as well as NGO cooperation in tackling environment-related problems and ensure sustainable development. Azerbaijan holds the view that regional cooperation in the South Caucasus is impossible until the conflict between Azerbaijan and Armenia is settled. Therefore, cooperation with Armenia is excluded from the REC.

195. The Republic of Azerbaijan is a full member of 15 international environmental conventions and most of the international environmental organizations. The country has ratified the following conventions:

- Convention on the Protection of World Cultural and Natural Heritage (1993).
- United Nations Framework Convention on Climate Change (1995).
- Montreal Protocol on Substances that Deplete the Ozone Layer (1996).
- Helsinki Convention on Trans-boundary Watercourses and Protection and Use of International Lakes (1992).
- Convention on Wetlands of International Importance Especially as Waterfowl Habitats (Ramsar Convention) (2000).
- Convention on International Trade in Endangered Species of Wild Flora and Fauna (1998).
- Convention on Biological Diversity (2000).
- European Convention on the Conservation of European Wild Life and Natural Habitats (1999).
- Convention on Environmental Impact Assessment in a Trans-boundary Context (1999).
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice on Environmental Issues (Aarhus Convention) (1999).
- Basel Convention to Control of Trans-boundary Movements of Hazardous Wastes (2001).
- Convention on Combating Deforestation (1998).
- International Plant Protection Convention (2000).

## **M. Environmental Institutions**

196. During 1991–2001, the key environmental agency was the State Committee of Ecology and Control of Natural Resource Utilization (SCE), under the office of the President. The SCE supervised the observation of all standards and requirements in the field of environmental protection and exercised state control over the status and utilization of natural resources.

197. Based on the new environmental impact assessment (EIA) regulations, the Ecological Expertise Department screens all EIAs (Box 7). This department's responsibility is to ensure expert evaluation of and public participation in the review process, and decide whether specific developmental activities should proceed, or revisions be made, or a project halted. The Enforcement Inspectorate, through local, district, and municipal, departments, imposes pollution fines on persons and official bodies.

198. In May 2001, the SCE and the state committees on geology and mineral resources and on hydrometeorology ceased to exist and MENR was established in their place by Decree of the President of the Republic of Azerbaijan dated 23 May 2001.

#### **Box 7: Impact Assessment Instruments**

Environmental impact assessments (EIAs) are applied under the state ecological expertise (SEE) procedure. An EIA, as a part of SEE, is required for development activities. However, the EIA legislation does not provide specific screening project categories. MENR decides whether a project requires a full EIA, no EIA, or something in between.

Normative documents on the conduct of EIA are in force: the 1990 FSU Instruction on the Procedure of Estimation of EIA for Feasibility Studies and Projects, and Construction of Economic Objects and Complexes, and the 1996 Handbook for the EIA Process.

The regional departments of MENR receive applications and ensure that adequate information has been provided. Where an EIA is required, documentation is sent to the head office of MENR. MENR decides within 1 month on the extent of the EIA required, based on initial public enquiries within the locality of the proposed development and consultations with experts. For projects requiring a full EIA, MENR organizes and chairs a scoping meeting of representatives of the applicant, invited experts, and invited members of the public.

199. MENR is a central executive authority responsible for carrying out state policy on environmental protection, regulation of the use of nature, groundwater, raw mineral deposits, surface natural resources, rehabilitation of natural resources, and the observation and forecasting of hydrometeorological processes within the territory of the Republic of Azerbaijan, including the Azerbaijan sector of the Caspian Sea.

200. MENR carries out its activities directly as well as through its local bodies, subordinate enterprises, organizations, and other institutions. These activities are carried out in coordination with other central and local executive authorities, local self-governing bodies, and public organizations.

201. The main responsibilities of MENR are

- to carry out state policy on the exploration of natural resources, and their use, rehabilitation, and protection; and the provision of environmental safety and conservation of biological diversity;

- to carry out state policy on a sustainable use of aquatic biological resources, and their protection and reproduction in internal waters and the Azerbaijan sector of the Caspian Sea;
- to carry out state policy on geological exploration, protection of subsoils, and sustainable use of raw mineral resources in the Republic of Azerbaijan;
- to prepare and implement in a relevant manner state programs on the use, rehabilitation, creation, and protection of forests, and management of forestry activities;
- to prepare and implement relevant national action programs on environment and the use of natural resources;
- to prepare and implement within its authority state programs on the use and protection of water bodies;
- to carry out state governance in relation to environmental protection and the use of natural resources to ensure the right of the population of the Republic of Azerbaijan to live in a healthy environment;
- to organize a hydrometeorology service, provide hydrometeorological observations, prepare forecasts, and disseminate the information;
- to carry out state control with regard to environmental rehabilitation and protection of soils as well as the protection of atmosphere in the course of use of natural resources, minerals, vegetation cover, flora (including forests), fauna (including aquatic fauna), sources of water, and energy; and
- to ensure the fulfillment of relevant international commitments within its authority and coordinate activities of other bodies in this area.

202. MENR is subordinated to the office of the President of the Azerbaijan Republic. It has a relatively small central administration of about 50 professional and administrative staff; 29 local, district, and municipal, departments, with a total staff of 520; and 34 specially protected areas (14 strict nature reserves and 20 conservation areas [Box 8]), and 2 hunting reserves, with a total staff of 440. In 2002, the Scientific-Technical Council was established within MENR. The council is charged with preparing recommendations on the use of raw mineral resources and other natural resources, and discussing the implementation of activities concerning the development of geology, ecology, hydrometeorology, environmental protection, forestry, and fishery.

### **Box 8: Nature Protection Reserves and Conservation Areas**

Designed to provide different degrees of protection, the country's ecosystems protection network consists of state nature reserves, conservation areas, and state hunting areas.

Although the nature protection reserves (total of 14) are unevenly distributed over the country, they cover all the main geophysical areas, serving to protect both land and water habitats. Special attention is being paid to the protection of Kizil-Agach Bay in the Caspian Sea, steppe lakes (Ag-Gel and Shirvan), mountain lakes (Gey- Gel), water reservoirs (Girkan), and river ecosystems. All economic activities, including hunting, logging, animal trapping, and gathering plants and fruits, are barred within the reserves.

The conservation areas (total of 20) are considered "temporary" means, in which certain species of animals and plants, geological objects, or types of landscape are preserved. Unlike nature reserves, forestry, agriculture, and other commercial practices are allowed within the protected area, usually for a certain period of time or a season, as specified in the document establishing the conservation area. Certain commercial activities are allowed on the basis of assessments proving lack of adverse environmental impacts from the activities. The total area covered by conservation areas is more than 260,000 hectares. The first area was established in 1923 (the Kara-Yaz-Akstafa), and the last in 1993 (Gabala). Conservation areas are viewed as considerably supplementing the protection reserves for preserving the ecological heritage of the country.

## **N. Environmental Monitoring and Enforcement**

203. One of the main goals of MENR is to provide a national monitoring service (NMS) to guarantee a universal system for monitoring the ecological state of Azerbaijan and carrying out comprehensive research. The task of this service, established in late 2001, is to provide detailed monitoring on the basis of multilateral data on the country's flora and fauna, including meteorological research and preventing pollution of the environment. The objectives of the NMS are establishment of

- a monitoring network of baseline information on ground and surface natural waters (including the Caspian Sea), soil, atmosphere, pollution of atmospheric precipitation (rain, snow), and radiation in the environment;
- a systematized monitoring network for transboundary pollution of transit rivers and transboundary water bodies;
- a network for monitoring biodiversity and the condition of vegetation cover (including forests) and animal species;
- a monitoring and analysis system for extreme pollution accidents resulting from natural disasters and anthropogenic causes; and
- automated information gathering, analysis, storage, and sharing.

204. MENR envisions Azerbaijan joining the Global Monitoring System, which was established in 1974, as a mid-term prospect.

205. MENR is led by Husseingulu Baghirov, a former minister for trade who has since proved to be an energetic leader. MENR actively participates in the implementation of international and regional programs and projects. Presently, several projects are being implemented and/or discussed under multilateral support from GEF and the World Bank, and bilateral support

(France, Germany, Japan, Netherlands, and US). MENR actively seeks international partners in addressing the country's environmental issues.

206. A State Environment Protection Fund had been established under the State Committee for the Environment, currently functioning under the auspices of MENR. It was funded from fines imposed on polluters and payments for natural resources utilization.

207. While MENR has primary responsibility for environmental management, other ministries and committees also have important functions that directly relate to those of MENR. These include, in particular, MOH, Ministry of Agriculture, Ministry of Economic Development, Ministry of Fuel and Energy, State Committee of Amelioration and Water Management, and other state committees (standardization, industrial safety).

208. The Cabinet of Ministers is officially responsible for coordinating government agencies. However, there are no mechanisms for coordination and integration at the working level. This is especially a problem for implementation of key programs. There is the danger, for example, that MENR is expected to implement NPESSED and NEAP on its own.

209. The state design institutes are in charge of developing regulations on permissible standards for discharges for newly established enterprises. These regulations are to be approved by the SCE for the environment. Standards of permissible discharges are reviewed every 5 years and may be changed in accordance with changes in technological processes and changes in the environment. The documents submitted for receiving a license are to include detailed information about the location of and estimates of expected discharges of contaminants. If the enterprise does not have approved standards, all discharges are considered to be above the standards and the fines increased tenfold.

210. However, environmental and other authorities responsible for environmental regulation, monitoring, and enforcement do not seem to have enough resources or influence to act. There are several problems in each field. While in theory the operation of the enterprise may be suspended if discharges do not correspond to the adopted standards, this has not happened.

211. The current environmental monitoring and enforcement capacity in Azerbaijan is all but defunct. The country still lacks legislation and practical experience related to environmental monitoring, enforcement, and damage, including liability, compensation issues, and public court suits. Importantly, Azerbaijan lacks finances to develop modern compliance assurance monitoring and control systems. In the absence of state funds for the environment, the near collapse of the charge system has eliminated the primary source of financing for monitoring and enforcement. Administrative penalties imposed on violators, including permit conditions, are symbolic, while wastewater and air industrial emission charge rates are set at low levels, not taking into consideration marginal abatement costs of industries—all of which encourages polluting activities. Obsolete monitoring equipment and lack of transport and trained personnel severely constrain the ability of the local authorities to act. It is generally perceived that the authorities do not react to mitigate environmental concerns; and the public in general lacks information, understanding, organization, and effective means to promote the enforcement of pollution control and cleanup. The enforcement of existing pollution control laws and regulations is the responsibility of the local environmental authorities, assisted by the State Control Inspectorate for Environment and Natural Resources Use of MENR.

## **O. External Assistance**

### **1. ADB Sector Priorities**

212. ADB's assistance strategy stresses the importance of sound management of natural resources and protection of the environment to promote sustainable development. Currently, emphasis is given to addressing environmental concerns relating to ADB projects in the pipeline. In terms of addressing specific environmental issues, ADB, in its proposed assistance for flood mitigation, will assist in addressing land degradation issues and inefficient watershed management. A country environmental analysis, undertaken in 2004, reviews the Government's environmental policies and recommends areas for possible ADB assistance.<sup>10</sup>

213. ADB's progress to date in addressing urban environmental issues is modest. In the water supply and sanitation sector, ADB approved a project preparatory technical assistance to assist the Government to identify and prepare an investment project to rehabilitate water supply and sanitation services.<sup>11</sup> The project will improve the living and health conditions of people in three secondary towns of Azerbaijan through better access to a safe water supply and sanitation services. In addition, an advisory technical assistance for 2004 is to strengthen the capacity of the Government in the efficient regulation of water supply and sanitation services, and to promote integrated water resources management.

### **2. Other External Assistance**

214. Over the last decade, Azerbaijan has received a high level of international assistance, including assistance on environmental issues. The decree in November 2003 of the President of Azerbaijan on Measures to Accelerate Social and Economic Development of the Republic of Azerbaijan (Appendix 7) called on the Ministry of Economic Development to "ensure conducting purposeful work in the sphere of further expanding the country's cooperation with international and regional financial and economic structures." Following are the external assistance activities related to urban environmental issues so far.

215. USAID is financing integrated water resources management activities within the Caucasus region. Currently, it implements the Water Management of the South Caucasus project to strengthen water resources management in the Kur-Araz river basin, based on integrated river-basin water resources management principles. The immediate goal of the project is to strengthen cooperation among water-related agencies at the local, regional, and national levels. In parallel with this, TACIS launched the Joint River Management Program on Monitoring and Assessment of Water Quality on Trans-boundary Rivers, aimed at the prevention, control, and reduction of transboundary pollution. The program covers four basins, including the Kur river basin. In addition, regional organizations, such as the Regional Environmental Center for Central and Eastern Europe (REC) and Eurasia Foundation, as well as numerous local foundations, promote national and regional activities in the field of water resources management and protection.

216. The World Bank assisted in the development of NEAP and the creation and strengthening of MENR. The World Bank has also made short-term improvements to the Baku water supply through its Baku Water Supply Rehabilitation project, and provided the basis for

<sup>10</sup> ADB.2003. *Regional Technical Assistance for Integrating Environmental Considerations into Government Policies, Plans and Programs*. Manila.

<sup>11</sup> ADB.2001. *Technical Assistance to Azerbaijan for Urban Water Supply and Sanitation*. Manila. The three towns are Goychay, Agdash, and Nakhchivan.

longer-term planning and recovery of the system as a whole through demand management; supply, operations, and maintenance improvements; and institutional capacity building. The World Bank is currently conducting a study for a proposed Kur River Delta Rehabilitation project. The project is aimed at clearing the main channel of the Kur River delta in order to allow access by the sturgeon population. The World Bank is also currently implementing the Mercury Cleanup Demonstration project in Sumgayit (Box 9).

217. The IMF is pursuing initiatives aimed at improving access to safe drinking water and sanitation and increased reliability of the services, including the promotion of private sector participation, and developing unhindered access to water and wastewater services, especially for the poor. The last target will include measures on raising collection rates, revision of tariffs for various population groups, and reduction in and elimination of unwarranted subsidies.

218. The Japan International Cooperation Agency (JICA) provided support for the development of an environment master plan in Baku. Kreditanstalt für Wiederaufbau (KfW) is carrying out a study for the establishment of two national parks, in the northeastern and northwestern regions of Azerbaijan. The World Bank is planning a similar project. UNDP provided support for the establishment of an environment center and the environmental rehabilitation of Sumgayit. The environment center is distributing information, increasing public awareness on environmental monitoring and damage assessment, and operating the respective databases.

219. Subject to approval of the Government, EBRD will provide support for the development of a national oil spill contingency plan. UNDP, TACIS, World Bank, and USAID fund Azerbaijan's participation in the Caspian Sea Environmental Program that supports regional environmental sustainability initiatives. TACIS financed the rehabilitation of oil-contaminated land.

220. UNDP assisted in the development of new EIA regulations. UNDP is also assisting the Government in preparing Azerbaijan's first response to its commitments under the Convention on Climate Change, and preparing projects to assist Azerbaijan in meeting commitments under the Montreal Protocol. The Office of the United Nations High Commissioner for Human Rights is addressing problems of asbestos in building materials by the use of non-asbestos materials in all new construction work and by sealing and securely storing all asbestos-containing waste until a proper final disposal facility is available. TACIS is providing assistance for priority actions to strengthen the legal framework for environmental management, including harmonizing with international protocols for the purpose of ratifying conventions. MENR is supported by the GEF and World Bank, and receives bilateral assistance from France, Germany, Japan, Netherlands, and US.

221. Thirteen years after the collapse of the FSU, Azerbaijan continues to adjust to the new challenges and responsibilities of an independent state. While the Government fully acknowledges its environmental problems, it blames them on the Soviet legacy of exploitation of natural resources and neglect of Azerbaijan's infrastructure.

### **Box 9: Mercury Cleanup Demonstration Project**

The International Development Association (IDA), a member of the World Bank Group, has provided credit to the Azerbaijan Government to implement a mercury cleanup project at a chlor-alkali plant in Sumgayit, the construction of a hazardous waste landfill site, the reconstruction of an access road and canal bridge, and the transportation of contaminated materials to the landfill. As this is a demonstration project, strong emphasis will be placed on training in the technical and health and safety elements of the project. The landfill will represent the first phase of development of a national hazardous waste disposal site. The site has been designed to contain a wider range of wastes than will be produced by the project. The filling of the landfill, and subsequent operations, will become the responsibility of a newly established organization. The crucial element of the projects will be the development of effective hazardous waste transportation.

## **P. Issues Restraining Environment-Friendly Development**

222. Solving environmental problems requires a functioning relationship between the partners from government, general public, NGOs, and business. The Government has been slow to embrace the principles of democracy and a market economy, while society has been slow to demand them. Azerbaijan is subject to continual government surveillance. Human rights abuses and retribution for protesting contribute to an atmosphere in which open debate of environmental issues is difficult. With lack of information about environmental issues, public awareness of the state of environmental pollution and the urgency of improvements is low. The scientific environmental community, concentrated largely in scientific and academic institutions, is limited and diminishing. NGOs could possibly become champions of environmental issues. However, Azerbaijan's authoritarian Government discourages dissent and does not support a free press. Despite government obstacles, NGOs, with assistance from international institutions and western countries, have established a foundation for public advocacy and political reform. While the Government does recognize the important role NGOs play in delivering the bulk of the humanitarian assistance to those displaced by the Nagorno-Karabakh conflict, their role as environmental advocates still has to be established. However, there are indications of certain positive developments in educating the public on environmental issues, particularly with the establishment of the MENR. A further step in the development of a functioning relationship between the concerned stakeholders was the establishment of the Environmental Information Center (Box 10) in Baku in 2003 as a measure to ensure freedom of environmental information.

223. The economic distress experienced by Azerbaijan since 1991 has made it difficult to allocate appropriate levels of environmental financing. The current projected growth in GDP and government revenues due to oil production could significantly increase the funds available for the most urgent environmental protection and improvement expenditures. However, while growth is apparent in Baku as a result of the oil industry development, the economy outside the capital remains stagnant. Billions of dollars resulting from signed oil contracts have had little trickle down effect on the general population. In the assessment of some analysts, the lack of state revenue, in a country where most of the working population takes home less than \$100 a month, means that environmental cleanup will start late and will not be the Government's priority. The Government might also seek to shift responsibility to foreign oil and gas companies or to international development banks in order to fund cleanup efforts. Azerbaijan has one of the

most corrupt governments in the world (in 1999 only 3 were worse) and it is still unclear whether adoption of a free market economy will help or hinder Azerbaijan in overcoming its legacy of Soviet and post-Soviet pollution.

224. Another restraining issue is the regional character of water pollution issues, in particular, the inability to overcome hostilities and the armed conflict with neighboring Armenia over the last decade, effectively excluding gainful regional cooperation.

**Box 10: Azerbaijan's Environmental Information Center**

A public information "Aarhus" center to promote public access to environmental information and encourage participation in decision making in environmental affairs was opened in September 2003 with the assistance of the Organization for Security and Cooperation in Europe. The Aarhus center provides government, scientific, and nongovernment organizations (NGOs) engaged in environmental activities with free access to a library, Internet, and conference room facilities. The center will serve as a link between those interested in environmental policymaking and implementation in Azerbaijan.

The center is run by a board of experts representing civil society, supported by an advisory board composed of representatives of the donor community and diplomatic missions. It is envisaged that the center will also serve as a venue for public discussions, NGO meetings, and public relations activities of the Ministry for Ecology and Natural Resources (MENR).

In 2002, MENR established a public council, which begins operations in 2005. This idea came from the NGO Forum. The council is expected to take an active part in the preparation of state programs for ecological policy and for ecological reserves, proposals, and projects implemented by international humanitarian and ecological organizations active in Azerbaijan, and to join strategic ecological programs and study the ecological situation in the region.

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## BASIC COUNTRY STATISTICS

### Social and Demographic indicators (2000)

Area (km <sup>2</sup> )	86,600.0
Population ('000)	8,202.5
Urban population (%)	51
Rural population (%)	49
Annual population growth rate (%)	0.8
Life expectancy at birth (year)	72
Infant mortality rate (per 1,000 population)	12.8
GDP per capita (\$, at average 2002 exchange rate)	747

Structure of GDP	1998	1999	2000	2001	2002 <sup>1/</sup>
	(% GDP)				
Industry and Construction, of which:	35.0	39.1	42.5	43.5	45.6
Oil and gas sector	11.5	20.1	30.5	32.0	29.5
Agriculture	18.0	18.2	15.9	14.8	14.2
Other	47.0	42.7	41.5	41.7	40.2
	(% change, unless otherwise indicated)				
Output and Employment					
GDP (in billion mantas)	17,203	18,875	23,591	26,578	29,602
Real GDP	10.0	7.4	11.1	9.9	10.6
Employment	0.2	0.1	0.1	0.3	0.3
Prices and Wages					
Consumer price inflation					
Average	-0.8	-8.5	1.8	1.5	2.8
End of Year	-7.6	-0.5	2.2	1.3	3.3
Average nominal manta wage	18.9	9.5	20.2	17.3	21.2
Real manta wage	19.9	19.7	18.1	15.6	17.9
Average nominal dollar wage	22.5	2.8	10.7	12.7	16.8
Real dollar wage	23.5	12.6	8.7	11.1	13.6
	(\$ million)				
External Sector					
Exports of goods	677.8	1,025.2	1,798.7	2,045.9	2,304.9
Imports of goods	1,723.9	1,433.4	1,539.0	1,465.1	1,823.3
Current account balance	-1,364.5	599.7	-187.3	-49.9	-769.2
Current account balance (% GDP)	-30.7	-13.1	-3.6	0.9	12.6

<sup>1/</sup> Preliminary Data

Source: Azerbaijan State Statistics Committee, Azerbaijan National Bank, Ministry of Finance; and International Monetary Fund staff estimates.

<b>Structure of GDP</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
	(% change, unless otherwise indicated)				
Financial Markets					
Manta reserve money, end of year	-22.3	20.9	22.1	9.0	11.0
Manta broad money, end of year	-10.6	5.3	11.1	7.8	15.5
Manta velocity relative to non- oil GDP <sup>2/</sup>	10.4	10.8	11.7	11.9	11.9
Exchange rate (manta/\$)					
End of year	3,890.0	4,378.0	4,565.0	4,775.0	4,893.0
Average	3,869.0	4,120.2	4,120.2	4,474.2	4,834.0

### **KEY ENVIRONMENTAL PROBLEMS AND ACTION PRIORITIES IDENTIFIED BY THE NATIONAL ENVIRONMENTAL ACTION PLAN**

- Severe pollution damage caused by industries, oil exploration and production, energy, and transport.
- Threat of irreversible collapse of the sturgeon stock triggered by loss of reproductive capacity, pollution, and overfishing.
- Deteriorating water quality, especially of drinking water, both in rural and urban areas, causing increase of waterborne diseases.
- Loss of fertile agricultural land from erosion, salinization, pollution with heavy metals and chemicals, and deteriorating irrigation systems; loss of forestry cover, mainly in war-affected areas; and threats to protected areas leading to losses in biodiversity.
- Damage to the Caspian coastal zone caused by flooding from sea level rise and pollution.

### **Deterioration of the cultural heritage due to natural causes, aggravated by modern environmental problems, such as acid rain and uncontrolled development**

1. Pollution Damage from Industries, Oil Production, Energy, and Transport. These sectors have been a source of severe air, water, and soil pollution in Azerbaijan, particularly in Sumgayit and parts of Baku. The main reasons are outdated technology, malfunctioning or even lack of end-of-pipe pollution abatement equipment, and use of low-quality raw materials that generate high pollution emissions and waste. While pollution decreased as industries declined, there is evidence that per-unit-of-output pollution has increased in many enterprises. Thus, pollution may rapidly increase as a result of industrial recovery if no measures are taken to improve industries' environmental performance.

2. The actions proposed to mitigate industrial damage are based on the country's strategic considerations and include the following: in the industrial sector, upgrading emission monitoring equipment and leak detection capabilities, investing in such modern technologies as compressor stations and condensation systems, and cleanup of critical public health hazards; in the energy sector, investment in new equipment and control devices and introducing new, efficient technologies; in transport, investment in new buses and trucks, restricting passenger car traffic in central Baku, and increasing taxes on leaded fuel.

### **Threat of irreversible loss of sturgeon stocks**

3. The seven species of sturgeon in the Caspian Sea are among the oldest fish species still living on earth. They have very high value as consumption fish, as sources of medicinal products, and, above all, as the source of 90% of all black caviar produced in the world. The natural habitat for spawning sturgeon in rivers largely disappeared during the 1950s with the construction of dams, and sturgeon are currently hatched in some 20 hatcheries in Russia, Kazakhstan, Iran, and Azerbaijan. Many of these hatcheries have been seriously damaged by flood, and unless hatchery production is increased, the sturgeon stocks face extinction. Any strategy to save sturgeon should start with the immediate expansion of hatchery capacities in

the Caspian states because natural reproduction appears to be incapable of maintaining the population under current pressures. In Azerbaijan, the annual production capacity of the existing hatcheries should be increased to 15 million by refurbishing and expanding the facilities. The country must also take steps to strengthen regional cooperation on fisheries management. Fishery laws and regulations should be reviewed and revised to reflect the changing economy, and the appropriate international conventions signed.

### **Water quality**

4. Water resources are critical for the country's economy. Water resources are limited and losses during distribution are high—reaching 50% in agriculture, which accounts for the 70% of the total water usage. Piped drinking water is available to less than 50% of the population and many areas experience drinking water shortages. Steps to protect water quality and improve water resources management should be incorporated into all sectoral strategies. Special attention needs to be given to the drinking water problems because of the general increase in the number of waterborne diseases. In the medium and long term, water resources should be safeguarded through investment in municipal sewage treatment plants along the Kur River and in industrial wastewater purification and recycling systems. Instituting a maintenance program to reduce the losses in the pipe system in urban areas is also a very high priority (it is included in the World Bank's Greater Baku Water Supply Project).

### **Impacts of the rising level of the Caspian Sea**

5. Since 1978, the water level of the sea has risen almost 2.5 meters and extensive flooding damage has occurred along Azerbaijan's coast due to the relative flatness of the terrain and dense coastal development. Fortunately, since 1996, the water level has declined slightly. This has significantly altered the relative order of priority actions in NEAP: protection measures are less urgent and there is some time to develop a coastal zone protection plan before new areas are flooded.

6. Damages that have already been incurred are pervasive with substantial social, environmental, and economic costs. Damage is ongoing in some areas because of wave action and significantly higher groundwater levels. Some 807 km<sup>2</sup> of land have been flooded. An additional 460 km<sup>2</sup> will be flooded if the Caspian rises another 1.5 m—a level that is within the forecasts to 2010.

7. About 50 activities are recommended in order to address existing damage and prevent new damage. The total cost of all these actions could reach several hundred million dollars. The NEAP team developed a framework to prioritize actions, applying the following criteria: (i) extent of social and human impacts; (ii) irreversible loss of natural resources; and (iii) economic impacts. Immediate priorities include: relocation of infrastructure and households in the affected regions of Neftchala, Lankaran, and Astara; prevention of secondary pollution of the sea from oil-related activities; and restoration, relocation, or protection of infrastructure of national importance, such as critical land-based transportation links.

### **Degradation of agricultural land and loss of forestry and biodiversity**

8. About half the country's land resources are being used for agriculture. Some 1.2 million ha are affected by high salinity; many soils are exhausted by years of poor agricultural practices and policies; and many areas are damaged by erosion. Loss of productive land in some locations is resulting in increased pressure on fragile lands and resources in other locations.

Azerbaijan possesses a very diversified flora and fauna, with some species having considerable commercial value. Many of these species are threatened or endangered. The country established a network of 14 strict preserves and 20 state reserves, but they do not include many critical sites and species, and their effectiveness has dramatically decreased due to lack of funds. Forest lands, in particular, are declining at an alarming rate. Many of these land degradation issues have no immediate solution and need to be addressed as part of the long-term restructuring of the various sectors. Some immediate efforts can be made, however, such as establishing appropriate legal directives that define prohibited agrochemicals, banning their importation and storage, and instituting appropriate sanctions. Key international agreements, such as the Convention on Biological Diversity, should be signed in order to access the bilateral funding available to cooperating countries. Funds for management and operation of reserves and parks also need to be increased.

### **Cultural heritage**

9. Azerbaijan has a long prehistory, dating back to the Paleolithic. Many of Azerbaijan's historical sites are in a serious state of disrepair or deterioration, however. Some of the architectural monuments are structurally damaged and unsound. A number of monuments are currently under Armenian control and their condition is uncertain. These sites have survived for enormous periods of time, but natural phenomena, such as wind, rain, and earthquakes are eroding them, aggravated by acid rain, air pollution, and other human-induced environmental problems.

10. The condition of the key cultural and historical sites needs to be assessed and a protection program developed for them. Taking into account the current shortage of funds in the country, this program must be integrated into the framework of ongoing economic development and conservation management plans. Sources of human and economic capital need to be identified for restoration.

**National Environmental Action Plan  
State Committee on Ecology and Control of Natural Resources Utilization  
Baku, 1998**

## WATER, WASTEWATER, AND SANITATION

**Table A3.1: Selected Technical Data on Water and Wastewater Utilities of Secondary Cities and Small Towns**

	Water					Sewerage	
Town name	Source of Water	Design Capacity of Systems ('000 m <sup>3</sup> /year) <sup>1</sup>	Population Served ('000)	Target Level of Service (lpcd) <sup>2</sup>	Availability of Water Treatment Plant <sup>3</sup>	Availability of Sewerage Collection System	Availability and Type of Wastewater Treatment <sup>4</sup>
Agchabedi	7 artesian wells, underground water (Garhar River)	288	26.5	30	NO	NO	NO
Agdash	Turyan River – drainage system, 6 artesian wells	601	24.4	67	NO	YES	OWN
Agstafa	6 artesian wells, underground water	315	10.5	82	NO	YES	NO
Agsu	Girdiman and Agsu rivers, surface water (Girdiman channel)	750	15.3	68	NO	NO	NO
Ali-Bayramli	Kur River through Demiryol channel (treated water)	10,120	62.9	95	NO	YES	NO
Apsheron	ARWC	1,752	35.0	137	NO	YES	BWD
Astara	Astara River, drainage system	500	13.2	29	NO	NO	NO
Balaken	Siltik and Gara rivers, 6 artesian wells	300	8.9	92	NO	NO	NO
Barda	48 artesian wells on Terter River	2,246	32.0	41	NO	NO	NO
Beylagan	2 artesian wells (Mil channel closed due to war)	420	13.2	13	NO	NO	NO

Source: MENR

Town name	Water					Sewerage	
	Source of Water	Design Capacity of Systems ('000 m <sup>3</sup> /year) <sup>1</sup>	Population Served ('000)	Target Level of Service (lpcd) <sup>2</sup>	Availability of Water Treatment Plant <sup>3</sup>	Availability of Sewerage Collection System	Availability and Type of Wastewater Treatment <sup>4</sup>
Bilasuvar	Azizbeyov channel (Araz River)	804	19.7	19	NO	NO	NO
Chalilabad	6 artesian wells	500	27.0	60		NO	NO
Dashkesen	Underground and surface water	500	10.6	40	NO	YES	NO
Devechi	ARWC	1,380	19.8	137	ARWC	NO	NO
Gakh	Gimrikh River, drainage system	450	12.0	64	NO	NO	NO
Ganja	Underground water, 167 artesian wells	20,499	285.6	140	NO	YES	OWN
Gazakh	Agstafa River, drainage system, underground water, 15 artesian wells	1,123	19.6	35	NO	YES	OWN
Gebele	Underground water, Demiraparan River, drainage system, 7 artesian wells	462	13.5	40	NO	NO	NO
Gobustan	Gozlu River, drainage system	65	2.1	95	NO	NO	NO
Guba	Gudnal River, drainage system, underground water, 1 artesian hole	1,267	21.7	75	NO	YES	CANNERY FACTORY
Gusar	Gusar River, drainage system, 2 artesian wells	660	14.8	70	NO	YES	CANNERY FACTORY

Town name	Water					Sewerage	
	Source of Water	Design Capacity of Systems ('000 m <sup>3</sup> /year) <sup>1</sup>	Population Served ('000)	Target Level of Service (lpcd) <sup>2</sup>	Availability of Water Treatment Plant <sup>3</sup>	Availability of Sewerage Collection System	Availability and Type of Wastewater Treatment <sup>4</sup>
Imayilli	Ah-Oh River, drainage system, underground water, 4 artesian wells	252	12.7	82	NO	YES	OWN
Imishli	4 artesian wells	27	775.4	74	NO	NO	NO
Jardimli	Vilesh River, drainage system, 8 artesian wells	196	3.6	31		NO	NO
Jevlakh	Kur River – pumping, 10 artesian wells	428,100	48.1	85	YES	YES	OWN
Kedebey	Underground and surface water	204	7.2	35	NO	NO	NO
Khachikabul	ARWC	1,146	21.8	127	ARWC	NO	NO
Khackmaz	Underground water, Gudman River,, drainage system	1,242	28.7	162		YES	CANNERY FACTORY
Khanlar	Ganja River, drainage system, underground water	694	16.0	110		NO	NO
Khili	Kur River (without treatment)	38	3.6	70	NO	NO	NO
Khizi	Underground water, Samur-Apsheron channel (treatment)	540	6.5	50	YES	NO	NO
Khudat	4 artesian wells	264	11.1	99		NO	NO
Koranboy	Kur River – surface water (treatment), 19 artesian wells	385	6.4	147	YES	NO	NO

Town name	Water					Sewerage	
	Source of Water	Design Capacity of Systems ('000 m <sup>3</sup> /year) <sup>1</sup>	Population Served ('000)	Target Level of Service (lpcd) <sup>2</sup>	Availability of Water Treatment Plant <sup>3</sup>	Availability of Sewerage Collection System	Availability and Type of Wastewater Treatment <sup>4</sup>
Koy-chay	Underground water, 13 artesian wells	1,100	32.5	120	NO	YES	OWN
Kurdamir	Shirvan channel (treatment)	321	15.8	52	YES	YES	OWN
Lenkeran	Bashir River (treatment), 5 artesian wells	1,100	32.5	120	YES	YES	OWN
Lerik	Surface water (Zuvan River)	97	0.5	30	YES	NO	NO
Mingechevir	Kur River (treatment)	19,036	93.3	183	YES	YES	OWN
Naftalan	Underground water, 16 artesian wells	780	8.2	158		YES	OWN
Neftchala	Concession		15.2			YES	NO
Oguz	Underground water	270	5.2	65		NO	NO
Saatli`	Surface water (Araz River)	180	15.0	28		NO	NO
Sabirabad	Kur River	1,801	14.2	186		YES	OWN
Salyan	Kur River (treatment)	1,113	30.9	125	YES	YES	OWN
Samukh	27 artesian wells	500	4.9	50		NO	NO
Shamakhi	Underground water, Pirsaat River – drainage system	443	25.7	26		NO	NO
Sheki	Surface and underground water, 15 artesian wells	4,650	5,805.0	217	YES	YES	OWN
Shamkir	Cheyir River, drainage system,						

	Water					Sewerage	
Town name	Source of Water	Design Capacity of Systems ('000 m <sup>3</sup> /year) <sup>1</sup>	Population Served ('000)	Target Level of Service (lpcd) <sup>2</sup>	Availability of Water Treatment Plant <sup>3</sup>	Availability of Sewerage Collection System	Availability and Type of Wastewater Treatment <sup>4</sup>
	underground water, 6 artesian wells	1,440	29.0	70		NO	NO
Siyazan	ARWC	1,396	19.5	116		YES	OWN
Sumgayit	ARWC	72,267	241.6	340	ARWC	YES	PARTIAL INDUSTRY
Tertter	17 artesian wells	1,100	13.2	94		NO	NO
Tovuz	Underground water, 7 artesian wells	430	13.6	25		YES	NO
Uchar	Uchar and Demiryolu rivers, Shirvan channel	910	15.0	24		NO	NO
Zakatala	Tala River, drainage system, 14 artesian wells	632	18.5	75	NO	YES	OWN
Zerdab	Surface water (Kur River)	253	58.0	9	YES	NO	NO
Zeynalabdin Tagiyev Town	ARWC	3,079	17.0		ARWC	YES	NO
<b>Nakhchivan Republic</b>							
Nakhchivan City		4,830	63.0	77	YES	YES	OWN
Julfa		2,160	36.0	60	YES	YES	OWN

Town name	Water					Sewerage	
	Source of Water	Design Capacity of Systems ('000 m <sup>3</sup> /year) <sup>1</sup>	Population Served ('000)	Target Level of Service (lpcd) <sup>2</sup>	Availability of Water Treatment Plant <sup>3</sup>	Availability of Sewerage Collection System	Availability and Type of Wastewater Treatment <sup>4</sup>
Ordubad		540	41.0	132	NO	NO	NO
Sharur City		565	7.0	81	NO	YES	OWN
Shahbuz		300	20.0	15	NO	NO	NO
Sharur region		200	111.0	2	NO	NO	NO

Notes:

- <sup>1</sup> There is no metering of production and the only information available corresponds to the original capacity of the systems per their original designs. The actual production capacity is in most cases smaller than the stated capacity.
- <sup>2</sup> lpcd = liters per capita per day. This number is usually called consumption per capita. However, the prevalent lack of metering means that this number is actually a target for level of service based on design capacity and population served. As the actual water production is smaller, this target should be seen as a higher limit.
- <sup>3</sup> This column refers only to water treatment plants and not to disinfection facilities. Cells with ARWC indicate that treated water is provided by Apsheron Regional Water Company (ARWC).
- <sup>4</sup> Information on the operational status of treatment plants was not available.

**Table A3.2: Urban and Rural Sanitation, 2000**  
**(Proportion of Households with Toilet Facilities [%])**

<b>Sanitation Type</b>	<b>Urban</b>	<b>Rural</b>	<b>All</b>
Flush to sewage system/septic tank	49.7	0.7	27.0
Poor flush latrine	5.6	0.6	3.3
Improved pit latrine	1.5	0.1	0.8
Traditional pit latrine	33.0	69.0	49.7
Open pit	9.7	29.3	18.8
Bucket	0.1	0.0	0.1
Other	0.3	0.2	0.3
No facility/bush/field	0.1	0.1	0.1
Total	100.0	100.0	100.0
<b>Improved types of sanitation</b>	90	70	81

Source: WHO/UNICEF (2001).

**Table A3.3: Urban and Rural Water, 1995 and 2000  
(Proportion of Households with Water Facilities [%])**

1995					2000			
Water	Baku	Outside Baku	Internally Displaced	Total	Water	Urban	Rural	Total
<i>Number of Households surveyed</i>	408	1,200	408	2,016	<i>Number of persons surveyed</i>	14,517	12,513	27,030
Centralized water system	95.1	37.3	56.5	52.9	Piped into dwelling	52.2	1.3	28.6
Piped natural spring, pump, own system	2.4	7.7	4.4	6.0	Piped into yard or plot	21.5	16.9	19.3
Rain		0.3		0.2	Public tap	10.2	10.2	10.2
Well	1.2	17.0	9.6	12.3	Tube well/borehole with pump	4.9	15.1	9.6
River, lake, pond, spring, canal		27.8	6.9	17.9	Protected dug well	2.7	8.1	5.2
Artesian		5.9	18.4	7.2	Protected spring	1.2	6.0	3.4
Truck, purchased		3.4	3.9	2.8	Rainwater collection	0.0	0.0	0.0
Other, neighbors	1.0	0.5	0.3	0.6	Bottled water	0.2	0.4	0.3
No water	0.3	0.1		0.1	Unprotected dug well	0.1	5.2	2.5
					Pond, river or stream	0.9	17.4	8.6
					Tanker, truck, vendor	4.0	6.5	5.2
<b>Total</b>	100.0	100.0	100.0	100.0	<b>Total</b>	100.0	100.0	100.0
Estimated proportion of protected wells	1.2	10.4	5.8	8.3	Proportion of wells that are protected	96	61	68
Estimated proportion of protected artesian sources	0.0	2.2	7.0	2.9	Proportion of springs that are protected	60	38	40
<b>Improved drinking water source, including 67% of wells and artesian sources</b>	<b>99</b>	<b>58</b>	<b>74</b>	<b>70</b>	<b>Improved drinking water source</b>	<b>93</b>	<b>58</b>	<b>76</b>

Source: World Bank (1995).

**LAWS ON THE ENVIRONMENT AND WATER MANAGEMENT\***

<b>No</b>	<b>Name in Force</b>	<b>Date in Force</b>	<b>Last Amendment</b>
1	Water Code	17/03/1998	–
2	Law on Environmental Protection	10/08/1999	30/03/2001
3	Law on Environmental Safety	14/08/1999	–
4	Law on Amelioration and Irrigation	26/09/1996	–
5	Law on Water Supply and Wastewater	31/01/2000	–
6	Law on Hydrometeorological Activities	25/08/1998	–
7	Law on Underground Resources	13/02/1998	01/12/2001
8	Law on Protection of Atmospheric Air	22/06/2001	–
9	Forest Code	03/03/1998	–
10	Law on Plant Protection	30/02/1997	–
11	Law on Plant Quarantine	12/07/1996	07/02/1998
12	Law on Fauna	08/08/1999	–
13	Law on Fishing and Fish Farming	24/06/1998	–
14	Law on Specially Protected Natural Territories and Objects	15/07/2000	–
15	Law on Domestic Wastes	28/10/1998	–
16	Law on Radiation Safety	01/04/1998	01/12/2001
17	Law on Obligatory Ecological Insurance	21/04/2002	–
18	Law on Public Data on Environment	20/04/2002	–
19	Law on Population Health	31/07/1997	–
20	Law on Sanitary-Hygienic State	10/11/1992	20/02/2001
21	Law on Land Code	08/08/1999	–
22	Law on Pesticides and Agricultural Chemicals	02/08/1997	–
23	Law on Geodesy and Cartography	22/07/1998	–
24	Law on State Borders	09/12/1991	–
25	Law on Utilization of Energy Resources	20/11/1996	–
26	Law on Energy	02/02/1999	–
27	Law on Electro Energy	14/06/1998	–
28	Law on Electric and Thermal Power Plants	11/03/2000	–
29	Law on Gas Supply	29/09/1998	–
30	Law on Technical Safety	02/02/2000	–
31	Law on Major Town Planning	05/09/1999	–
32	Law on Architecture	20/06/1998	–
33	Law on Natural Monopoly	13/03/1999	–
34	Law on Standardization	27/09/1996	–
35	Tax Code	01/01/2001	–
36	Law on State Land Cadastre, Land Monitoring, and Land Arrangement	22/12/1998	No data
37	Law on Environmental Education	10/12/2002	No data
38	Law on Health Protection	02/04/1999	No data
39	Law on Land Fertility	30/12/1999	No data
40	Law on Grain	16/06/2000	No data

\* This Table was prepared by Development Alternatives, Inc. for the Water Management in South Caucasus project.

– = no amendments

### CHANGES AND ADDITIONS TO THE ENVIRONMENTAL LAWS

No.	Name	Date	Responsible Authority
5335	Changes and additions to certain laws in connection with application of the law on obtaining information relevant to the environment	25/03/2003	National Assembly of the Azerbaijan Republic
5266	Addition to the law on specially protected natural territories and objects	3/12/2002	National Assembly of the Azerbaijan Republic
4427	Decree on the application of the law on obligatory environmental insurance	18/04/2002	President of the Azerbaijan Republic
3956	Decree on state regulation of import-export activities connected with ozone-destroying substances	21/12/2001	President of the Azerbaijan Republic
4417	Changes and additions in some legislative acts in connection with application of the law on fishing	05/10/2001	National Assembly of the Azerbaijan Republic
3371	Changes and additions to some legal acts in connection with application of the law on civil defense	27/02/2001	National Assembly of the Azerbaijan Republic
3404	Amendments and supplements to some legal acts in connection with application of the law on private medical activity	20/02/2001	National Assembly of the Azerbaijan Republic
3402	Changes and additions to some legal acts in connection with application of the law on preventive measures for immunity against infectious diseases	20/02/2001	National Assembly of the Azerbaijan Republic
3403	Amendments and supplements to some legal acts in connection with application of the law on transplantation of human organs	02/20/2001	National Assembly of the Azerbaijan Republic
3374	Changes and additions to some legal acts in connection with application of the law on combating tuberculosis in the Azerbaijan Republic	02/20/2001	National Assembly of the Azerbaijan Republic
3051	Decree on application of the law on environment protection	30/08/2000	President of the Azerbaijan Republic

No.	Name	Date	Responsible Authority
2889	Decree on application of the law on specially protected natural territories and objects	15/07/2000	President of the Azerbaijan Republic
2887	Amendments and supplements to some legislative acts concerning the application of the law on environmental protection	16/05/2000	National Assembly of the Azerbaijan Republic
2265	Decree on application of the law on fertility of lands	06/03/2000	President of the Azerbaijan Republic
1922	Decree No. 173 on application of the law on environment protection	04/08/1999	President of the Azerbaijan Republic
1920	Decree No. 172 on application of the law on ecological security	04/08/1999	President of the Azerbaijan Republic
1569	Decree on application of the law on state land cadastre, land monitoring, and land arrangement	12/03/1999	President of the Azerbaijan Republic

**ACTION PLAN ON DEVELOPMENT OF ECONOMIC REGIONS OF AZERBAIJAN, 2004–2008**  
**Actions Related to Urban Environment**

<b>5.1 Main Macroeconomic Policy Measures</b>				
<b>N</b>	<b>Measures</b>	<b>Implementation Period</b>	<b>Implementing Agencies</b>	<b>Aim of Measure</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
5.1.5	Direct state investments for improvement of infrastructure and utility service supply, and construction of social buildings	2004–2008	Ministry of Economic Development	To improve infrastructure and utility service supply to regions
5.1.7	Speed up the privatization process in regions	2004–2008	Ministry of Economic Development	To restore the activity of enterprises
<b>5.2 Other Measures Aimed at Development of Regions</b>				
5.2.16	Raise utility services, as well as electricity, water, gas, communication, etc., to a level of modern standards, and implement restructuring activities in this sector, especially for the rural population	2004–2008	Ministry of Economic Development, appropriate organizations	To improve utility and other services, especially for rural populations
<b>5.3 Measures to be Implemented in Economic Regions</b>				
<b>Baku-Apsheron economic region (excluding Baku)</b>				
5.3.1.3	Restore water supply and sewerage systems of settlements	2004–2008	Ministry of Economic Development, State Construction and Architecture Committee, Ministry of Finance, local executive agencies, and municipalities	To improve quality of utility services
5.3.1.4	Supply settlements with gas	2004–2008	Ministry of Fuel and Energy, Ministry of Economic Development, Azerenergy Joint Stock Company (JSC), Azerigas JSC, local executive agencies	To improve gas supply for the population

Source: Ministry of Economic Development, Action Plan on Development of Economic Regions of Azerbaijan, 2004–2008.

<b>N</b>	<b>Measures</b>	<b>Implementation Period</b>	<b>Implementing Agencies</b>	<b>Aim of Measure</b>
5.3.2.4	Restore water supply and sewerage systems of settlements	2004–2008	Ministry of Economic Development, State Construction and Architecture Committee, Ministry of Finance, local executive agencies, and municipalities	To improve quality of utility services
<b>Ganja town</b>				
5.3.2.21	Reconstruct water supply and sewerage systems of town	2004–2008	Ministry of Economic Development	Provision of adequate potable water
<b>Shamkir rayon</b>				
5.3.2.38	Build water line in Shamkir	2004–2005	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water
<b>Sheki-Zagatala economic region</b>				
5.3.3.2	Construction of Oguz-Gebele-Baku water line	2004–2005	Ministry of Economic Development, Ministry of Finance	Provision of adequate potable water
5.3.3.3	Restore water supply and sewerage systems of settlements	2004–2008	Ministry of Economic Development, State Construction and Architecture Committee, Ministry of Finance, local executive agencies, and municipalities	To improve quality of utility services
<b>Oghuz rayon</b>				
5.3.3.33	Build water line in city and some villages of Oghuz	2004–2006	Ministry of Economic Development, Ministry of Finance	Provision of adequate potable water

N	Measures	Implementation Period	Implementing Agencies	Aim of Measure
<b>Sheki Rayon</b>				
5.3.3.43	Restore water supply and sewerage systems in Sheki	2004–2007	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water and improving sewerage system
<b>Zagatala rayon</b>				
5.3.3.51	Restore water supply and sewerage systems in Zagatala region	2004–2006	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water and improving sewerage system
<b>Lankaran-Astara economic region</b>				
5.3.4.4	Developing a water supply and wastewater system for household settlements	2004–2008	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power, and municipal bodies	
<b>Jalilabad rayon</b>				
5.3.4.18	Restructuring city water supply and wastewater system	2004–2006	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water
<b>Lankaran City</b>				
5.3.4.33	Restructuring water supply and wastewater system	2004–2007	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water and improving wastewater services

N	Measures	Implementation Period	Implementing Agencies	Aim of Measure
<b>Guba-Khachmaz economic region</b>				
5.3.5.4	Rehabilitation of water supply and wastewater system of household settlements	2004–2008	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Improved quality of utility services
<b>Guba rayon</b>				
5.3.5.28	Construction of a water pipeline to Guba rayon	2004–2007	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power, and municipal bodies	Provision of adequate potable water
<b>Aran economic region</b>				
5.3.6.6	Rehabilitation of water supply and wastewater systems of household settlements	2004–2008	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power, and municipal bodies	Further improvements in the quality of utility services
<b>Mingechevir City</b>				
5.3.6.14	Reconstruction of the water lines in Mingechevir City	2004–2005	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power and municipal bodies	Improvement of the potable water supply

N	Measures	Implementation Period	Implementing Agencies	Aim of Measure
<b>Yevlakh City</b>				
5.3.6.18	Reconstruction of the Yevlakh waterline	2005–2006	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power, and municipal bodies	Improvement of the potable water supply
<b>Aghdash rayon</b>				
5.3.6.29	Reconstruction of the water supply and sewerage system in Aghdash City	2004–2007	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water and improvement of the sewerage system
<b>Bilasuvar rayon</b>				
5.3.6.46	Construction of a water line	2004–2005	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power, and municipal bodies	Improvement of the potable water supply
<b>Goychay rayon</b>				
5.3.6.52	Reestablishment of the water supply and sewerage system	2004–2007	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water and improvement of the sewerage system
<b>Salyan rayon</b>				
5.3.6.86	Reconstruction of the water supply and sewerage system	2004–2005	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power, and municipal bodies	Improvement in public utilities

N	Measures	Implementation Period	Implementing Agencies	Aim of Measure
<b>Shirvan highland economic region</b>				
5.3.7.2	Rehabilitation of the water supply and sewerage system in settlements	2004–2008	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power, and municipal bodies	Improvement in public utilities
<b>Khobustan rayon</b>				
5.3.7.20	Improvement of the water supply	2004–2007	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water
<b>Shamakhi rayon</b>				
5.3.7.28	Improvement of the water supply system in a number of settlements	2004–2008	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee	Provision of adequate potable water
<b>Nakhchivan economic region</b>				
5.3.8.5	Reestablishment of water supply and sewerage system in Nakhchivan City	2004–2008	Ministry of Economic Development, Ministry of Finance, State Construction and Architecture Committee, local executive power body	Provision of adequate potable water and improvement of the sewerage system

## **DECREE OF THE PRESIDENT OF AZERBAIJAN ON MEASURES TO ACCELERATE SOCIAL AND ECONOMIC DEVELOPMENT**

26 November 2003

The resolute and purposeful measures undertaken in Azerbaijan in 1993–1995 under the leadership of President Heydar Aliyev put an end to the arbitrariness and chaos that prevailed in the country, ensured social and political stability, and created favorable conditions for comprehensive development of the country and its integration into the international economic system. Due to the reforms successively carried out since 1995, considerable progress has been achieved in the development of the economy, including economic growth and laying the foundation for and development of entrepreneurship to play a decisive role in realizing economic potential. Also, important steps have been taken to improve the welfare of the population, through increased state attention to the people's needs for social protection. Over the last 5 years, gross domestic product (GDP) has increased by 60%, investments 2.8-fold, and average salary 2.2-fold. During this period, the state budgeted deficit has not exceeded 2.0% and the inflation rate 2.5%. The share of the private sector in GDP increased from 59.5% in 1998 to 73.0% in 2003, of which the industrial share rose from 26% to 54%. Today, more than 10 state programs are being implemented to provide comprehensive solutions to existing problems.

For more effective use of oil revenues that are growing every year due to the successful oil industry, the State Oil Fund of the Azerbaijan Republic has been founded in the country. So far, more than \$800 million have accumulated in the Fund. This resource is used for realization of social and economic projects of paramount importance to the country.

The Baku-Tbilisi-Ceyhan construction works and implementation of the "Shahdaniz" project are continuing successfully.

The progress demonstrated above has created a reliable foundation for Azerbaijan to become an economically strong State, to be integrated into the global economic system as a worthy member of the system, and to solve social problems toward further improvement of the population's well-being.

For the purpose of reinforcing and further developing the positive trends observed in the economy, and acceleration of solutions to problems existing in the social sphere, I hereby decree:

1. The Cabinet of Ministers of the Republic of Azerbaijan in collaboration with related state bodies shall be assigned to
  - intensify control over the continuation of the dynamic socioeconomic developments achieved in the country, undertake relevant measures aimed at timely elimination of the problems existing in this sphere, and submit a report on the work done to the President of the Republic of Azerbaijan twice a year;
  - study the course of implementation of state programs adopted in recent years to develop various fields of the economy (development of small and medium entrepreneurship in the Republic of Azerbaijan for 2002–2005, poverty reduction and economic development in the Republic of Azerbaijan for 2003–2005, application of the norms foreseen in the European social charter, development of tourism in the Republic of Azerbaijan for 2003–2005,

ecologically stable socioeconomic development in the Republic of Azerbaijan, and other programs), ensure that the measures envisaged in the mentioned programs are taken in a timely manner, and inform the President of the Republic of Azerbaijan on the work done;

- prepare within one month and submit to the President of the Republic of Azerbaijan a plan of action to reduce unemployment in the country and to increase employment opportunities, particularly in useful work for young people;
- prepare within one month and submit to the President of the Republic of Azerbaijan for approval a special state program to construct new temporary settlements and houses for refugees and displaced people in encampments, and to improve their living conditions and employment opportunities;
- draw up within a month and submit to the President of the Republic of Azerbaijan projects in the relevant state programs on socioeconomic development of the regions, taking into consideration local resources and other factors;
- prepare and submit to the President of the Republic of Azerbaijan relevant proposals on use and development of alternative energy resources that are in global use (solar energy, wind energy, hydrothermal energy, and small hydroelectric stations);
- carry out work for speedy development of the non-oil sector to achieve balanced economic progress, take purposeful measures to stimulate investment in this sphere, and inform the President of the Republic of Azerbaijan of the results every quarter;
- take measures to encourage manufacturers to meet international standards and export their products to world markets;
- prepare and take measures to ensure the manufacturing and importation of high-quality products and medicines (including strengthening quality control procedures) to protect the health of the population;
- prepare within one month and submit to the President of the Republic of Azerbaijan proposals to launch the second phase of reforms in the agrarian sector and accelerate taking the necessary measures (organization of technical service centers, provision of more equipment to farmers, development of seed nurseries, creation of new processing enterprises, etc.);
- submit within one month to the President of the Republic of Azerbaijan proposals related to completion of the reforms in the economic management system, including improvement of the structure of the Cabinet of Ministers of the Republic of Azerbaijan and specifying tasks and authorities in executive bodies;
- prepare and submit within two months to the President of the Republic of Azerbaijan proposals on long-term strategy on control over revenues from the oil and gas industry;
- take measures to ensure optimum use of funds allocated to budget expenditures from the State Oil Fund so they remain transparent;

- prepare within one month and submit to the President of the Republic of Azerbaijan relevant proposals on reinforcing financial discipline in state establishments, increasing state income, and improving effectiveness of expenditures;
- prepare and submit within two months to the President of the Republic of Azerbaijan proposals on improving the structure of budget expenditures;
- carry out work toward improving the salary and stipends system in order to improve the living standard of the population, and submit to the President of the Republic of Azerbaijan relevant proposals in the second half of 2004;
- draw up and submit within two months to the President of the Republic of Azerbaijan a new draft law on provision of citizens' pensions;
- prepare and submit within two months to the President of the Republic of Azerbaijan a mechanism for conducting municipal reforms in the country jointly with relevant state bodies.

2. The Cabinet of Ministers of the Republic of Azerbaijan in collaboration with the Ministry of Education of the Republic of Azerbaijan, the Ministry of Health of the Republic of Azerbaijan, the Ministry of Culture of the Republic of Azerbaijan, and other state bodies shall speed up reforms in the social sector and prepare appropriate measures aimed at radical improvement of social services to the population and elimination of existing shortcomings, and regularly inform the President of the Republic of Azerbaijan on the work done.

3. The Ministry of Economic Development shall be assigned to

- speed up implementation of the resolutions adopted earlier on development of entrepreneurship, take relevant measures under the legislation to eliminate obstacles, and regularly inform the President of the Republic of Azerbaijan on the work done.
- speed up privatization of state-owned enterprises that are open for privatization in accordance with the second State Program of Privatization of the State Property, and submit relevant proposals to the President of the Republic of Azerbaijan with one month.
- take necessary measures within the legislative framework to restrict monopolist activity and to suppress unfair competition;
- prepare, in collaboration with the National Bank of the Republic of Azerbaijan, a proposal to improve the security of credit given to entrepreneurs to meet their demand for financial resources and submit it to the President of the Republic of Azerbaijan with one month.
- ensure that strategic actions are taken to further expand the country's cooperation with international and regional financial and economic agencies.

4. The Ministry of Finance of the Republic of Azerbaijan shall be assigned to

- intensify control over use of funds of the state budget and purchases using state funds, and take appropriate measures within the legislative framework against organizations financed from the budget that break financial discipline;

- speed up preparation of the scientifically based standards for drawing up the state budget and submit proposals on improvement of the budget system in accordance with modern requirements to the President of the Republic of Azerbaijan within two months;

5. Heads of state enterprises, companies, joint stock companies, and other organizations shall be assigned to reinforce financial discipline, eliminate existing shortcomings, prepare and implement concrete actions to solve problems of nonpayment; and update the Cabinet of Ministers quarterly on the work done.

The Cabinet of Ministers of the Republic of Azerbaijan shall exert constant control over these matters, study the existing situation, and take appropriate measures; and inform the President of the Republic of Azerbaijan quarterly on the results.

6. The National Bank of the Republic of Azerbaijan shall prepare and submit within a month to the President of the Republic of Azerbaijan proposals to speed up reforms in the banking system and to improve banking services.

7. The heads of the central and local executive bodies shall ensure that citizens are treated in accordance with office schedules; that citizens' appeals, applications, and complaints are considered in a timely manner; that responses are made to citizens' demands; and that necessary measures are taken to improve administrative discipline in the relevant executive bodies.

8. The present Decree comes into effect on the day of signing.